Thankful Feelings, Thoughts & Behavior: A Tripartite Model of Evaluating Benefactors and Benefits

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THANKFUL FEELINGS, THOUGHTS & BEHAVIOR:
A TRIPARTITE MODEL OF EVALUATING BENEFACCTORS AND BENEFITS

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

by

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Gratitude and indebtedness have been treated as similar constructs that occur in social exchange, but little work has examined how these constructs are independent from each other. Relatedly, how a person evaluates the components of a social exchange – the benefactor and benefit – can vary. Two exploratory studies examined affective, cognitive and behavioral measurement during a social exchange to test whether they were associated with gratitude and indebtedness. Participants completed a distribution game for which they gave and received tickets for a raffle with a fictitious partner. Study 1 (N=34) findings indicated that gratitude was associated with positive affect, but that positive affect was a better predictor of exchange behavior. Indebtedness was more closely associated with
cognition and was not a significant predictor of exchange behavior. Positive affect and
positive thought were associated with a positive attitude toward the exchange partner,
whereas positive thought alone was associated with a positive attitude toward the benefit
(i.e., raffle tickets). Study 2 (N=60) used a between-subjects variable to see if a
manipulation involving the benefit affected responses. Three conditions were used:
gratitude, indebtedness, or control. Participants in the gratitude and indebtedness
conditions evaluated the partner and the tickets more positively compared to a control
condition. Gratitude is directly associated with positive affect and inversely associated
with negative cognition, whereas indebtedness is directly associated with positive affect
across the three conditions. Three components of attitude were associated with the overall
evaluation of the benefactor across conditions. In contrast, affect and cognition alone
provided the best model for predicting overall evaluation of the benefit. Despite some of
the limitations of this study (e.g., sample size), preliminary evidence suggests associations
between affective and cognitive components and social exchange behavior. Limitations
stemming from partial online data collection are described and discussed.
Chapter 1

Introduction

Imagine a world in which there are no gifts at birthday parties, no random acts of kindness, and no helping hands in times of need; social life would not be the same without giving and receiving benefits. Even many of our most mundane, day-to-day functions rely on our ability to give and take with a whole host of people – people we know and trust to complete strangers. It seems, therefore, that understanding how people give and receive benefits is fundamental to the study of human behavior.

Understanding how people give and receive benefits falls under the category of what researchers and theorists call social exchange. Social exchange is defined as an interaction that involves a benefactor providing a benefit to another party with the condition that the benefit will be reciprocated (Cosmides, 1985; Cosmides & Tooby, 1996; Cosmides & Tooby, 2005). A simple trip to the grocery store illustrates: I can use my resources (money) for a different resource (bag of food). In a similar vein, we also feel the tug to reciprocate in our relationships with others: If friends invite us to dinner at their house, we feel the desire to somehow reciprocate or repay this good gesture in the future. This type of social exchange is often characterized as reciprocal altruism (Trivers, 1971), which Cosmides & Tooby (2005) refer to as “...implicit, deferred cases of exchange” (p.
As elucidated by Cialdini (2008), reciprocity is one of the most basic routes to persuading other people – by giving a favor or help, you have influenced a person’s future actions to in some way return the favor or help. Thus, the concept of giving and receiving resources is not just pertinent to exchanges and reciprocation of goods and services, but it is a key motivation behind persuading people.

More so, many scientists within and outside of the social science community have emphasized the functional importance of social exchange in human history, and many scholars point to this principle as a core property to all human societies and cultures (Cosmides & Tooby, 2005; Gouldner, 1960). For example, social exchange is a necessary component of group formation; it addresses the process of equitable exchanges and dependencies on others to provide us with necessary benefits for survival (Ridley, 1997). Division of labor would not work if there was no sense of rightful exchange between two parties; learning to share and exchange goods and services allows for people to maximize benefits with less effort. If you are a shoemaker, but not a bread baker, this poses a problem for how you will provide bread for yourself and your family. However, if you can exchange shoes for bread, then this issue of not having bread is solved without having to learn to bake bread. Social exchange is, therefore, a functional process in advancing human culture and society.

How does the beneficiary communicate to the benefactor that the benefit is valued, and thus will reciprocate in the future? Not all communications are expressed outwardly to the benefactor, as recognition of a benefit in kind may be simply remembered better or experienced privately. A couple of different responses, however, have been proposed as
potential outward signals of future repayment: gratitude and indebtedness. Trivers (1971) suggested that gratitude (and sympathy) functioned as regulatory mechanisms to indicate that one is establishing trust with a non-kin exchange partner. These people who could successfully navigate situations involving social exchange increased their chances of receiving and giving help in the future, and this contributed to reproductive success. In a similar vein, indebtedness has been explained as the fabric of social exchange, and that “tit for tat” giving and receiving also helps create division of labor and market exchange (Ridley, 1997).

Both gratitude and indebtedness seem to be appropriate responses to those who help us: as stated, they are not opposing responses. Both responses may contribute to our overall evaluation of the benefactor or the benefit given, and thus may be associated with components of attitude (Fazio, 2007). Gratitude and indebtedness are intertwined in our attitudes toward those who offer help, give gifts, and provide us with benefits. Thus it may not be the case that gratitude and indebtedness are separate responses, but are different components of the overall evaluation of the benefactor. The purpose of this dissertation is to explain differences between gratitude and indebtedness by using a model of attitudes that distinguishes between beliefs, emotions, and behavior (Breckler, 1984; Ostrom, 1968; Zanna & Rempel, 1988). Specifically, I propose that gratitude is part of our expressed feelings toward benefactors and benefits, whereas indebtedness is a part of our expressed thoughts toward a benefactor or benefit. The third component of the model is behavior – namely our previous experiences in giving and receiving benefits, and these components will individually and collectively predict attitudes toward benefactors.
Gratitude

Gratitude is a positive emotion, a disposition, an emotional response to benefits received, and a “moral barometer” that keeps us aware of those who treat us well (McCullough, Emmons, & Tsang, 2002; McCullough, Tsang, & Emmons, 2004). This description is similar to descriptions of self-evaluations, such as Baumeister & Leary's (1995) sociometer theory of self-esteem. The sociometer explanation of self-esteem posits that people have an internal monitor that tells us when we have been accepted or rejected socially. This is important because humans are motivated by the desire to belong (Baumeister & Leary, 1995). This internal monitor, self-esteem, acts as a barometer of feedback from others; our barometer decreases or increases with their respective rejection or inclusion. In a similar vein, gratitude may function as a moral barometer of others, rather than self; receipt of benefits or kindness may create changes in one's moral sensor, thus eliciting increases in gratitude. This conceptualization also corresponds to domain-specific sociometers – we have different regulators of inclusiveness for different domains of social importance (Kirkpatrick & Ellis, 2001). Moral barometers, such as gratitude, may function as adaptive mechanisms that signal a social connection with the benefactor based on moral elevation: feeling large amounts of gratitude might indicate belonging with the benefactor, while feeling small amounts of gratitude toward a benefactor may indicate deficiencies in the relationship or with the beneficiary's self-concept. This explanation, in part, might be why moral barometers such as gratitude can be indicators of subjective well-being and feelings of closeness with others (Watkins, 2004; Watkins, et al., 2003).
McCullough and colleagues (2002) also suggest that gratitude is an affective trait or disposition which they define as “a generalized tendency to recognize and respond with grateful emotion to the roles of other people’s benevolence in the positive experiences and outcomes that one obtains” (p. 112). In the moral barometer language, different people have different moral barometer set-points. Gratitude as an affective trait has been associated with a variety of other personality characteristics. Gratitude has been positively associated with well-being, agreeableness, openness to experience, prosocial behavior, spirituality, forgiveness, and approach motivation. In contrast, gratitude is negatively associated with envy, materialism, social anxiety, and negative affect (McCullough, et al., 2002; Mathews & Green, in press; Watkins, et al., 2006). Based on these general findings, gratitude also seems to be a meaningful individual difference and is interrelated with other prosocial characteristics.

Embedded within the definition of gratitude is the idea that one attributes happiness and positive outcomes to external sources in addition to internal ones (Weiner, 1986). Thus, the emotion of gratitude is distinct from primitive affect in that emotion involves an appraisal of what is responsible for the feeling (Weiner, 1986). In gratitude’s case, rather than simply noting one’s efforts or responsibility in gaining positive outcomes, a person who feels gratitude notes the efforts of others in one’s successes. In addition, and following Rosenberg’s hierarchical model of affective experiences (1998), grateful mood is heightened by increased day-to-day experiences of grateful affect and vice-versa, suggesting that gratitude is a result of both top-down and bottom-up effects of traits, mood, and emotion (McCullough, et al., 2004).
How and why is it that gratitude works in this way? How does the functional explanation of gratitude map onto social situations that people encounter on a day-to-day basis? The “commitment problem” (Frank, 1988) offers some insight as to “why” gratitude may be an important part of social exchange evaluations.

*The “Commitment Problem”*

Imagine that you own a small restaurant. You have a few employees, all of whom you need to trust and cooperate with in order to be successful. If one of these employees steals foodstuff or money from you, you will fire the employee and probably seek some form of legal action. Forms of cheating are often met with punishment. Thus, there is a cost to cheat. Equally so, however, there is a cost to punish. In many cases, the cost of punishing a thieving employee is much greater than the actual cost of the offense taken (e.g., $100 worth of food stolen compared to $500 in legal fees). It seems then if self-interest was the driving factor for cooperative behavior, then as a restaurant owner, the cost to sue outweighs the cost incurred by the thief employee and therefore, as the owner of the restaurant, you should elect not to pursue legal action. However, if there was some overriding factor that would indicate that you would sue and act in a non self-interested fashion, then the thief has to seriously consider the consequences of stealing your food and money. Frank (1988) suggests that emotions serve as this overriding factor and act as “commitment devices.” That is, an emotional display can communicate to people that you are playing by the rules of cooperation and expect the same. If your thieving employee decides to go ahead and steal, emotions (in this case anger) will override your self-interest (e.g., just lose the food and money) and will pursue legal action (e.g., incur legal fees in
addition to losing the food and money). Emotions serve as devices or signals in situations that predispose people to act contrary to short-term, material self-interest (Bartlett & DeSteno, 2006; Frank, 1988). The outcome of such an event is that other people see this interaction. Thus, rewards and social benefits (e.g., reputation) of expressing an emotion may be more valuable at a later date, and our social value increases in the eyes of others if we are able to display the according emotions. Interpersonally, gratitude may act as a moral barometer by indicating to others that we acknowledge their kind act. Our moral value (i.e., moral barometer), in a sense, may increase by not only causing gratitude in others but by also expressing it toward others.

How does gratitude specifically work as a commitment device? “Gratefulness is a positive emotional reward associated with encountering cooperation in others in situations where cheating was indeed possible,” (Boyer, 2001, p. 187). In other words, it acknowledges that some sort of resource was shared when that wasn't necessary. Because of its rewarding qualities to the benefactor, gratitude implies that the beneficiary will remember this cooperative effort. Communicating to a benefactor that we are thankful functions as a barometer of not only the benefactor's behavior, but of our own. In essence, by expressing gratitude, the benefactor's social value increases because of the kind act and the beneficiary's social value increases because she is communicating she understands the goodness of the benefactor's act.

Also, gratitude helps broaden our social repertoire (Fredrickson, 1998; 2001; 2004), and leads individuals to act in ways that promote cooperation and future moral behavior (Frank, 1988). “Broadening and building” our social repertoire means that rather than
focusing on narrow problems, positive emotions expand our behavioral options for social problems that we encounter. That is, gratitude may promote the likelihood that one simply does not repay a benefit in a “tit for tat” fashion (e.g., you give me help with three problems on a homework assignment, therefore I give you help with three problems on a homework assignment in the future). Instead, gratitude leads to a variety of different actions that one could take and makes one more willing to explore those possibilities (Fredrickson, 1998; 2001). Therefore, future repayment would not have to be “tit for tat,” but that could be an expression of one's felt thankfulness and, in part, novelty. Indeed, correlational data suggest that gratitude is positively associated with approach motivation and unrelated to avoidance motivation (Watkins, et al., 2006). Participants reported gratitude is related to the desire to engage in relationships and interactions with others, whereas indebtedness has the quality of wanting to avoid situations in which reciprocity will be required for the relationship (Watkins, et al., 2006).

It seems that in the short-term, gratitude can work to build a bond between benefactor and beneficiary. However, there may be relevant long-term advantages to cooperating in social exchanges. Importantly it has been shown that people who are able to make costly long-term investments to close others live longer (Brown, Nesse, Vinokur, & Smith, 2003). Linking back to Frank’s “commitment problem,” those who are able to forgo short-term advantages may reap the benefits of more robust and meaningful long-term advantages by cooperating and investing in others. Individuals who are given a dose of the neuropeptide oxytocin trust partners more in investment situations (Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005; Zak, Kurzban, & Matzner, 2005). Oxytocin is known as a
hormone that creates bonding; it plays a pivotal role in behavior regulation in such behaviors as pair bonding, maternal care and sexual behavior (Carter, 1998; Uvnas-Moberg, 1998). Participants administered oxytocin transferred more resource to their trustees than a placebo group (Zak, et al., 2005). The link between being able to make a long-term investment and longevity may be the expression of positive emotions such as gratitude (Cohn & Fredrickson, 2006). Specifically, positive emotions may reduce the stress related to making such an investment: positive emotions mitigate the effects of negative emotions (Tugade & Fredrickson, 2005) and quickly return cardiovascular activity back to baseline (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000). I suggest that gratitude, serving as an emotional commitment device, communicates to both giver and receiver the commitment to each other and the investment of the benefit bestowed. Thus, gratitude should buffer against anxiety and stress felt between benefactor and beneficiary during a social exchange. That is, if gratitude is present, there is less concern that one will be duped.

It makes sense that we would be able to express gratitude to those with whom we are close, but some of the advantages of gratitude extend beyond our immediate social circle. Much of this evidence suggests that the adaptive nature of gratitude involves expressing to non-kin benefactors that, in the future, reciprocity for kindness will be granted (McCullough, Kimeldorf, & Cohen, 2008). That is, the emotion of gratitude communicates to non-relative benefactors our good faith that we acknowledge and value their effort, and thus will remember this in the future should they need the kindness in return. McCullough and colleagues (2008) also suggest the intriguing notion that gratitude
might encourage “pay it forward” giving: if we are the recipient of benefits, we are likely to share in our bounty with third-parties, not just the initial benefactor. In this respect, gratitude not only functions as an emotional tie to people we are already close, but to our social network and community at large.

Antecedents & Consequences of Gratitude

Experimental studies have shown that gratitude increases when a benefactor has benevolent intentions (Tsang, 2006; Watkins, et al., 2006) and that grateful emotion increases daily well-being (McCullough, et al., 2002). In short, grateful emotion is linked to feeling positive about self and others both at the dispositional and situational level. Specifically, gratitude occurs when a recipient of a gift evaluates three basic dimensions of the gift or benefactor: value, cost, and beneficence (Tesser, Gatewood, & Driver, 1968; Tsang, 2007). Value is how useful or important the benefit is to the recipient. Cost is how much effort or resource was required of the benefactor to provide the benefit. And third, the beneficence of the gift refers to the kind motivations in giving the benefit. The more valuable, costly, and benevolent a gift is perceived to have, the more gratitude is felt. This original thesis by Tesser and colleagues was offered in 1968, but researchers are just currently beginning to examine these three antecedents of a grateful response. For example, a recent study conducted by Tsang (2007) found that ‘in which a more costly favor ($100 raffle ticket) resulted in significantly more gratitude than a small favor ($10 raffle ticket). A different variation of investigating cost was explored by Bartlett & DeSteno (2006): it was shown that feeling grateful toward a benefactor increased the likelihood that one would help the benefactor, even in a costly situation.
Despite the recent interest in gratitude as a research topic, there are still many questions unanswered, including questions about the basic psychological mechanisms involved in the formation of gratitude. An area that has received little attention focuses on how gratitude might be distinct from other constructs, particularly indebtedness. It seems logical that some situations promote increases in gratitude and decreases in indebtedness (or vice versa), while other situations might, to a greater or lesser extent, only affect gratitude or indebtedness. When someone gives me a gift, my basic response would be to thank this benefactor, thus reflecting a grateful response. However, say this gift was given to me on my birthday. When my benefactor’s birthday approaches on the calendar, what will motivate me to reciprocate? Is it simply the good feeling I had when my benefactor gave me the gift, or is it also based on my beliefs or reasoning that I ought to repay – that I am indebted to this person? While there are qualitatively different types of benefactors and benefits that could moderate my desire to reciprocate, the first step is to understand these basic mechanisms (gratitude and indebtedness) and their differences.

**Indebtedness**

Another type of response that can follow the receipt of a benefit is indebtedness (Greenberg, 1980). Heider (1958) says that indebtedness is an acknowledgement that benefits ought to be repaid. When people receive aid, the norm of reciprocity dictates that they should repay and that should not incur harm on the benefactor (Gouldner, 1960). Indebtedness is thus said to arise from this acknowledgment of obligation and duty to one’s benefactors. Lay interpretations of what indebtedness is even suggest that people remain in a state of indebtedness if it appears that the benefactor does not feel fully repaid.
(Greenberg, Bar-Tal, Mowrey, & Steinberg, 1982). Developmentally, an understanding of the norm of reciprocity occurs around the time children enter elementary school, although at this point they do not comprehend benefactor cost as a function of their indebtedness (de Cooke, 1992). Indebtedness is related to our reasoning about our obligations to those who provide us with help.

Three antecedents that may cause gratitude (value, cost, and benevolent intentions) may also affect indebtedness, albeit in different ways or in different directions. For example, the magnitude of help is often met with an equal felt obligation to reciprocate, and this effect has been illustrated in earlier work on indebtedness (Greenberg, 1980; Greenberg & Shapiro, 1971). Greenberg & Shapiro (1971) showed how indebtedness prompts reciprocity. Some participants were assigned to construct boxes while having their motor abilities limited by an arm sling; others were not imposed by this limitation. Participants in the arm slings that asked for help from another person (i.e., confederate) expressed more indebtedness to their helper and also shared more of the incurred earnings from constructing the boxes with the person who helped them than those who did not ask for help. Asking for help, it seems, adds value or cost to the related exchange of help or goods.

Relatedly, experimental research has shown how intrapersonal processes can affect one's indebtedness. In one study, participants who were more self-aware and had been given more reward than expected worked harder and applied more effort to subsequent tasks (Reis & Burns, 1982). The more costly the gift or the more that one feels that the benefactor gave up in order to give the benefit, the more indebtedness the recipient incurs.
Objective self-awareness has been associated with indebtedness: in one study, participants reported more indebtedness when recalling a recent benefit when self-aware versus a low self-awareness group (Mathews & Green, in press). Thus our own personal and public expectations and intentions can alter our perceptions of indebtedness.

Additionally, Greenberg (1980) has suggested that asking for help also increases indebtedness toward the benefactor as the cause of the help is not internally generated by the benefactor’s beneficence. Recall that beneficence of the benefactor increases gratitude (Watkins et al., 2006), and this illustrates that the presence or lack of internal motivation of the benefactor can dictate the subjective experience of both gratitude and indebtedness. Using the moral barometer (McCullough et al., 2001) and sociometer theory (Baumeister & Leary, 1995), lack of benevolent intentions may activate a different barometer related to morality – one oriented toward what is just. If a person isn't necessarily acting strictly out of kindness, there might be other motives or future needs that this person is seeking to fulfill through helping. Therefore, indebtedness may function as barometer of social inclusiveness and exchange, but for a different reason – a desire to be fair in social exchanges. Being fair in social exchanges also bears on one's inclusion into a group – if one defaults in an exchange, one's social status is in jeopardy.

Because some of these findings lead to differentiating gratitude, indebtedness may occur under different circumstances not only because the circumstances are different, but because the psychological mechanisms that lead to indebtedness are different from those that lead to gratitude. I posit that one of the core distinctions between gratitude and indebtedness is that indebtedness is rooted in our ability to reason about social situations.
First, is indebtedness involved in reasoning and thinking about an exchange – that is, is there a innate architecture in the human mind that is able to process information about fairness? More broadly speaking, does social cognition in general follow logically consistent rules and conclusions? Is there evidence to suggest that there is such a thing as a “social calculus”, and if so is this type of reasoning different from how people think about other social interactions and objects? I propose that indebtedness arises from our ability to perform “social calculus”, to understand the nature of “tit for tat” giving and receiving of benefits, and is associated to the specialized features of solving social exchange problems.

*The Error or Intelligence of Social Cognition?*

Social psychological research has used propositional logic for determining human error in judgment (Kahneman & Tversky, 1983; Tversky & Kahneman, 1974). That is, people use heuristics and biases (“cognitive shortcuts”) to solve problems, and using such biases leads to logically incorrect conclusions. These logically incorrect judgments are termed “errors” in cognition. However, these “errors” are not necessarily errors at all, but involve the use of contextual information in making judgments; using “content-blind” norms of logic as a benchmark for human intelligence and cognition is precarious (Gigerenzer, 1995; 1996). As Gigerenzer states:

“We need to work out how the mind infers the meaning of a conditional statement from the content of the Ps and Qs and the social context in which the statement is uttered, rather than exclaiming “Cognitive illusion! Hurrah! Error!” whenever human reasoning cannot be reduced to propositional logic” (p. 324, 1995).

From this argument, some research has shown, that in fact, when the context of a problem is made salient and problems are framed in tandem with this context, people are much
better at using propositional logic (Cosmides, 1985, 1989; Hertwig & Gigerenzer, 1999; Tversky & Kahneman, 1983). The example and instructional variations are such (taken from Tversky & Kahneman, 1983):

Linda is a 31 year old, single, outspoken, and very bright. She majored in philosophy. As a student she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations.

Which of two alternatives is more probable:

Linda is a bank teller.

Linda is a bank teller and a feminist activist.

Invariably, most participants choose the second option. However, the second option is logically incorrect: It is much more probable for one event to be true than for two events to be true. Why do people use such fallacious logic? Because based on the contextual cues in the description and people's real world experience, that the second option is probably true. In short, the description of Linda is deemed relevant to solving the problem (Gigerenzer, 2005). When slight modifications are made to the framing of the instructions, however, performance changes. In another variant of this same description of Linda, the following instructions and options are given:

There are 100 persons who fit the description above (Linda's). How many of them are:

Bank tellers?

Bank tellers and active in the feminist movement?

All participants gave the logically correct answer (Hertwig & Gigerenzer, 1999). This implies that the framing of a question as probable versus how many cues people to what
information is relevant or irrelevant to solving the problem. People will use contextual information depending on how the contextual information is given and framed. Rather than simply making the fewest errors, the adaptive bias of human cognition is to make the least costly error (Haselton & Buss, 2000). Using the “Linda the bank teller” example, the cognitive bias for people is to assume that the information about being a feminist is evidential when what is likely – it seems less costly to assume a false positive. In contrast, it is less costly to assume a false negative when the objective is to determine how many people fit a description – here a false negative is less costly and it is best to assume that more people fit “bank teller” as a descriptor than “bank teller and active in the feminist movement.”

This general principle that “context matters” links to interesting, analogous findings in social exchange problems. Specifically, the way that people reason about giving and taking benefits from one another also does not follow logically consistent deductions. Rather, there are domain-specific, cognitive mechanisms that “kick in” when a situation is framed as a social exchange problem. I propose that this mechanism is related to indebtedness and how people think about benefactors and benefits.

*Deontic Reasoning*

*Deontic* (from the Greek word meaning “duty”) reasoning is a type of modal logic concerned with concepts of permission and obligation. That is, deontic reasoning is about what you can do and what you are required to do (Fiddick, 2006). This type of reasoning does not following the more generic rules of formal propositional logic. Rather, these deontic concepts arise from using ordinary life experiences, come from adaptive features
of cognitive architecture, and are forms of *pragmatic reasoning schemas*. Pragmatic reasoning schemas are “...context-sensitive rules which, unlike purely syntactic rules, are defined in terms of classes of goals and relationships to these goals” (Cheng & Holyoak, 1985, p. 395). There are more specialized schemas within the pragmatic class such as the permission schema. The permission schema describes a type of regulation in which acting requires meeting a certain precondition (e.g., If you want to borrow the car, you must clean your room). In other words, this specialized cognitive module is designed to solve domain-specific problems involving permission and requirement. If you fail to fulfill the obligation set forth, you violate this type of reasoning. Humans are especially sensitive to logical violations in this context, and evidence suggests that this is an evolutionary adaptation called the *cheater detection algorithm* (Cosmides, 1985; 1989; Gigerenzer & Hug, 1992).

People who pay costs but never incur benefits are plausibly rare: our need to detect and avoid such people is not necessary. Social exchange simply could not happen if altruistic people were consistently and constantly exploited – developing a capacity to detect cheaters was necessary in human evolutionary history (Cosmides & Tooby, 1992). A group of cooperators, therefore, would not survive if they were introduced to and exploited by a group of cheaters. However, the other side of the coin is that a group of cheaters would not survive if a group of cooperators who could detect cheating were competing for resources: cooperators could distinguish those who would not reciprocate resources and thus would not engage in exchanges with these cheaters. Emotions (as commitment devices), facial expressions, body language, etc. worked as indicators of
whether one was cheating or not. Of course, a cheater could learn and utilize some of these
devices – but at an eventual expense of revealing the cheating and failing to feel and
express remorse and guilt (Frank, 1988). To boost the chances of not being cheated, then,
requires additional abilities; an integral part of social exchange involves detecting cheating
successfully and this arises from the adaptive computational abilities of human reasoning.

In particular, and at the core of indebtedness, is this ability to reason about the
consequences of cheating – indebtedness encompasses what one must do to fulfill
requirement and avoid violating a social exchange. It is not only advantageous to detect
cheaters but to not be a cheater. I propose that indebtedness is associated or arises from this
context-sensitive reasoning mechanism about cheating. In social exchanges, we expect to
pay and be paid. Social contract theory and its subsumed mechanism, cheater detection,
provide a theoretical link to how indebtedness comes into play as cognitive information
used in the evaluation of social exchange situations.

*Social Contract Theory*

Social contract theory postulates that domain-specific mechanisms operate to solve
social exchange problems and delineates situations in which one should engage in social
exchange. Of importance to this dissertation is the social cognitive ability to reason about
social exchange – it follows adaptive conditional rules of social contract algorithms
(Cosmides, 1985, 1989; Cosmides & Tooby, 2005). A social contract algorithm is one that
senses the preconditions for an action to follow, similar to the permission schema: If you
accept \( X \), then you must be \( Y \). The human mind has the capacity to distinguish situations
that involve exchange and those that do not (Cosmides, 1989; Cosmides & Tooby, 2005).
As with other logic problems, people are not very good at identifying violations of the logic in conditional statements (Cosmides, 1989; Gigerenzer & Hug, 1992). Utilizing the Wason (1966; 1968) selection task, people are able to identify logical violations correctly when the problem involves a social exchange scenario – they are interested in violations of the conditional because such violations are indicative of cheaters (Cosmides, 1989; Gigerenzer & Hug, 1992). In contrast, people are not successful at the task when the problem is framed with a more generic scenario. To be logically correct, people should pick cards that correspond with P & ~Q. To illustrate, I present examples from aforementioned experiments.

The first rule is referred to as the “transportation rule.” Participants reading this rule were told they were studying the demographics of transportation. They were instructed to read the rule and then were given four cards that had information about four people who are residents of the area. Each side of the card has a piece of information about the person: one side states where the person traveled, the other side states how the person got there. The four cards, on the visible side, say: “Boston” (P), “Arlington” (~P), “subway” (Q), and “cab” (~Q). The participant is then asked to choose those card(s), and only those cards, that one has to turn over in order to see if any of these individuals violate the rule. Here is the rule:

If a person goes into Boston, then he takes the subway.

The logically correct answer is to choose the cards that say “Boston” (P) and “cab” (~Q). However, only 30% to 40% of participants answered this correctly in Cosmides' original test of her theory (1985; 1989).
In contrast, consider the following rule, accompanied by an explanation of cassava root and tattoos. Cosmides frames the problem as such: Cassava root is a highly-prized aphrodisiac. Men of the Kaluame tribe receive a tattoo once they are married. The elders of the tribe have established the following rule because they disapprove of people having sex before marriage. Participants are then asked to take the perspective of a guard in charge of catching people who are trying to break the law. As with the transportation rule, participants are told to indicate those cards, and only those cards, that are necessary to turn over to detect a violation. The cards are “eats cassava root” (P), “no tattoo” (~Q), “eats molo nuts” (~P), and “tattoo” (Q). Here is the rule:

*If a man eats cassava root, then he must have a tattoo on his face.*

The correct cards to choose in this case are the “P” card (“eats cassava root”) and ~Q (“eats molo nuts”). Over 70% of participants are able to correctly identify the P and ~Q cards when the problem is framed as a violation of a social contract (Cosmides, 1989). This finding illustrates that human cognition is sensitive to situations that violate social agreements made between people. In the case of the previous example (“If a person goes to Boston, then he takes the subway”) there is no social expectation contained within the phrase. Both instances are subject to logical violation, but the human mind is especially good at detecting violations or cheating in social contracts.

It could be that social contract violations have steeper consequences than non-social violations. Some researchers argue that social contracts and cheater detection are simply functions of maximizing favorable outcomes and/or avoiding losses (Kirby, 1994; Manktelow & Over, 1991; Oaksford & Chater, 1994), and only when there is an
impending loss does the cheater detection algorithm work. If this were the case, cheater
detection would only be important to situations in which one could incur a cost with no
return. Recent research has illustrated, however, that cheater detection can not necessarily
be deduced to a simple loss aversion: people will look for cheaters even when they will
benefit from being cheated (Fiddick & Rutherford, 2006). For example in one experiment
(Experiment 1, Fiddick & Rutherford, 2006) participants were presented with the
following problem describing a social contract with a gang member, Rocky:

“If you touch my motorcycle, I’ll break your legs.”

In this case, participants still select cards that are consistent with seeking violations of a
social contract: participants choose “P” (“touched motorcycle”) and ~Q (“didn't break
legs”). Clearly, this is the best possible scenario and certainly is not a choice oriented
around loss aversion. Therefore, this lends further evidence that cheater detection is
domain-specific and is different from other basic psychological mechanisms (e.g.,
approach – avoidance motivation).

Other Explanation?: Communal and Exchange Relationships

In a sense, and despite the theoretical foundation being set forth in this
dissertation, there is seeming similarity between gratitude and indebtedness, and to a
greater extent, our day to day language uses the term “gratitude” and “indebted” to
communicate similar evaluations. However, a newly emerging body of evidence suggests
that gratitude and indebtedness are different ways to respond to a benefit received
(Mathews & Green, in press; Tsang, 2006; Watkins, Scheer, Ovnicek, & Kolts, 2006). The
crux of this dissertation is that gratitude and indebtedness are different aspects of an overall
evaluation. It is also likely, however, that these are not distinct aspects of a response, but are entirely unique responses altogether. In other words, each response could be exclusive to an attribute or factor relevant to the exchange itself. One factor that could affect this and could also be a theoretical explanation for such differences is the type of relationship that the beneficiary and benefactor have. Therefore, it could be argued that these distinctions I am presenting are just reflections of different types of relationships, namely the distinction between communal and exchange relationships.

Clark and Mills (1979) offer theoretical suggestions about how these two types of relationships and social exchange may function. Communal relationships, such as marriages and close friendships, focus on long-term commitments and involve attending to each other’s needs. That is, communal relationships are less focused on equity in exchanges and are more focused on providing help and care to close others with no “strings attached”. In contrast, exchange relationships focus on the incurring of debt and the repayment of that debt in a timely manner. This type of relationship does focus on equity in an exchange and is similar to keeping a balance sheet of what is given and taken by each member of the relationship – in the end, the balance should be zero. One would expect that gratitude would be commonly expressed in communal relationships – benefits are given out of the desire to help provide for the needs of the beneficiary, and thus the response should be directed toward the goodness of the gift. Indebtedness, on the other hand, should be the response that accompanies benefits received in an exchange relationship, one that follows the contours of the norm of reciprocity.
Despite these intuitive connections, it is plausible that these responses simply arise out of different relationship contexts. Some research suggests, however, that this may not necessarily be the case. In one study, it was shown that participants were much more appreciative and positive toward strangers who had helped them than receiving help from family members (Bar-Tal, 1977). For example, if a family member (i.e., communal relationship) takes you to the airport, your response to them might be thankful but not necessarily overwhelmingly so. If a stranger gave you a ride to an airport, this unexpected help would probably elicit stronger positive response. In one respect, the element of unexpectedness of receiving from a stranger probably prompted positive feelings. In another respect, there are clear roles about helping family members (i.e., communal relationships) and thus help is expected. Finally, the type of relationship may make different cognitions and emotions more salient, thus highlighting different aspects of the overall evaluation of the benefactor. More importantly, and the bottom line is that while closer relationships may foster and promote positive feelings, positive feelings such as gratitude are not exclusive to only close relationships. In a previous section it was suggested that gratitude may function as a signal to non-kin benefactors that we acknowledge their goodness and treat it in kind (McCullough et al., 2008) – a way to broaden and build our social networks and illustrate our own goodness.

The thesis that gratitude is related to emotions and that indebtedness is related to cognition, then, presents an extension on previous work about communal versus exchange relationships. While at first glance it seems that a positive emotion such as gratitude would be important and part of communal relationships and indebtedness, the calculus of social
exchange, would be an integral part of exchange relationships, the current thesis points to instances in which these basic assumptions are not necessarily the case. Both gratitude and indebtedness can be relevant to different types of relationships. If it is not strictly relationship type that creates gratitude and indebtedness as distinct aspects of a benefactor or benefit evaluation, then what is? Are there factors that seem to drive our emotions and cognitions related to social exchange?

Evidence for Differences Between Gratitude and Indebtedness

The majority of the research comparing and contrasting gratitude and indebtedness follows: either an increase or decrease in either gratitude or indebtedness is attributed to an independent variable, rarely are both affected by experiments. A notable exception is a vignette study conducted by Watkins and colleagues (2006). In this study, researchers manipulated benefactor expectations, and it was found that when a benefactor was perceived to have no expectation of repayment, gratitude increased; when there was a benefactor expectation, gratitude decreased and indebtedness increased. Other studies have failed to find inverse movement between gratitude and indebtedness when they are used as dependent variables (Mathews, 2008; Mathews & Green, in press; Tsang, 2006): either gratitude or indebtedness is affected, but not both.

I posit there are at least two specific reasons why this interesting pattern emerges in the research on gratitude and indebtedness. First, there are noted ceiling effects with measures used to assess gratitude. In two recent samples of data that I have collected, means from the Gratitude Questionnaire (GQ-6), one of the most commonly used gratitude measures, were approximately 6, on a scale of 1 to 7, with 7 representing the highest
endorsement of gratitude. Second, and to reiterate the inherent nature of gratitude and indebtedness, these responses are not opposite ends of a continuum. I argue the opposite of gratitude is ingratitude, a sense of entitlement; the opposite of indebtedness is to a lack obligation. Therefore, it is psychologically possible to hold both of these responses toward a benefactor (or in part, toward the benefit itself).

I want to understand why some studies result in changes in gratitude and why some studies result in changes in indebtedness, and whether the previous empirical findings are tapping into separate aspects of evaluating benefits and benefactors. I posit that gratitude is an emotional response in social exchange whereas indebtedness is a cognitive response of social exchange. Both gratitude and indebtedness fall under the larger umbrella of how people respond to benefactors – gratitude is the felt emotion and indebtedness is the thought process that accompanies the general evaluation of the benefactor and benefit. As such, different situations, benefactors, and benefits may make either affective, cognitive, or behavioral components salient to an individual. In part, I suggest that these various factors interact with each other to sometimes create consistency, and at other times inconsistency, amongst affective, cognitive, and/or behavioral responses. The most interesting aspect of this model's utility, however, may lie in its predictive value. Rather than relying simply on external factors or context to determine reciprocity behavior, the proposed model is based on one's overall evaluation of a benefit or benefactor, and thus is dependent on a person's internal world as well as the outer world.
Tripartite Theory of Attitudes

Important to this conceptualization is attitude theory and research. Attitude theory and research has addressed how different components or aspects of an evaluation can be coherently conceptualized to predict attitudes and consistency between the distinct components. Specifically, attitude theory and research offers a natural language and theory for exploring the affective, cognitive, and behavioral components of how we evaluate benefits and benefactors. Particularly, models of attitudes that address the multiple components of attitudes – for example, the tripartite model of attitudes – may be useful in explaining how a person can evaluate a target with both feelings of gratitude and beliefs of indebtedness. I present the tripartite theory of attitudes as a new way to view gratitude and indebtedness. I am suggesting that benefactors and benefits are specific attitude object, and that evaluations of benefits and benefactors are comprised of three separate components: affect (gratitude), cognition (indebtedness), and behavior (reciprocity).

First, what is an attitude? An attitude is defined as a summary evaluation of an attitude object (Fazio, 2007). That is, an attitude is a person's overall evaluation of whether one feels, thinks, or behaves positively or negatively toward a target or object. It is an enduring representation of a person's experience with a given target (Fazio, 2007). Simply stated, attitudes are guides or opinions that each individual possesses about both social and nonsocial objects, and these opinions vary across people. For example, my attitude about heavy metal music is different from my girlfriend's attitude about heavy metal music: I love it and she doesn't care much for it. In this respect, evaluations of an object typically
vary across a continuum of general liking to general disliking – there are shades of gray for most attitude objects.

Tripartite theories of attitudes posit that there are three measurable components in the structure of the overall attitude: affect, cognition, and behavior (Breckler, 1984; Ostrom, 1969; Katz & Stotland, 1959; Rosenberg & Hovland, 1960; Thurstone, 1928; Zanna & Rempel, 1988). In particular, it has been suggested that all three components should manifest in any given attitude; that is, the three components should be identifiable in the overall evaluation via appropriate measures and that each component should be relatively consistent with the other components (Rosenberg & Hovland, 1960). There is a problem with this assumption (see Olson & Fazio, 2001 & Zanna & Rempel, 1988 for reviews), namely that all attitudes are not manifestations of all of these three components. Take the topic of abortion, for example: A person may believe that granting women reproductive rights is positive, but that when confronted with actually having an abortion, the feelings about having an abortion are negative. In this case there is inconsistency in valence between one's thoughts and feelings about an attitude object, therefore one's attitude about abortion may be predominated by either affective, cognitive, and/or behavioral components. Attitudes can be formed through any of these three aspects, and thus lends specific credence to my proposed theory of gratitude and indebtedness as different aspects of an overall evaluation of a benefit or benefactor.

*Attitude Formation & Evaluating Benefactors and Benefits*

Attitude formation addresses how people learn and create overall evaluations of attitude objects. Some attitudes are learned through direct experience (e.g., actually
encountering that attitude object) while others are formed indirectly (e.g., through cultural transmission). For example, as a child, I had a relatively negative attitude about sushi based on indirect experience – I had never had sushi but my mother said it was gross. However, my attitude has changed about sushi as an adult through direct experience (i.e., actually trying and eating sushi), and I find it most enjoyable. Important to this dissertation is the formation of attitudes about people who provide us benefits (and those benefits provided) through our direct experience. In addition, different ways or routes in which these attitudes are formed may alter our overall evaluation of the benefactor and benefit.

Broadly speaking, attitudes about benefactors and benefits are learned, stored in memory, and used to navigate social exchanges. The first step of developing attitudes about social exchange partners and their corresponding benefits may come from basic learning principles of approach and avoidance. Research suggests that people have a negativity bias toward novel objects – on average, human social cognition is oriented toward learning negative information about novel objects rather than positive information (Fazio, Eiser, & Shook, 2004). People may learn to associate positive emotions and thoughtswith benefactors and the benefits they provide, regardless or in addition to other associations that we may have previously attached to the benefactor or benefit. Conversely, benefactors and benefits that possess negative emotional valence to us may not be appreciated in the same manner as a more neutral or positive benefactor or benefit. The way that we learn and form attitudes has an interesting impact on how we evaluate people and things involved in our social exchanges.
Affect & Gratitude

The affective component of the tripartite model is associated with a person's emotional reaction or “gut feelings” toward an attitude object. Often times our first reaction to an attitude object is affectively based (Zajonc, 1980). Attitudes are affectively based when either positive or negative feelings arise when presented with the attitude object and can be learned through a variety of basic learning processes, including operant conditioning (response – outcome), classical conditioning (covariation of attitude objects/stimuli), and mere exposure (making attitude object accessible or exposed) (Fazio & Olson, 2001). To illustrate how affectively based attitudes develop, take the following examples. Insko (1965) found that by verbally reinforcing participant responses with a positive reinforcer (e.g., “good!”), these reinforced responses were prevailed even after a week of the initial response – outcome pairing. Olson & Fazio (2001) used classical conditioning to create positive feelings toward Pokeman characters. Participants were exposed to characters that either co-occurred with positive or negative words: Pokeman characters paired with positive words were evaluated as more pleasant and positive than the characters paired with negative words (Olson & Fazio, 2001). Finally, research has also suggested that by merely being presented with an object (i.e., mere exposure effect) that liking for that object increases. Zajonc (1968) exposed participants to Chinese ideographs, yearbook photos, and nonsense words. The general finding was that the more that participants were exposed to these attitude objects, the more that they liked them. In each of these cases, the association of positive feelings to attitude objects is not occurring consciously, but rather unconsciously and without cognitive elaboration of the attitude
object and the corresponding evaluation. Thus, each of these instances presents the possibility that attitudes can be learned non-cognitively and that the likely mechanism of this learning is through basic affect. While it is beyond the scope of this work, I suggest that gratitude is learned through these different learning mechanisms, and that different ways of learning might enhance or hinder one's capacity for gratitude. For example, expressing gratitude may be reinforced. When I thank someone, simply by receiving a response, such as “You are welcome!” affirms my expression of gratitude.

Returning to the concept of a commitment device, our emotional responses toward social exchanges – particularly the benefactor of the exchange – is typically positive. As Boyer (2001) points out, gratefulness may come from the association of the feeling that the benefactor may have done something for us that was not necessary and also did not cheat us when he could have. I posit that gratitude is learned through this association of positive feelings with the benefactor who bestowed something of value that they didn’t have to necessarily provide. In other words, gratitude is not elicited by normative rules and/or involves emotional associations to those who do not seek to cheat us.

*Cognition & Indebtedness*

The cognitive component of the tripartite model is associated with the person's thoughts and beliefs about the attitude object. In particular, cognitively based attitudes arise from the belief that an attitude object has good or bad qualities and will bring about either good or bad outcomes. The expectancy-value model (Fishbein & Ajzen, 1975) posits that all attitudes are derived from the overall summary evaluation of expected probabilities or values. Expectancy is one's estimate of whether or not a certain attitude object has a
particular quality, and the value of the attitude object is subjectively assigned (i.e., personal evaluation of that quality). While tripartite theories of attitudes depart from Fishbein & Ajzen's conceptualization of attitudes as one component (cognitive), there general theory fits nicely with social contract theory in regards to indebtedness: it is the component of the evaluation that is relevant to adaptive biases regarding social exchange.

Previously I had suggested that indebtedness is rooted in people's innate reasoning about social exchange, and in particular, is associated with deontic reasoning and cheater detection. I propose that indebtedness is intertwined with our reasoning about expectancy in social exchanges; human social cognition is attuned to violations in social exchange. Our sense of what is owed and what is fair directly follows from this reasoning, and I posit that this sensitivity to cheating in social exchanges is what drives thoughts of indebtedness.

Behavior & Reciprocity

The behavioral component of the tripartite model is associated with direct and indirect experience with the attitude object. People do learn attitudes from their current or past behavior, as proposed in self-perception theory (Bem, 1972). If I take note that I am currently drinking a glass of tawny port that I just poured for myself, I can infer that I have a positive attitude toward tawny port. When translating this inference to a specific social exchange – and in particular the benefactor and the benefit itself – we can recall our previous experiences with the benefactor and the benefit. It is important to consider that our behavior in social exchanges may contribute to our overall evaluation of the benefactor and benefit if we have previous experience with each. Thus, a person’s previous
interactions and behaviors with and toward the benefactor and benefit can factor into one’s attitude toward a benefactor and benefit.

These three aspects can interact to form, create and sustain attitudes toward benefactors and benefits. Importantly, each of these may vary in strength; affect, cognition, and behavior may be more salient and thus may predominate one’s overall attitude toward the attitude object (i.e., benefactor or benefit). The strength of one’s attitude is largely determined by the accessibility of our feelings, thoughts, and behaviors about benefactors and benefits.

*Strength & Accessibility of Attitude*

An important quality of an attitude is the strength of the association between the attitude object and the evaluation of that object (Fazio, 1995; Fazio & Olson, 2001). Attitude accessibility is the ease of activation of the attitude from memory when encountering the relevant attitude object (Fazio, 1989; Fazio & Williams, 1986; Fazio, Powell, & Herr, 1983; Fazio, Sanbonmatsu, Powell, & Kardes, 1986) The more that a person encounters an attitude object, the more accessible that attitude becomes (Fazio, 2007; Fazio, Blascovich, & Driscoll, 1992), particularly when we have direct experience with the attitude object (Fazio, 1989). For example, the more that I listen to heavy metal music, the more salient my opinion of heavy metal music becomes. Thus, having an attitude, specifically having attitudes that are accessible, provides a functional advantage for navigating social life; an attitude frees up psychological resources and allows for quick and relatively accurate judgments of objects (Fazio, 2007; Fazio, Blascovich, & Driscoll, 1992).
The importance of accessibility in social cognition and attitude formation implies that if a person has an accessible attitude about a particular object, then that attitude should be a significant determinant of behavior. This intuitive assumption is not entirely accurate and requires qualification: early social psychological experiments illustrated that a person's opinion about a target does not necessarily match one's behavior toward the target – the classical example being the LaPiere's 1934 study investigating hoteliers' attitudes and behaviors toward Chinese travelers. In this study, hoteliers who provided service to Chinese travelers later claimed that they would not. Of course, there were several limitations to the methodology used in this particular study, but the point is well taken: there can be inconsistency between what a person's attitude is and what a person does.

One factor that can improve consistency amongst the aspects of an attitude is direct experience; actually having interactions with the attitude object increases the correspondence between the attitude and behavior (Breckler & Wiggins, 1993; Fazio, 1986; Fazio, 1989). This correspondence between direct experience, strength, and formation of an attitude has a direct impact on how we evaluate benefactors and benefits. What drives these correlations might be, in part, determined by the affective, cognitive, and behavioral components contributing to this experience. In order to investigate this, encountering a benefactor and benefit that is novel is crucial to determining how attitudes about benefactors and benefits are formed. The purpose of this dissertation, then, is to investigate the formation of an attitude toward a novel benefactor and benefit directly. Only then can we see if emotion, cognition, or behavior plays a pivotal role in developing attitudes in social exchange situations.
Summary

To review, I posit that people form and maintain unique evaluations of benefactors and the benefits they provide. Both gratitude and indebtedness possess adaptive bases that help form and maintain these evaluations, as well as provide people with information for successful social exchanges and interpersonal relationships. Specifically, I posit that gratitude is associated with a person's feelings about the benefactor and/or benefit. Indebtedness is directly related to cognitive aspect of the evaluation; it requires linking adaptive cognitive biases to the benefactor and the interaction between self, the benefactor, and the benefit. Simply stated, gratitude is associated with how we feel about the factor and qualities involved in social exchange, whereas indebtedness is what we think about these factors and qualities of social exchange. These two components of appreciation can be consistent or inconsistent with each other depending on situational factors, and thus may independently predict behavior (i.e., the ability, desire, or need to reciprocate benefits).

The specific aims of this thesis are threefold: 1) to show that measures of emotion and cognition will load onto separate factors in a confirmatory factor analysis, 2) a composite score of the emotion measures will predict grateful emotion, whereas a composite of the cognitive measures will significantly predict an indebtedness measure, 3) to show that focusing on feelings toward a benefit increases gratitude whereas focusing on beliefs about a benefit increases indebtedness.
Hypotheses – Study 1

1. I posit that gratitude is an emotional component of an overall evaluation of a benefactor and benefit.

2. I also posit that indebtedness is a cognitive component of an overall evaluation of a benefactor and benefit.

3. Finally, I also predict that reciprocity is the behavioral component related to one’s overall evaluation of the benefactor and benefit. Gratitude and indebtedness may uniquely interact with reciprocity behavior to predict overall attitudes toward benefactors and benefits.

Hypotheses – Study 2

1. I predicted a main effect for the pre and post-game gratitude and indebtedness: after the distribution game (post test), participants would report greater levels of gratitude and indebtedness compared to the pre-game conditions.

2. I also predicted a main effect for the game condition: participants would report more gratitude in the gratitude condition compared to the indebtedness and chance condition, and participants would report more indebtedness in the indebtedness condition compared to the gratitude and chance conditions.

3. Additionally, I predicted significant interactions. Participants’ post-game gratitude scores would be significantly higher than the pre-game gratitude scores. Also, participants would report more indebtedness in their post-game scores in the indebtedness condition than the pre-game indebtedness scores.
4. I predicted that separate factors would emerge from the analysis: positive affect, negative affect, normative cognition, and prosocial thought.

5. I predicted that positive affect would be directly associated with gratitude across all conditions and that indebtedness would be directly associated with normative cognition across all conditions.

6. Analyses were conducted to examine mean differences between positive affect and gratitude and indebtedness and normative cognition.
Chapter 2

Study 1

Data Collection Issue

Due to several factors beyond my control, the following studies’ results provide an exploratory basis for the general hypotheses proposed. The data collection process involved a within-subject variable (i.e., pre-post test). The Institutional Review Board at Virginia Commonwealth University had granted permission for me to collect data from three hundred (300) participants which met the specifications of the power analysis. Participants were instructed that there were two parts to the study. The first phase (pre-test) of data collection took place via SONA, a data management system that is used by the Psychology Department at VCU. This was the advertisement and language used on SONA to recruit participants for Part I, the online pre-test:

“This IS PART 1 OF A TWO PART STUDY. After you complete this part online (Part 1), you will sign up for Part 2 on SONA during a scheduled time. You will receive .25 credit after completing Part 1, and another .75 credit after you complete Part 2. For Part 1 (online portion), you will complete a series of questionnaires that assess your personality and your beliefs and feelings about social interactions.”

Once participants completed Part I on SONA, the system automatically recognized the participants as eligible for Part II of the study. That is, this was a systematic way to prevent people for signing up for Part II without completing Part I. As such, a separate
advertisement was viewed for Part II. Here is the advertisement posted on SONA that participants viewed for Study 2:

“THIS IS PART II OF A TWO PART STUDY. You must complete Part I online before you can sign up for this study. This study investigates how people play games with partners. You will take part in a short game and complete questionnaires and surveys about your interaction with your partner.”

In addition to the notice on SONA, participants were sent personal and confidential reminders to sign-up for Part II after completing Part I of the study. Despite the clear instructions and reminders, 66% of the participants (over 180 participants) that completed Part I did not complete Part II. This affected the ability collect a sufficient sample size given an additional constraint that necessitated completing this dissertation without time for additional data collection in another semester. The implication is that this technique for collecting pre and post-test data from the Psychology 101 participant pool at Virginia Commonwealth University may not be a good method. Instead, researchers may gather appropriate sample size by requesting participants to report to the lab for both Part I and Part II.

Method

Study 1 was a within subjects design to test the basic model. The first purpose of this study was to see if people’s responses to benefits are associated with two separate factors: emotions and cognitions. That is, the goal of this first study was to create measures that can assess a person emotional response to benefit as well as beliefs about the benefit. The second purpose was to see if emotions and cognitions are associated with gratitude and indebtedness respectively. Participants played a game that involves distributing
resources. They were told that there are four rounds to the game, and that during each round, raffle tickets for prizes will be distributed. They worked with a partner (confederate) in each round, and distributed tickets back and forth for two separate raffles. Thus, the third purpose of this study was investigated by using the number of raffle tickets distributed as a behavioral dependent measure.

A power analysis conducted for a directional $t$ test, $\alpha = .05$, $\eta^2 = .10$, and $1 - \beta = .80$ suggests that a sample of approximately 30 people was sufficient. However, for an exploratory factor analysis, this sample size is not sufficient, so caution should be taken in interpreting the factor loadings.

Participants

There were thirty six Virginia Commonwealth University undergraduates (47% female) who completed both pre and post-game measures for partial course credit. The sample was reasonably diverse (16 Caucasian, 8 Asians, 7 African Americans, 2 Latina/o, & 3 that identified as mixed race); mean age was 19.86 ($SD = 2.57$).

Materials

Gratitude Questionnaire. ($GQ-6$). The Gratitude Questionnaire ($GQ-6$) is a questionnaire developed by McCullough and colleagues (2001). The $GQ-6$ is a 6 item scale that assesses dispositional gratitude. Participants rated these items using a scale that ranges from 1 (“strongly disagree”) to 7 (“strongly agree”). An example of one of the $GQ-6$ items is “I have so much in my life to be thankful for.” Two items are reversed scored to account for response bias. The internal reliability of the $GQ-6$ ranges from .82 to .87. This measure was administered during both the pre and post-test.
Short Gratitude, Resentment, and Appreciation Test. (GRAT). The short version of Gratitude, Resentment, and Appreciation Test (short GRAT) is a 16 item measure of trait gratitude. The short GRAT contains three subscales: Sense of Abundance, Simple Appreciation, and Appreciation for Others. The Sense of Abundance items are statements such as “I think it is important to appreciate every day that you are alive.” This scale taps into feelings that one has enough benefits in life and doesn’t feel entitled to benefits. Simple Appreciation items, such as “Every spring, I really enjoy seeing the flowers bloom,” tap into awareness of benefits in mundane, every-day living. Statements assessing Appreciation of Others, “I couldn’t have gotten where I am today without the help of many people”, assesses the appreciation of social bonds and the respect for interdependence. Participants rated these items on a scale of 1 (“I strongly disagree”) to 9 (“I strongly agree”). This scale contains adequate validity and internal consistency (Thomas & Watkins, 2003). This measure was administered during both the pre and post-test.

Indebtedness Scale. The Indebtedness Scale was originally developed by Greenberg (1980). However, this scale did not have good reliability. Thus, the version used in this dissertation is a recently validated version (Watkins, Elster, Maleki, & McLeod, 2005) that shows better psychometric properties. Reliability was high in a recent sample ($\alpha = .89$), Mathews, 2007). Participants rated the items on a scale of -3 (strongly disagree) to +3 (strongly agree). Examples of such statements are “One should return favors from a friend as quickly as possible in order to preserve the friendship” and “Often I have trouble enjoying gifts from others because I’m concerned about what I will give them in return.” This measure was administered during both the pre and post-test.
**Semantic Differential.** A semantic differential scale was used for both the benefit and benefactor on a scale of 1 to 7. This measured the overall evaluation of the benefit and benefactor. The following differentials were used for the benefit: good – bad, helpful – unhelpful, valuable – worthless, useful – useless, pleasant – unpleasant, meaningful – meaningless. The differentials for the benefactor are: good – bad, helpful – unhelpful, nice – mean, fair – unfair, pleasant – unpleasant, kind – unkind, and brave - cowardly. This measure was administered during the post-test only.

**Emotion Measure: Positive and Negative Affect Scale. (PANAS).** The Positive Affect and Negative Affect Scale (PANAS) was used to assess positive and negative affect. It has high validity and reliability over time (Watson, Clark, & Tellegen, 1988). The scale contains two independent factors: positive and negative affect. Positive descriptors are items such as “excitement” and “strong.” Examples of negative descriptors are “guilty” and “anger.” This measure was administered during both the pre and post-test.

**Cognitive Measures: Thought Listing.** Participants were asked to list their thoughts about the benefit and benefactor separately. There was no time limit – participants wrote for as long as they wished. These thoughts were coded as normative (e.g., “I should help my partner”), negative (e.g., “My partner is mean”), prosocial (e.g., “I am helping my partner”), and positive (e.g., “I think my partner is attractive”) cognitions by two independent coders. In addition, a tally of the total thoughts written was calculated. Interrater reliabilities were examined (see Table 1). The reliability for the Normative and Prosocial categories were low. Part of this was due to fewer instances of that thought, so
one discrepancy between coders created a lower correlation coefficient. This measure was administered during the post-test only.

*Reciprocity Behavior.* The number of raffle tickets in Round 3 were counted as reciprocity behavior. Participants were also asked the following questions and rated them on a scale of 1 (“definitely not”) to 7 (“definitely”): Would you help your partner with their homework?, Would you like to meet your partner face-to-face?, Would you help a friend of your partner's? This measure was administered during the post-test only.

*Design and Procedure*

This study was a partial replication of a study designed by Tsang (2007). Participants signed up for the study (“Games with Partners”) and completed pre-test measures of gratitude and indebtedness on SONA, the research management system used by VCU. These pre-test measures were used to examine pre and post test gratitude and indebtedness, as well as potential covariates in the models proposed. Three undergraduate research assistants ran the laboratory sessions. After completing the online measures, participants signed up for Part II, and they were told they would be playing a game that involves distributing resources with a partner. The partner, of course, is a fictitious person, but this cover story was necessary to simulate the experience of giving and receiving benefits to a partner. Participants entered a small lab room located in the middle of hallway that contains three doors, thus it appeared feasible that the partner was in the lab room next door.

The following standardized script was used by the research assistants to instruct participants through the game:
Step 1: Greet participant and introduce yourself.

Step 2: Have participant sit down at table to read and sign consent form. When they are done, sign relevant line where your signature is required.

Step 3: Have participant PRINT their name and email address on the “Sign In” Clipboard. You will assign the participant a Participant #. Be sure to mark this on the sign in sheet, the Log Sheet and the participant’s survey packet.

Step 4: After Steps 1 through 3, read the following script:

“You are taking part in a study that is investigating how people interact with a partner during a game. This game will have four rounds. In each round, you and your partner will distribute 10 raffle tickets for two separate raffles for an amazon.com gift certificate. You and your partner, who is in another room down the hall, are trying to win separate prizes. You will be able to communicate with your partner on slips of paper that I will pass back and forth. In some rounds, either you or your partner will have a chance to decide how many raffle tickets get distributed. You'll complete a series of questionnaires between the 3rd and 4th rounds. The first round is randomly distributed – thus it is due to chance. I will instruct you before the second round about the distribution of the raffle tickets. Are there any questions?”

Step 5: Hand the participant an Envelope labeled “Round 1.”

Step 6: Tell the participant to open the envelope and read the following:

“Inside the envelope should be some raffle tickets. Take the raffle tickets out and I’ll take your empty envelope. On the back of each ticket, there is a space for your name. Please print your name and where it says “Address”, put an email address where you can be contacted.”

(Stick around to make sure they know what to fill out and answer questions.)

Step 7: Read the following script:

“In this second round, your partner is going to distribute the raffle tickets: they will decide how many tickets they’ll keep and how many you will get. In just a moment I will bring you your Round 2 envelope.”

Step 8: Leave the room and go to the common area outside of my office. Let’s try and recycle/re-use the envelopes – so stash this while they wait. Grab an envelope labeled “Round 2”. Work your way back slowly, as we want to simulate the possibility that someone else is on the other end and needs time/instruction as well.
Step 9: Return to the room and hand the participant the Round 2 envelope. Repeat the instructions:

“Inside the envelope should be some raffle tickets. Take the raffle tickets out and I’ll take your empty envelope. On the back of each ticket, there is a space for your name. Please print your name and where it says “Address”, put an email address where you can be contacted.”

Step 10: While the participant is completing Step 9, retrieve an envelope labeled “Round 3”.

Step 11: After participants are done with Step 9 (Round 2 tickets), read the following script and give them the envelope labeled Round 3:

“In this round, you will distribute the raffle tickets: decide how many you want to keep and how many you want to give to your partner. Put the tickets you would like to give your partner in the envelope. Keep the tickets you would like and label them with your name and email address as you did in previous rounds. We’ve also provided a slip of paper if you wish to send a communication to your partner. Please let me know when you are done distributing your tickets and I will bring them to your partner.”

Step 11: If they do not have any questions, let the participant work on the Round 3 tickets. When the participant is done, take their Round 3 envelope from them. Then, read the following script:

“We are going to take a break between Rounds 3 & 4. During this break, we’d like for you to answer a few surveys about your interaction so far. I’ll bring your envelope to your partner while you work on the questionnaires. Do you have any questions?”

Step 12: Leave the room and let the participant complete the survey packet. The end of the packet has instructions for them to alert you when they are done – if they don’t finish in about 15 minutes, swing by the room to make sure they are ok.

Step 13: Count the number of tickets that the participant put in the Round 3 envelope and mark this on the Log Sheet. This is an important dependent variable!

Step 14: When the participant is done, debrief the participant using the debriefing sheet (see Appendices)

Step 15: Be sure to thank the participant for coming in!

Step 16: At the end of all of your sessions, be sure to log into SONA and grant credit to those participants who came in for the day (use Sign-In Sheet). Assign “No Show” to people who did not show up!
In the first round, the participant received three tickets in her envelope, suggesting that the partner has received seven. In each case, the partner distributed the raffle tickets in Round 2. Round 2 was the critical round in that, in the past, it has shown to create a grateful response (Tsang, 2007). In this round, participants received nine raffle tickets and a note from their partner that said “That first round wasn’t good for you. Here are a few extra tickets.”

The Round 3 distribution gave the participant the opportunity to distribute the raffle tickets. Round 3 was critical because it served as a behavioral measure of reciprocity. Participants were instructed to place as many tickets as they’d like to give their partner in the envelope and to keep as many as they wish. There were no time constraints placed on the participants – they had as much time as they liked to decide. After the Round 3 distribution, participants were asked to fill out the battery of measures described.
Chapter 3

Study 1

Results

Sex differences between Gratitude & Indebtedness.

I conducted an independent groups t-test to see if there was an effect of sex on post gratitude and indebtedness. Men \((M = 5.74)\) and women \((M = 5.41)\) reported the same amount of gratitude, \(t(34) = 1.31, p = .21, \eta^2 = .05\), a weak effect. Men \((M = 4.52)\) also reported the same amount of indebtedness as women \((M = 4.57)\), \(t(33) = -.23, p = .82, \eta^2 = .002\), a very weak effect. As there were no sex differences, this factor was not further considered in subsequent analyses.

Gratitude Questionnaire (GQ-6).

I conducted a paired-samples t test to examine differences between pre and post-game gratitude scores. Post-game gratitude \((M=5.88)\) was significantly higher than pre-game gratitude \((M=5.63)\), \(t(35)=2.16, p = .04, \eta^2=.12\), a moderate effect. In this study, twelve percent of the variability in gratitude scores accounted for by the time of measurement after controlling for individual differences.

Gratitude, Resentment, & Appreciation Test (GRAT).

I also conducted a paired-samples t test to examine the other gratitude measurement used in this study. Post-game GRAT scores \((M=6.74)\) were significantly higher than pre-game GRAT scores \((M=6.45)\), \(t(34)=2.12, p = .05, \eta^2=.12\), a moderate effect, with twelve
percent of the variability in GRAT scores accounted for by the time of measurement after controlling for individual differences.

*Indebtedness Scale (IS).*

Finally, I conducted a third paired-samples *t* test to compare pre and post-game indebtedness. As predicted, post-game indebtedness (*M*=4.49) was not significantly different from pre-game indebtedness (*M*=4.56), *t*(33)=−.69, *p* = .50, η²=.01, a weak effect. One percent of the variability in indebtedness scores is due to the time of measurement after controlling for individual differences.

*Exploratory Analysis*

*Positive and Negative Affect (PA & NA).*

I found that post-game PA (*M*=2.90) was significantly lower than pre-game PA (*M*=3.19), *t*(34)=−2.61, *p* = .02, η²=17, a moderate effect, with 17% of the variability in positive affect is due to the time of measurement after controlling for individual differences. In addition, post-game NA (*M*=1.52) was significantly lower than pre-game NA (*M*=1.91), *t*(33)=−4.51, *p* =.001, η²=.38, a strong effect, with 38% of the variability in negative affect is due to the time of measurement after controlling for individual differences.

*Cognitive Measurement Coding.*

In order to compare and contrast affective and cognitive components of responses, the writing tasks in the post-game portion of the study were coded by two independent coders masked to the hypotheses of this study. The written responses for both the benefit (i.e., tickets) and benefactor (i.e., partner) were coded for the following categories: total
number of thoughts, positive thoughts, negative thoughts, prosocial thoughts, normative thoughts, and non-normative thoughts. I removed the non-normative category because it is merely an inverse ratio of the normative category, and for the purposes of analyses, might lead to misinterpretation. Also, after coding, a few discrepancies existed between coders resulting in low rater reliability. After meeting and discussing potential issues (i.e., creating the prosocial category), the coding was re-assessed. Inter-rater reliabilities (i.e., correlation coefficient) are presented here:

Table 1

*Inter-rater Reliabilities for Benefactor Categories*

<table>
<thead>
<tr>
<th>Category</th>
<th>Coder 1</th>
<th>Coder 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td>.84</td>
</tr>
<tr>
<td>Positive</td>
<td></td>
<td>.93</td>
</tr>
<tr>
<td>Negative</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Normative</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Prosocial</td>
<td></td>
<td>.86</td>
</tr>
</tbody>
</table>

Table 2

*Inter-rater Reliabilities for Benefit Categories*

<table>
<thead>
<tr>
<th>Category</th>
<th>Coder 1</th>
<th>Coder 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td>.92</td>
</tr>
<tr>
<td>Positive</td>
<td></td>
<td>.94</td>
</tr>
<tr>
<td>Negative</td>
<td></td>
<td>.81</td>
</tr>
<tr>
<td>Normative</td>
<td></td>
<td>.69</td>
</tr>
<tr>
<td>Prosocial</td>
<td></td>
<td>.66</td>
</tr>
</tbody>
</table>
As illustrated, in general, reliability between the two coders was good. After reliability was established, the coders’ responses were averaged together to create a number for each category. Finally, a ratio of the category to total thoughts was created for both the benefit and benefactor (e.g., positive thoughts of benefactor/total thoughts of benefactor). These ratios were then used in subsequent analyses.

*Exploratory Factor Analysis.*

An exploratory factor analysis was conducted to see if the emotion and cognition measures loaded onto separate factors. I predicted that at least three separate factors should

Table 3

*Factor Analysis of Affect & Cognitive Responses to a Benefactor & Benefit*

<table>
<thead>
<tr>
<th>Factor</th>
<th>+ Thought</th>
<th>Prosocial Thought</th>
<th>- &amp; Norm Benefactor</th>
<th>+ Affect</th>
<th>Norm Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect</td>
<td>.101</td>
<td>.166</td>
<td>-.112</td>
<td>.808</td>
<td>.138</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>-.113</td>
<td>-.173</td>
<td>-.203</td>
<td>-.590</td>
<td>.546</td>
</tr>
<tr>
<td>Positive – Benefit</td>
<td>.816</td>
<td>-.082</td>
<td>.049</td>
<td>.160</td>
<td>-.015</td>
</tr>
<tr>
<td>Negative – Benefit</td>
<td>-.723</td>
<td>-.423</td>
<td>-.155</td>
<td>.202</td>
<td>-.151</td>
</tr>
<tr>
<td>Normative – Benefit</td>
<td>.072</td>
<td>-.057</td>
<td>.122</td>
<td>.094</td>
<td>.876</td>
</tr>
<tr>
<td>Prosocial – Benefit</td>
<td>.146</td>
<td>.833</td>
<td>-.092</td>
<td>.050</td>
<td>-.140</td>
</tr>
<tr>
<td>Positive – Benefactor</td>
<td>.656</td>
<td>-.312</td>
<td>-.214</td>
<td>.446</td>
<td>-.071</td>
</tr>
<tr>
<td>Negative – Benefactor</td>
<td>-.156</td>
<td>-.014</td>
<td>.852</td>
<td>.105</td>
<td>.262</td>
</tr>
<tr>
<td>Normative – Benefactor</td>
<td>.203</td>
<td>-.010</td>
<td>.759</td>
<td>-.174</td>
<td>-.145</td>
</tr>
<tr>
<td>Prosocial – Benefactor</td>
<td>-.202</td>
<td>.830</td>
<td>.057</td>
<td>.194</td>
<td>.000</td>
</tr>
</tbody>
</table>
emerge from the analysis: positive affect, negative affect and normative cognition. As explained in the cognitive coding procedure in order to provide a more fine-grained analysis, I had the independent coders also distinguish between prosocial behavior (e.g., “I would like to help my partner”) and normative social behavior (e.g., “I should help my partner”), as well as positive and negative thoughts of both benefactor and benefit.

Factors were extracted using principle components with a varimax rotation, maximum of 25 iterations. A total of five factors emerged: Positive Thoughts, Prosocial Thoughts, Normative and Negative Thoughts toward the Benefactor, Positive Affect, and Normative Thoughts toward the Benefit. The factor loadings are presented in Table 3 in bold. Loadings in italics represent inverse loading of another factor.

These five separate factors were then combined into new variables and used in the preceding analyses to see if cognition and/or emotion during a social exchange predict behavior toward one’s benefactor (i.e., number of tickets distributed).

**Correlations of Affective & Cognitive Factors.**

A correlation analysis was conducted to see if the five different factors obtained in the factor analysis correlated with each other. Correlation coefficients (i.e., r values) are presented in Table 4. The correlations suggest that positive affect and positive thought are correlated. However, prosocial thought was positively correlated with positive affect but negatively correlated with positive thought.
Table 4

Inter-correlations of Affect & Cognition

<table>
<thead>
<tr>
<th></th>
<th>+ Affect</th>
<th>+ Thought</th>
<th>Prosocial</th>
<th>- &amp; Norm Benefactor</th>
<th>Norm Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Affect</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Thought</td>
<td></td>
<td></td>
<td>.29^</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Prosocial Thought</td>
<td>.21</td>
<td>-.18</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- &amp; Norm Benefactor</td>
<td>-.10</td>
<td>-.02</td>
<td>-.04</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Norm Benefit</td>
<td>.01</td>
<td>.01</td>
<td>.28</td>
<td>.05</td>
<td>---</td>
</tr>
</tbody>
</table>

^p<.10, N=36

Gratitude & Indebtedness Predicting Number of Tickets.

The two independent gratitude scales were combined because they were strongly correlated (r = .80, p = .001). I conducted a hierarchical regression to see if gratitude and indebtedness predict number of tickets distributed. Post-game gratitude was entered in Step 1, and in Step 2, post-game indebtedness was entered. My original prediction was that participants’ gratitude will still remain a significant predictor of reciprocity behavior (number of tickets distributed) in both Step 1 & 2. The overall model for Step 1 was not significant, $F(1,33)=1.81$, $p=.19$, nor was the overall model for Step 2, $F(2,32)=.92$, $p=.41$.

I also examined the individual effects of each predictor variable using the $\beta$ coefficients. Gratitude was not a significant predictor of number of tickets distributed in Step 1, $\beta=.23$, $t=1.35$, $p=.19$. In Step 2, gratitude was not a significant predictor $\beta=.23$, $t=1.34$, $p=.19$, nor was indebtedness, $\beta=.05$, $t=.30$, $p=.77$. 
Positive Affect, Positive Thoughts, Prosocial Thoughts, Normative & Negative Thoughts about the Partner & Normative Thoughts about Benefits Predicting Number of Tickets.

Utilizing the factors from the factor analysis, I examined whether affect and cognition in a social exchange independently predict reciprocity behavior. Specifically, I was interested to see if positive affect would remain a significant predictor after controlling for cognition. In Step 1, I entered positive affect by itself. In Step 2, I entered the remaining five factors: prosocial thoughts, positive thoughts, normative and negative thoughts about the benefactor, and normative thoughts about the benefit. Step 1 was a significant overall model, $F(1, 33)=6.61, p = .02$. Step 2 as an overall model was marginally significant, $F(5,29)=2.51, p = .06$.

I examined each individual factor and its respective association with number of tickets distributed. In Step 1, positive affect was a significant positive predictor of the number of tickets, $\beta =.41, t =2.57, p = .02$. That is, having positive emotions post-game is associated with giving more tickets to the partner. In Step 2, all five factors were entered and positive affect remained significant, although marginally so, $\beta = .33, t = 1.97, p = .06$. Prosocial thoughts also significantly predicted the number of tickets distributed, $\beta =.35, t(5, 29)=2.14, p = .05$. In contrast, positive thoughts, $\beta = -.04, t = -.22, p = .83$, negative and normative thoughts about the partner, $\beta = -.10, t = -.64, p = .53$, and normative thoughts about ticket giving, $\beta = -.03, t = -.21, p = .84$, were not significant predictors of the number of tickets distributed.
Gratitude as an Affective Component.

The following analyses looked to see if differences between gratitude and indebtedness are simply a matter of valence. That is, these analyses explore whether gratitude is associated with both positive feelings and thoughts, whereas indebtedness is associated with negative feelings and thoughts. In respect to this explanation, I conducted regression analyses to see if the differences between gratitude and indebtedness are valence-based or if the difference is rooted in affective versus cognitive processes.

In Step 1, I regressed gratitude on post-game positive affect. The overall model was significant, $F(1, 33)=11.78, p = .003$; positive affect was a significant predictor of gratitude, $\beta = .51, t = 3.43, p = .003$. In the second step of the analysis, positive affect remained a significant predictor of gratitude after controlling for positive thoughts, $\beta=.48, t = 3.03, p = .006$. In contrast, positive thoughts were not a significant predictor of gratitude, $\beta = .13, t = .82, p = .42$.

To see if gratitude is a significant predictor of behavior (i.e., ticket distribution) beyond positive affect, I regressed number of tickets on positive affect and gratitude in a hierarchical regression. In Step 1 I entered positive affect and this model was significant, $F(1, 33) = 6.61, p = .02$. Positive affect is a positive predictor of ticket distribution, ($\beta=.41$). The model for Step 2 remains marginally significant, $F(2, 32) = 3.21, p = .06$. Specifically, positive affect remains a significant predictor of ticket distribution, $\beta = .40, t =2.57, p = .05$, whereas gratitude is not, $\beta = .02, t(32)=.12, p = .91$.
Indebtedness as a Cognitive Component.

An analogous analysis for the indebtedness and cognitive component question is to regress indebtedness on post-game negative affect, and then in a second step add negative thoughts. Because the two negative thoughts loaded differently – negative thoughts of the partner loaded with normative thoughts of the partner, whereas negative thoughts of the ticket loaded inversely with positive thoughts of the ticket – I used both of these variables in Step 2.

The results for both overall models was not significant, $F(1,33) = 2.15, p = .16$ and $F(3,30) = 1.39, p = .27$, respectively. Examining the beta weights of each individual predictor, in Step 1, negative affect was not a significant predictor of indebtedness, $\beta = .25$, $t = 1.47, p = .16$. In Step 2, the same association followed, $\beta = .25, t = 1.42, p = .17$. In Step 2, negative and normative thoughts about the partner was not a significant predictor of indebtedness, $\beta = -.07, t = -.37, p = .71$, nor was negative thoughts about the tickets, $\beta = .22, t = 1.29, p = .21$.

I looked at these data another way; that is, do affective, cognitive, and behavioral components predict overall attitude toward the benefactor and benefit? Also, does gratitude and indebtedness predict attitude? These hierarchical regression analyses are presented below.

Gratitude and Indebtedness Predict Attitude Toward the Benefactor.

In Step 1, I regressed attitude toward the benefactor on gratitude. The overall model was not significant, $F(1,32) = 1.32, p = .26$, and thus gratitude is not a significant predictor of attitude toward the benefactor ($\beta = -.20$). In Step 2, I entered indebtedness as well and
this model was also not significant, $F(2, 31) = 1.06, p = .36$. Neither gratitude [$\beta = -.19, t = -1.12$] or indebtedness [$\beta = .15, t = .90$] were significant predictors of attitude toward the benefactor.

**Affect, Cognition, and Behavior Predict Attitude Toward the Benefactor.**

In contrast to the gratitude and indebtedness prediction of attitude toward the benefactor, I regressed attitude toward the benefactor on the affective, cognitive, and behavioral (i.e., tickets) responses in three steps. The result of this hierarchical regression analysis is presented in Table 4. Recalling that negative statistics actually represent a positive association (i.e., lower numbers on the attitude measure represents more positive attitude), both positive affect and positive thought are significant predictors of attitude toward the benefactor after controlling for other components. As positive affect and thought increases, the more positive the evaluation of the benefactor.

**Gratitude and Indebtedness Predict Attitude Toward the Benefit.**

In Step 1, I regressed gratitude on attitude toward the benefit. The overall model was not significant, $F(1, 32) = .85, p = .36$, and thus gratitude is not a significant predictor of attitude toward the benefit ($\beta = -.16$). In Step 2, I entered indebtedness as well and this model was also not significant, $F(2, 31) = .46, p = .64$. Neither gratitude [$\beta = -.16, t = -.91$] or indebtedness [$\beta = -.05, t = .31$] were significant predictors of attitude toward the benefit.

**Affect, Cognition, and Behavior Predict Attitude Toward the Benefit.**

I regressed attitude toward the benefit on the affective, cognitive, and behavioral (i.e., tickets) responses in three steps. The result of this hierarchical regression analysis is
presented in Table 5. In Step 1, positive affect is a significant predictor of attitude toward the benefit. However, in Step 2, positive thought is the significant predictor whereas positive affect is not. Positive thought remains a significant predictor in Step 3, even though the overall model in Step 3 does not account for significantly more variance than Step 2.

Table 5
Hierarchical Regression of Affect, Cognition, & Behavior Predicting Benefactor Attitude

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>R²</th>
<th>R²∆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td>.23</td>
<td>.23</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.48**</td>
<td>-3.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td>.35</td>
<td>.12</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.34*</td>
<td>-2.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Thought</td>
<td>-.36*</td>
<td>-2.22</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>-.63</td>
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<td></td>
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<tr>
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<td>.12</td>
<td>.76</td>
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<tr>
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<td></td>
<td>.38</td>
<td>.03</td>
</tr>
<tr>
<td>Positive Affect</td>
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<td>.14</td>
<td>.84</td>
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<tr>
<td>Tickets – Behavior</td>
<td>.20</td>
<td>1.14</td>
<td></td>
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</tr>
</tbody>
</table>

N=34. ***p<.001. **p<.01. *p<.05.
Table 6

*Hierarchical Regression of Affect, Cognition, & Behavior Predicting Benefit Attitude*

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>R2</th>
<th>R2A</th>
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<tr>
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<tr>
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<td>-2.77</td>
<td>.19**</td>
<td>.19</td>
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<tr>
<td>Step 2</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
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<td>-1.63</td>
<td>.47**</td>
<td>.28</td>
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<tr>
<td>Positive Thought</td>
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<td>-3.70</td>
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<td></td>
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<tr>
<td>Prosocial Thought</td>
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<td>- .88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative-Norm Thought</td>
<td>.17</td>
<td>1.25</td>
<td></td>
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<tr>
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<td>.00</td>
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<tr>
<td>Positive Affect</td>
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<td>-1.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Thought</td>
<td>-.54***</td>
<td>-3.63</td>
<td></td>
<td></td>
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<td>Prosocial Thought</td>
<td>-.12</td>
<td>-1.21</td>
<td></td>
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<tr>
<td>Negative-Norm Thought</td>
<td>.17</td>
<td>1.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tickets – Behavior</td>
<td>-.01</td>
<td>- .07</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N=34. ***p<.001. **p<.01. *p<.05.
Chapter 4

Study 1

Discussion

As stated in Chapter 2 & 3, caution should be used when interpreting the results from this study. As predicted, people reported more gratitude after playing the distribution game compared to their baseline gratitude. Post-game indebtedness, however, did not change significantly after the distribution game. Coupling these two results lends further credibility to the distribution game as a means for inducing gratitude and not indebtedness. In summary, the distribution game was successful at inducing a grateful state beyond what one would experience in daily living.

In order to explore other possible changes before and after the distribution game, exploratory analyses examined pre and post-game positive and negative affect, as well as sex differences. Part of this dissertation examined differences between cognitive and emotional responses during a social exchange. Interestingly, the distribution game seemed to reduce both positive and negative affect compared to individuals’ baseline levels, yet gratitude increased. One possible explanation is that, in general, some people may have resolved their affective response to the game through the distribution of tickets (i.e.,
behavior). Another is, however, that there is some overlap between gratitude and positive affect. While gratitude may increase compared to baseline and positive affect may decrease, the general positive affect may include gratitude, as well as other positive emotions, and these collectively contribute to overall behavior. Indeed, when I conducted the regression analysis in which number of tickets (i.e., behavior) is regressed on positive affect and gratitude, I found that as positive affect increased, the number of tickets distributed significantly increased. However, after controlling for positive affect, gratitude is not a significant predictor of number of tickets distributed. Referring to the analyses in which number of tickets is regressed on gratitude, we see that the trend is positive, but the relationship is not significant between gratitude and ticket distribution – gratitude and positive affect are closely associated, but positive affect is better at predicting actual behavior. On a final note, there were no gratitude or indebtedness differences between men and women.

In addition to comparing gratitude to positive affect, part of this dissertation’s focus was to assess how well gratitude and indebtedness predict behavior, namely reciprocity behavior. Based on past research (Tsang, 2007), I predicted that gratitude should be positively associated with reciprocity behavior after controlling for indebtedness. While the statistical results of testing this hypothesis was not significant, the trend of the data was in the predicted direction, and for a small sample size seems promising for future research. In general, gratitude seems to be a reasonably good predictor of reciprocity behavior when compared to indebtedness.
To examine the possibility that gratitude and indebtedness map onto affective and cognitive components of attitude during social exchange, both affective and cognitive measures obtained during the distribution game were entered into an exploratory factor analysis (and thus caution should be used in interpreting these factors and subsequent findings). There were five different factors that emerged: Positive Thoughts, Prosocial Thoughts, Normative and Negative Thoughts toward the Benefactor, Positive Affect, and Normative Thoughts toward the Benefit. Specifically, positive cognition and positive affect seem to be different components of how people respond to a benefit. Negative and normative thoughts about the benefactor are different from normative thoughts about the benefit, suggesting that thinking about a benefit in a social exchange is distinct from thinking about the benefactor providing the benefit. This suggests that when evaluating a social exchange, thoughts about what one should do and negative thoughts are of a similar quality. In other words, negative thoughts and thoughts about rules and normative principles coincide with one another when thinking about a person who was kind. In a different respect, when a person considers the benefit itself, normative thoughts and negative thoughts are not of the same quality. The thinking process about benefactors is, in part, different than a person’s thinking process about the benefit, which indicates that cognitively people separate the evaluation of the person and the object in regards to negative and normative qualities. Again, the results from this factor analysis should be interpreted with caution – however, the preliminary finding suggests that the affective and cognitive measures used in this study load onto separate factors.
I also conducted a correlation analysis to see if the affective and cognitive factors from the exploratory factor analysis were related. Positive affect was positively correlated with positive and prosocial thought. However, positive thought and prosocial thought were negatively correlated, suggesting that evaluating the benefit and benefactor positively was different from evaluating whether the benefactor or benefit was helpful.

In Round 3 of the distribution game, participants had the opportunity to distribute the 10 tickets for that round. I regressed the number of tickets in Round 3 of the distribution on these five factors (i.e., affective and cognitive components). Specifically I entered the positive affect component in Step 1, and the remaining factors in Step 2. The result was that both positive affect and prosocial cognitions were associated with increased ticket distribution. It is interesting to note that positive affect and positive thoughts not only load differently in a factor analysis, but are distinct when it comes to predicting actual behavior. It is specific thoughts about the overall exchange (e.g., I want to help my partner) and general good feelings that are indicative of giving more tickets rather than general good thoughts about the partner (e.g., I like my partner). In contrast, normative thoughts (e.g., I ought to do something for my partner) and negative thoughts (e.g., I don’t care for my partner) are not associated with giving more or fewer tickets.

To test whether my theory that gratitude is more directly related to measures of positive affect than positive thinking, I regressed gratitude on positive affect and positive thoughts. I found that positive affect was positively associated with gratitude but that positive thoughts were not. This replicates previous work that shows gratitude and positive affect as correlates (McCullough, et al., 2001). Gratitude is more closely associated with
positive affect rather than positive thoughts, suggesting that basic mechanisms of how gratitude is experienced lies within affective processes.

I was interested to see if indebtedness was more directly related to cognitive processes, namely normative thought, than it was to affect. I regressed indebtedness on negative affect, negative and normative thoughts about the partner, and negative thoughts about the ticket. None of the predictor variables accounted for a significant amount of variance. This suggests that neither negative affect nor negative thoughts are predictive of indebtedness. However, in examining the trend and considering the sample size, what these data indicate is that indebtedness is positively associated with both negative affect and negative thoughts about the tickets. Indebtedness seems to be a mixture of both affect and cognition in this particular social exchange task. These findings suggest that gratitude and indebtedness are distinct psychological experiences, and that they are related to different psychological processes.

Finally, I examined the associations of gratitude and indebtedness to attitude toward the benefactor and the benefit. In comparison, I also investigated whether affect, cognition, and behavior were associated with attitude toward the benefactor and benefit – the tripartite model of attitude. In general, I did not find significant relationships between gratitude or indebtedness and overall attitude toward the benefactor or benefit. However, when using the three component model, I found that positive affect and thought were predictive of attitude toward the benefactor, whereas positive thought alone was predictive of attitude toward the benefit. That is, when given a benefit in kind, one’s attitude toward the giver is dictated by both affect and cognition, whereas cognition plays a significant role
in forming an attitude toward the benefit itself. It’s interesting to note these differences, as it may be the case that positive affect and cognition predict evaluating objects that one may want to approach or avoid in the future, hence a more mixed, richer evaluation. Another explanation is that the benefactor is a person, and thus a social object, and it is possible that evaluations of people access and utilize both affective and cognitive systems. However, Breckler (1984) in his test of the tripartite model used a snake as his object of evaluation – snakes are not commonly perceived to be social objects. However, what a snake and a social exchange partner do share in common as objects of evaluation is the potential outcome for future interaction; many people wish to avoid these interactions (or not) – there may be a connection to avoidance motivation. In turn, the number of components pertinent to an evaluation of an object may be associated, then, with the strength and/or accessibility of the attitude.

A concluding remark on distinguishing gratitude, indebtedness, and their relative psychological processes, post-gratitude and post-indebtedness were not significantly correlated ($r = -.04$). Pre-test gratitude and indebtedness also were not significantly correlated, but the relationship was direct ($r = .27$). In past research, gratitude and indebtedness have been mildly, negatively correlated (Mathews & Green, in press; Tsang, 2007). Coupled with the additional analyses, gratitude and indebtedness seem to be distinct experiences arising from and predictive of different behaviors and psychological experiences. However, when trying to predict attitudes, affective and cognitive responses seem to be better predictors of evaluations in social exchange.
In Study 2, I wanted to re-test my hypotheses again, only this time manipulating the type of note received prior to Round 3: one that should elicit gratitude, one that should elicit indebtedness or simply stating that the tickets are awarded randomly (control).
Chapter 5

*Study 2*

Method

Study 2's procedures were precisely the same as Study 1 barring an exception. Study 2 will include a between-subjects factor: type of benefit received (game condition). Participants were randomly assigned to one of three conditions: gratitude, indebtedness, or chance (control) condition. The gratitude condition involved the same instructions as Study 1, as the benefit in Study 1 was given in kind. The indebtedness condition involved the same instructions as the gratitude condition except the note from the fictitious partner that said “I see you received fewer tickets in the first round. I'll give you some extra now if you help me out later.” The chance condition included a note include that simply stated that the tickets are distributed at random.

The purpose of the second study was to confirm and replicate findings from Study 1 and introduced a potential method of manipulating gratitude versus indebtedness. This study specifically added an important feature to the gratitude and indebtedness literature by providing an indebtedness manipulation with a direct, behavioral dependent variable. Previous work has only been correlational by design (e.g., Watkins et al., 2006) or has not
involved the use of an indebtedness manipulation (e.g., Tsang, 2007) to show differences between gratitude and indebtedness.

A power analysis conducted for a 2 x 3 mixed model, $\alpha = .05$, $\eta^2 = .10$, and $1 - \beta = .80$ suggests a sample of approximately 134 people. As explained in the beginning of Chapter 2, circumstances arose that warranted completing data collection for the dissertation at the end of Spring, 2009 semester. The following sections should hence be interpreted with caution.

Participants

There were sixty six Virginia Commonwealth University undergraduates (50% female) who completed both pre and post-game measures for partial course credit. Of the sixty six who completed both parts of the study, six were dropped from the data analysis because they failed to follow instructions. The sample was reasonably diverse (25 Caucasian, 18 Asians, 15 African Americans, 3 Latina/o, & 9 that identified as mixed race); mean age was 20.52 ($SD = 3.51$).

Materials

The same measures and materials used for Study 1 were used for Study 2.

Design and Procedure

This study, again, was a partial replication of a study designed by Tsang (2007). Recall in this study and in Study 1 that there was a benefit given in kind and then grateful and indebtedness responses were examined. Thus, the type of benefit given did not vary across participants. In Study 2, however, participants were randomly assigned to one of three conditions: gratitude, indebtedness or chance condition. Again, participants signed up
for the study (“Games with Partners”) and completed pre-test measures of gratitude and indebtedness on SONA, and followed the general procedures used in Study 1.

The same three undergraduate research assistants ran Study 2, and followed the same script except for the part with the manipulated variable. As in the first study, the first round started off with each participant receiving three raffle tickets and the partner receiving seven. The partner in Round 2 distributed the tickets the same as in Study 1: the participant received nine tickets and the partner keep one. What varied, however, is the note that accompanies the nine tickets. In the gratitude condition, the note read the same as in Study 1: “That first round was not good for you. Here are a few extra tickets.” Those participants assigned to the indebtedness condition received a note that states “That first round was not good for you. I will give you some extra tickets now if you help me out later.” The chance condition received a note indicating that the tickets were distributed at random, thus acting as a control condition. That is, participants were instructed that they received the tickets by chance and that the partner had no role in distributing the tickets.

As with Study 1, the Round 3 distribution gave the participant the opportunity to distribute raffle tickets. Round 3 was critical because it served, again, as a behavioral measure of reciprocity. After the Round 3 distribution, participants completed the battery of measures described as in Study 1.

Hypotheses – Study 2

1. I predicted a main effect for the pre and post-game gratitude and indebtedness: after the distribution game (post test), participants would report greater levels of gratitude and indebtedness compared to the pre-game conditions.
2. I also predicted a main effect for the game condition: participants would report more gratitude in the gratitude condition compared to the indebtedness and chance condition, and participants would report more indebtedness in the indebtedness condition compared to the gratitude and chance conditions.

3. Additionally, I predicted significant interactions. Participants’ post-game gratitude scores would be significantly higher than the pre-game gratitude scores. Also, participants would report more indebtedness in their post-game scores in the indebtedness condition than the pre-game indebtedness scores.

4. I predicted that separate factors would emerge from the analysis: positive affect, negative affect, normative cognition, and prosocial thought.

5. I predicted that positive affect would be directly associated with gratitude across all conditions and that indebtedness would be directly associated with normative cognition across all conditions.

6. Analyses were conducted to examine mean differences between positive affect and gratitude and indebtedness and normative cognition.
Chapter 6

Study 2

Results

The purpose of Study 2 was to see if manipulating gratitude and indebtedness would result in respective changes in gratitude, indebtedness, affect, and cognition toward the benefactor and benefit, as well as general attitude toward the benefit and benefactor. As a replication and extension of Study 1, I tested the hypotheses that there are differences between affective and cognitive responses toward a benefit and a benefactor during social exchange, and that these differences are associated with gratitude and indebtedness respectively. In addition, I examined whether these affective and cognitive components predict social exchange behavior under different circumstances (e.g., benefit given in kind or benefit given with obligation). The final analyses tested a three component structure of attitude (affective, cognitive, and behavioral) toward benefits and benefactors in social exchange. The following results are exploratory given the aforementioned sample issues.

Manipulation Check – Obligation and Appreciation of Partner.

I used two supplementary questions in Study 2 to assess appreciation (gratitude) and obligation (indebtedness) toward the partner. These questions were specific to the distribution game (e.g., “How much did you appreciate your partner?” and “How obligated are you toward your partner?”), and therefore I did not gather pre-game measurement for
these variables. The ANOVA for appreciation was significant, $F(2,56) = 6.73, p=.002, \eta^2=.19$, a moderate effect. In this study, 19% of the variability in appreciation toward one’s partner is due to the randomly assigned condition. A Tukey HSD test was conducted to examine mean differences. Participants in the gratitude ($M=3.42$) and indebtedness ($M=3.50$) conditions reported more appreciation for their partner than the control condition ($M=2.35$). However, I found no difference in appreciation for the partner between the gratitude and indebtedness conditions. I then conducted an ANOVA on reported obligation toward the partner across the three different conditions. The ANOVA for obligation was not significant, $F(2, 57) = 1.44, p=.25, \eta^2=.05$, a weak effect. In this study, 5% of the variability in obligation toward the partner is due to the assigned condition. I found no significant difference between the gratitude ($M=2.30$), indebtedness ($M=2.40$) or the control condition ($M=1.75$).

*Gratitude Questionnaire (GQ-6).*

I conducted a two (pre and post) by three (gratitude, indebtedness or control condition) mixed ANOVA to examine mean differences across time of measurement and between conditions of GQ-6 scores. Means for each condition are presented in Table 6. I found a significant main effect for the pre and post-test GQ-6 scores, $F(1,57) = 8.55, p=.005, \eta^2=.13$, a moderate effect. In this study 13% of the variability in GQ-6 scores is due to the time of measurement after controlling for individual differences. I found no significant main effect for condition, $F(2, 57) = .10, p=.90, \eta^2=.003$, a very weak effect. Only .3% of the variability in GQ-6 scores is due to the assigned condition.
However, there was a marginally significant interaction between the time of measurement and condition, $F(2,57) = 2.53, p=.09$, $\eta^2=.08$, a weak effect, indicating that 8% of the variability in GQ-6 scores is due to the interaction between time and condition.

When examining the simple effects, I found post-test gratitude scores are higher than the pre-test gratitude scores in the gratitude condition. In contrast, the pre and post-test gratitude scores in the indebtedness and control conditions do not seem to be different.

Table 7

Means for GQ-6 Measure

<table>
<thead>
<tr>
<th>Condition</th>
<th>Gratitude</th>
<th>Indebtedness</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>5.63\textsuperscript{b}</td>
<td>5.78</td>
<td>5.65</td>
</tr>
<tr>
<td>Post-test</td>
<td>6.12\textsuperscript{b}</td>
<td>5.78</td>
<td>5.98</td>
</tr>
<tr>
<td></td>
<td>5.88</td>
<td>5.78</td>
<td>5.79</td>
</tr>
</tbody>
</table>

\textsuperscript{a} = p < .01. \textsuperscript{b} = p < .10.

Gratitude, Resentment, & Appreciation Test (GRAT).

I also examined the GRAT scores using a two (pre and post) by three (gratitude, indebtedness, or control) mixed ANOVA. Means are presented in Table 7. Similar to the GQ-6 test, I found a significant main effect for time of measurement, $F(1,55) = 7.21$, $p=.01$, $\eta^2=.12$, a moderate effect, indicating that 12% of the variability in GRAT scores is due to the time of measurement after controlling for individual differences. There was no significant main effect for condition, $F(2,55) = .62, p=.54$, $\eta^2=.02$, a weak effect, with 2% of the variability in GRAT scores accounted by the condition.
I did, however, find a marginal interaction effect between time of measurement and condition for GRAT scores, $F(2,55) = 2.41$, $p = .10$, $\eta^2 = .08$, a weak effect. In this study, 8% of the variability in GRAT scores is accounted by the interaction between time and condition. When examining the simple effects, the mean GRAT scores in the control condition are higher post-test when compared to pre-test. This trend is not significant for the gratitude and indebtedness conditions.

Table 8

*Means for GRAT Measure*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Gratitude</th>
<th>Indebtedness</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>6.36</td>
<td>6.72</td>
<td>6.18$^b$</td>
</tr>
<tr>
<td>Post-test</td>
<td>6.60</td>
<td>6.71</td>
<td>6.63$^b$</td>
</tr>
<tr>
<td></td>
<td>6.48</td>
<td>6.71</td>
<td>6.41</td>
</tr>
</tbody>
</table>

$a = p < .01$. $b = p < .10$.

*Indebtedness Scale (IS).*

Finally, I used two-within (pre and post) by three-between (gratitude, indebtedness, or control) mixed ANOVA to examine changes in indebtedness scores. Means are presented in Table 8. I found neither a significant main effect for time of measurement, $F(1,52) = 1.06$, $p = .30$, $\eta^2 = .02$, a weak effect, with 2% of the variability in indebtedness scores accounted by the time of measurement, nor a significant main effect for condition, $F(2,52) = .06$, $p = .94$, $\eta^2 = .002$, a weak effect, with .2% of the variability in indebtedness scores accounted by the condition. In addition, I found no significant interaction, $F(2,52) =$
.37, \( p=.72, \eta^2=.01 \), a weak effect. In this study, 1% of the variability in indebtedness scores is accounted by the interaction between time of measurement and condition.

Table 9

*Means for IS Measure*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Gratitude</th>
<th>Indebtedness</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>4.28</td>
<td>4.30</td>
<td>4.35</td>
</tr>
<tr>
<td>Post-test</td>
<td>4.23</td>
<td>4.13</td>
<td>4.29</td>
</tr>
<tr>
<td></td>
<td>4.26</td>
<td>4.22</td>
<td>4.32</td>
</tr>
</tbody>
</table>

*Cognitive Measurement Coding*

Similar to Study 1, I had two independent coders rate the writings about the benefit and benefactor in Study 2. I had the raters code for the following categories: total number of thoughts, positive thoughts, negative thoughts, prosocial thoughts, and normative thoughts. Inter-rater reliabilities (i.e., correlation coefficients) are presented in Tables 9 & 10.

Table 10

*Inter-rater reliabilities for Benefactor Categories*

<table>
<thead>
<tr>
<th>Coder 1</th>
<th>Coder 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>.97</td>
</tr>
<tr>
<td>Positive</td>
<td>.96</td>
</tr>
<tr>
<td>Negative</td>
<td>.78</td>
</tr>
<tr>
<td>Normative</td>
<td>.94</td>
</tr>
<tr>
<td>Prosocial</td>
<td>.65</td>
</tr>
</tbody>
</table>
Table 11

*Inter-rater Reliabilities for Benefit Categories*

<table>
<thead>
<tr>
<th>Category</th>
<th>Coder 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coder 1 Total</td>
<td>.91</td>
</tr>
<tr>
<td>Coder 1 Positive</td>
<td>.90</td>
</tr>
<tr>
<td>Coder 1 Negative</td>
<td>.90</td>
</tr>
<tr>
<td>Coder 1 Normative</td>
<td>.89</td>
</tr>
<tr>
<td>Coder 1 Prosocial</td>
<td>.81</td>
</tr>
</tbody>
</table>

I found the reliabilities between the two coders to be good. As in Study 1, I proceeded with data analysis by averaging the coders’ responses into one measure; this averaged measure was then used to create a ratio (e.g., prosocial thoughts of benefit/total thoughts of benefit). I used these ratios to conduct a factor analysis to see if cognitive and affective responses during Study 2’s post-test phase would load into different factors (Hypothesis 4).

*Exploratory Factor Analysis*

In this study, I conducted a factor analysis to see if affective and cognitive responses load into separate factors. The factor loadings are presented in Table 11 in bold. Loadings in italics represent inverse loading on another factor. As with Study 1, factors were extracted using principle components with a varimax rotation, maximum of 25 iterations, and just as with Study 1, I interpret these factor loadings cautiously due to sample size. A total of five factors emerged: Normative Thoughts, Negative Thoughts, Positive Affect, Prosocial Thoughts, and Negative Affect.
Table 12

*Factor Analysis of Affective & Cognitive Responses to a Benefit & Benefactor*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Normative</th>
<th>- Thought</th>
<th>+ Affect</th>
<th>Prosocial</th>
<th>- Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect</td>
<td>.101</td>
<td>-.071</td>
<td>.778</td>
<td>.080</td>
<td>-.131</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>.041</td>
<td>.026</td>
<td>-.046</td>
<td>.085</td>
<td>.902</td>
</tr>
<tr>
<td>Positive – Benefit</td>
<td>-.195</td>
<td>-.201</td>
<td>.672</td>
<td>-.150</td>
<td>.457</td>
</tr>
<tr>
<td>Negative – Benefit</td>
<td>-.279</td>
<td>.645</td>
<td>-.206</td>
<td>-.277</td>
<td>-.281</td>
</tr>
<tr>
<td>Normative – Benefit</td>
<td>.858</td>
<td>-.106</td>
<td>-.147</td>
<td>-.056</td>
<td>-.128</td>
</tr>
<tr>
<td>Prosocial – Benefit</td>
<td>-.269</td>
<td>.188</td>
<td>.218</td>
<td>.814</td>
<td>-.019</td>
</tr>
<tr>
<td>Positive – Benefactor</td>
<td>-.269</td>
<td>-.766</td>
<td>-.113</td>
<td>-.086</td>
<td>.004</td>
</tr>
<tr>
<td>Negative – Benefactor</td>
<td>-.082</td>
<td>.608</td>
<td>-.341</td>
<td>.016</td>
<td>.154</td>
</tr>
<tr>
<td>Normative – Benefactor</td>
<td>.774</td>
<td>.168</td>
<td>.234</td>
<td>-.117</td>
<td>.177</td>
</tr>
<tr>
<td>Prosocial – Benefactor</td>
<td>-.080</td>
<td>-.235</td>
<td>-.230</td>
<td>.728</td>
<td>.107</td>
</tr>
</tbody>
</table>

*Correlations of Affect & Cognition Factors.*

I conducted a correlation analysis to see if the affective and cognitive factors correlated. Table 13 presents the $r$ values. In general, there were no significant correlations.
Table 13

*Inter-correlations of Affect & Cognition*

<table>
<thead>
<tr>
<th></th>
<th>+ Affect</th>
<th>- Affect</th>
<th>Normative Thought</th>
<th>- Thought</th>
<th>Prosocial Thought</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Affect</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Affect</td>
<td>-.02</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative Thought</td>
<td>.15</td>
<td>.05</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Thought</td>
<td>-.19</td>
<td>-.12</td>
<td>-.13</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Prosocial Thought</td>
<td>-.01</td>
<td>.11</td>
<td>-.15</td>
<td>-.16</td>
<td>---</td>
</tr>
</tbody>
</table>

*N = 60*

*Condition and Affective & Cognitive Responses to the Distribution Game.*

Before comparing affective and cognitive components to gratitude and indebtedness, I conducted an ANOVA to see if the conditions differed in their affective and cognitive responses to the game. Means, *F* ratios, *p* values, and effect sizes for the five different variables are presented in Table 14. One of these analyses was marginally significant – people in the gratitude condition wrote more normative thoughts than the control condition.

Table 14

*Descriptive and Inferential Statistics for Affective and Cognitive Responses*

<table>
<thead>
<tr>
<th></th>
<th>Gratitude</th>
<th>Indebtedness</th>
<th>Control <em>F</em></th>
<th><em>p</em></th>
<th><em>η</em>²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect</td>
<td>2.76</td>
<td>2.83</td>
<td>2.45</td>
<td>.92</td>
<td>.41</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>1.70</td>
<td>1.47</td>
<td>1.27</td>
<td>1.69</td>
<td>.20</td>
</tr>
<tr>
<td>Normative Thought</td>
<td>.18</td>
<td>.11</td>
<td>.04</td>
<td>2.89</td>
<td>.06</td>
</tr>
<tr>
<td>Negative Thought</td>
<td>.07</td>
<td>.05</td>
<td>.11</td>
<td>.91</td>
<td>.41</td>
</tr>
<tr>
<td>Prosocial Thought</td>
<td>.02</td>
<td>.03</td>
<td>.01</td>
<td>.47</td>
<td>.63</td>
</tr>
</tbody>
</table>

*N = 60. *p* < .10.
Affect & Cognition Predicting Gratitude.

I performed a hierarchical regression analysis to see if affective and cognitive responses were associated with gratitude. In Step 1, I entered positive and negative affect. Overall, the model for the affective measures was significant, $F(2,54) = 3.38, p=.04$. $\beta$ weights and inferential statistics are presented in Table 13.

Positive affect, in particular, is a significant, positive predictor of gratitude, which replicates previous findings (McCullough, et al., 2001). Cognitive responses were entered into Step 2, and this overall model was not significant, $F(5,51) = 1.76, p=14$. The cognitive responses across conditions are not significant predictors of gratitude, however in Step 2, positive affect remained a significant predictor of gratitude.

Table 15

Hierarchical Regression of Affect & Cognition Predicting Gratitude Scales

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$R^2$</th>
<th>$R^2\Delta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>.30*</td>
<td>2.36</td>
<td>.11</td>
<td>.11*</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>.15</td>
<td>1.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td>.15</td>
<td>.04</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>.29*</td>
<td>2.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Affect</td>
<td>.16</td>
<td>1.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative Thought</td>
<td>-.01</td>
<td>-.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Thought</td>
<td>-.06</td>
<td>-.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial Thought</td>
<td>-.19</td>
<td>-1.44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$N=57$. *$p<.05$. 
Affect & Cognition Predicting Indebtedness.

I conducted a hierarchical regression analysis to see if affective and cognitive responses across conditions were predictive of reported indebtedness. As with the test of affective and cognitive responses predicting gratitude, I entered affective measures (positive and negative affect) in Step 1. The overall model for Step 1 was not significant, $F(2,54) = .09, p=.91$. Examining the statistics presented in Table 14, positive and negative affect are not significant predictors of indebtedness. In Step 2, I entered the cognitive responses and this model was also not significant, $F(5,51) = .52, p=.76$. The cognitive responses, across conditions, are not significantly predictive of indebtedness. However, in contrast with the same test of gratitude, the trend is that the addition of cognitive responses improves the overall model (although not significantly so).

Table 16

Hierarchical Regression of Affect & Cognition Predicting Indebtedness Scale

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$R^2$</th>
<th>$R^2\Delta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.007</td>
<td>-.05</td>
<td></td>
<td>.003</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>.05</td>
<td>.43</td>
<td></td>
<td>.049</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td>.045</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.03</td>
<td>-.18</td>
<td></td>
<td>.045</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>.06</td>
<td>.42</td>
<td></td>
<td>.045</td>
</tr>
<tr>
<td>Normative Thought</td>
<td>-.10</td>
<td>-.69</td>
<td></td>
<td>.045</td>
</tr>
<tr>
<td>Negative Thought</td>
<td>-.16</td>
<td>-1.12</td>
<td></td>
<td>.045</td>
</tr>
<tr>
<td>Prosocial Thought</td>
<td>-.17</td>
<td>-1.21</td>
<td></td>
<td>.045</td>
</tr>
</tbody>
</table>
The next section of analyses focuses on predicting behavior (i.e., number of tickets distributed) from affect and cognition, as well as gratitude and indebtedness. Are affective and cognitive responses related to behavior? Equally so, are gratitude and indebtedness associated with social exchange behavior?

*Number of Tickets Due to Condition.*

First, before examining affective and cognitive components as predictors of behavior, I conducted a one-way between subjects ANOVA to see if the number of tickets distributed in Round 3 by participants was different across conditions. The ANOVA was not significant, $F(2,57) = .92, p=.42, \eta^2=.03$, a weak effect. In this study 3% of the variability in the number of tickets distributed was due to the randomly assigned condition. The number of tickets did not significantly vary across the gratitude (M=7.50), indebtedness (M=7.10), or control conditions (M=6.25).

*Attitude Toward Benefit and Benefactor.*

Before investigating models of predicting attitude, I averaged the items from the semantic differential scales for both the benefit and benefaction to create an overall attitude toward the benefit and benefactor. For these analyses concerning attitude, lower values represent positive attitude whereas higher values represent negative attitude. I then conducted an ANOVA on reported general attitude toward the benefactor and benefit. The ANOVA for benefit was marginally significant, $F(2,57) = 2.86, p=.07, \eta^2=.09$, a weak effect. In this study, 9% of the variability in benefit attitude is due to the condition. Examining the means of the groups and recalling that lower numbers correspond to positive attitude, the trend is that the overall attitude toward the tickets in the Control
condition (\(M=3.69\)) is more negative than the Indebtedness condition (\(M=2.83\)). There is no significant difference between the Gratitude condition (\(M=3.18\)) and the Control or Indebtedness conditions. The ANOVA for benefactor was significant, \(F(2, 55) = 15.12, p=.001, \eta^2=.35\), a strong effect. In this study, 35% of the variability in benefactor attitude is due to the condition. A Tukey HSD was conducted to examine mean differences. Both the Indebtedness (\(M=2.31\)) and Gratitude (\(M=2.53\)) conditions reported a more positive attitude toward the benefactor than the Control condition (\(M=3.84\)). There was no significant difference between the Gratitude and Indebtedness conditions.

*Gratitude and Indebtedness Scales Predicting Overall Attitude toward Benefactor Across Conditions.*

I regressed overall attitude toward the benefactor on gratitude and indebtedness across conditions. I entered each independent variable in two separate steps. In Step 1, I entered gratitude and the overall model was not significant, \(F(1,56) = 1.61, p=.21\). Gratitude was not a significant predictor of attitude toward the benefactor \(\beta = -.17, t =-1.27, p=.21\).

In Step 2, I entered indebtedness and this model was also not significant, \(F(2,55) = .81, p=.45\). Neither gratitude [\(\beta = -.17, t =-1.26, p=.21\)] nor indebtedness [\(\beta = -.03, t =-.21, p=.84\)] were significant predictors of attitude toward the benefactor.

*Gratitude and Indebtedness Scales Predicting Overall Attitude toward Benefit Across Conditions.*

I also examined models of predicting attitude toward the benefit across conditions. In Step 1, I entered gratitude and in Step 2 I entered indebtedness. The model for Step 1
was not significant, \( F(1,58) = .67, p=.42; \) gratitude was not a significant predictor of attitude toward the benefit, \( \beta = -.11, t= -.82, p=.42. \) Step 2 was also not significant, \( F(2,57)=1.42, p=.25. \) Neither gratitude \( \beta = -.11, t = -.11, p=.43 \) nor indebtedness \( \beta = -.19, t =-1.47, p=.15 \) were significant predictors of attitude toward the benefit.

**Affect, Cognition, and Behavior Predicting Overall Attitude Toward Benefactor.**

I conducted a hierarchical regression to test the tripartite theory of attitudes on a social exchange situation. That is, are there three components (i.e., affective, cognitive, and behavioral) that comprise overall attitude toward a benefactor in a social exchange? I examined this across conditions for a general test of the model. \( \beta \) weights and inferential statistics for each step are presented in Table 15. All three models were significant, with a marginally significant change in variance accounted for from Step 1 to Step 2, and a significant change between Step 2 and Step 3. This indicates that Step 3, which includes affective, cognitive, and behavioral measures, is a good model. In examining Step 3 closely, it is noted that positive affect and the number of tickets distributed are significant, positive predictors of a positive attitude toward a benefactor (recalling that lower numbers on the attitude measure indicates a more positive attitude – thus as this number shifts down (more positive), positive affect increases and more tickets are distributed). Also, it should be noted that normative thought is a marginal, positive predictor of positive attitude toward the benefactor.
Table 17

Hierarchical Regression of Affect, Cognition, & Behavior Predicting Benefactor Attitude

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>$R^2$</th>
<th>$R^2\Delta$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.42***</td>
<td>-3.38</td>
<td>.205</td>
<td>.205***</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>-.18</td>
<td>-1.47</td>
<td>.205</td>
<td>.205***</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.33**</td>
<td>-2.89</td>
<td>.32</td>
<td>.12*</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>-.14</td>
<td>-1.13</td>
<td>.32</td>
<td>.12*</td>
</tr>
<tr>
<td>Normative Thought</td>
<td>-.16</td>
<td>-1.34</td>
<td>.32</td>
<td>.12*</td>
</tr>
<tr>
<td>Negative Thought</td>
<td>.28*</td>
<td>2.28</td>
<td>.32</td>
<td>.12*</td>
</tr>
<tr>
<td>Prosocial Thought</td>
<td>-.04</td>
<td>-.34</td>
<td>.32</td>
<td>.12*</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.41***</td>
<td>-3.42</td>
<td>.38</td>
<td>.06*</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>-.11</td>
<td>-.92</td>
<td>.38</td>
<td>.06*</td>
</tr>
<tr>
<td>Normative Thought</td>
<td>-.21^</td>
<td>-1.77</td>
<td>.38</td>
<td>.06*</td>
</tr>
<tr>
<td>Negative Thought</td>
<td>.37**</td>
<td>2.93</td>
<td>.38</td>
<td>.06*</td>
</tr>
<tr>
<td>Prosocial Thought</td>
<td>-.05</td>
<td>-.39</td>
<td>.38</td>
<td>.06*</td>
</tr>
<tr>
<td>Tickets – Behavior</td>
<td>-.28*</td>
<td>-2.14</td>
<td>.38</td>
<td>.06*</td>
</tr>
</tbody>
</table>

N=55. ^p<.10. *p<.05. **p<.01. ***p<.001.

Affect, Cognition, and Behavior Predicting Overall Attitude Toward Benefit.

As with the overall attitude toward the benefactor, I also examine overall attitude toward the benefit (i.e., ticket) with the tripartite theory of attitude using hierarchical regression. β weights and inferential statistics for each step are presented in Table 18. Each step of the test was significant, with a marginally significant $R^2$ change occurring between
Step 1 and Step 2, but no significant change between Step 2 and Step 3. This indicates that of the three models, the Step 2 model (affect and cognition) may be the best model for predicting attitude toward benefits (in comparison with Step 3, the tripartite model).

Table 18

*Hierarchical Regression of Affect, Cognition, & Behavior Predicting Benefit Attitude*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$R^2$</th>
<th>$R^2\Delta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.46***</td>
<td>-3.86</td>
<td>.24</td>
<td>.24***</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>-.18</td>
<td>-1.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td>.34</td>
<td>.10^</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.40**</td>
<td>-3.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Affect</td>
<td>-.13</td>
<td>-1.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative Thought</td>
<td>-.14</td>
<td>-1.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Thought</td>
<td>.21^</td>
<td>1.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial Thought</td>
<td>-.17</td>
<td>-1.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td></td>
<td>.35</td>
<td>.01</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>-.43***</td>
<td>-3.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Affect</td>
<td>-.12</td>
<td>-1.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative Thought</td>
<td>-.16</td>
<td>-1.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Thought</td>
<td>.25*</td>
<td>2.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial Thought</td>
<td>-.17</td>
<td>-1.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tickets – Behavior</td>
<td>-.13</td>
<td>-1.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*N=57. $^*p<.10. ^*p<.05. **p<.01. ***p<.001.*
Chapter 7

Study 2

Discussion

Study 2 used a mixed factorial design to test the tripartite theory of attitudes in a social exchange situation. Part of this overall test was whether gratitude and indebtedness are associated with emotional and cognitive components of attitude toward a benefit and benefactor. Study 2 also looked at how gratitude and indebtedness predict behavior and overall attitude toward the benefactor and benefit involved in the distribution game. Finally, I examined whether affect, cognition, and behavior were associated with overall attitude toward the benefactor and benefit. Findings from this study, due to insufficient power, should be interpreted with caution.

The results of Study 2 showed that people reported more gratitude after participating in the distribution game compared to baseline. This finding was, however, not unique to the Gratitude condition – people reported a significant amount of appreciation in both the gratitude and indebtedness conditions compared to the control. Thus, the use of different messages between rounds of the distribution game did not result in differing amount of gratitude in the experimental conditions, but showed that the two experimental conditions are significantly different from the control condition. I also examined obligation as a means of checking the manipulation; there were no significant differences between the
groups. However, in examining the group means, the indebtedness condition did report the highest obligation mean, especially in comparison to the control condition. Thus, overall, the trend for the indebtedness condition is to report greater obligation toward the partner. The significant findings and trends revealed support the general objective of the study design.

The factor analysis conducted in Study 2 showed that there were five factors to account for the responses across conditions: positive affect, negative affect, normative thought, negative thought, and prosocial thought. These factor loadings are different from the factor loadings in Study 1 but due to the power issue any further comparison would be speculative and not conclusive. Given the constraints of the sample size for both studies, interpreting the differences between the factor analyses was unwarranted.

I then conducted several hierarchical regression analyses to see if the affective and cognitive components predict gratitude and indebtedness differently. I found that positive affect was a significant predictor of gratitude. This finding was supported even when the cognitive component of attitude was entered into the equation. In fact, the model which included both affective and cognitive components was not a significant model of gratitude, whereas the affective component alone was. This finding supports theory that gratitude is associated with the affective component of attitude, and builds on previous research which states that gratitude is a positive emotion (McCullough, et al, 2001). In contrast, neither the affective or cognitive components were predictive of indebtedness. However, in examining the trend across steps of the regression, the overall model predicting indebtedness improved when the cognitive components were added to the equation.
Combining the models of affect and cognition predicting gratitude and indebtedness with the factor analysis loadings, and beyond issues of power and sample size, I suggest that future studies may want to attempt to measure cognitive and affective responses differently as a result of what has been learned from running the present studies. As Breckler (1984) suggests, multiple measurements of affect, cognition, and behavior should be used to test a more complete model – including verbal and nonverbal measures. For this study, with the exception of behavior, most of the responses I collected were verbal. For example, I could use heart rate (i.e., nonverbal response) as a measure of the affective component. In short, using multiple methods of measuring the three components could lead to improvement of my overall model and ancillary analyses.

I examined how both affect and cognition and gratitude and indebtedness predict ticket distribution (i.e., behavior). First, I found that the number of tickets distributed did not vary significantly across conditions. However, in examining the means, the trend was that the Gratitude condition seemed to distribute more tickets than the Control. The participants in the Indebtedness condition also seemed to distribute more compared to people in the Control, but fewer than the people in the Gratitude condition. In examining this trend, while not significant, my hypothesis that people in the gratitude condition would distribute more seems plausible. With a bit more power, I predict this trend would be significant in the described fashion.

Finally, the underlying theory of this dissertation is that attitudes about social exchange situations can be described using a three component theory of attitude (i.e., tripartite model of attitude). First, I examined whether overall attitude toward the benefit
and benefactor varied across conditions. I found that the Gratitude and Indebtedness conditions reported a significantly more positive attitude toward the benefactor than the Control condition. This makes sense – in both the gratitude and indebtedness condition there was interaction between the participant and the “benefactor”, thus allowing for the formation of a more positive attitude. In both conditions the benefactor was giving more tickets than one would anticipate, whereas in the Control condition the benefactor was not responsible for ticket distribution. The overall evaluation of the benefit (i.e., tickets) was marginally significant. In examining the trend, the individuals in the Control condition had a more negative attitude toward the tickets than those in the Indebtedness condition. For the people in the Control condition, the tickets may have not held as much importance because they were simply things gained through random distribution. What this finding also illustrates is that the formation of the overall attitude toward a benefactor in a social exchange is different from the formation of the overall attitude toward the benefit – in studying social exchange, researchers will want to be sure to delineate the attitude toward the object of exchange and the person involved in the exchange.

I examined gratitude and indebtedness as predictors of overall attitude toward benefactor and benefit across conditions. In general, gratitude and indebtedness are not significant predictors of overall attitude toward benefactor and benefit. The general trend, however, was that gratitude was better at predicting attitude toward the benefactor, while indebtedness was better at predicting attitude toward the benefit. This trend offers an interesting insight as to the circumstances that one will respond with gratitude or indebtedness. Gratitude is, perhaps, the more “social” of the two responses in that it is
directed at a social object (e.g., benefactor). In contrast, indebtedness may be directed at objects in general (e.g., benefit), and the process of acknowledging the benefit itself may be, in part, what indebtedness comprises. This interpretation of what gratitude and indebtedness are in social exchange situations should be considered in research design when exploring indebtedness in social context.

My final analysis was a test of the three component theory – does affect, cognition, and behavior predict overall attitude toward the benefactor and benefit? In regards to the benefactor, yes – positive affect, negative thoughts, normative thoughts (marginal), and behavior are all significant predictors of attitude toward a benefactor. The three factor model, which is tested in Step 3, accounts for the most variance when explaining the attitude toward the benefactor. In general, Study 2 provides preliminary support for the tripartite model when applied across social exchange situations. For benefits, however, the affective-cognitive model is preferred; when including the behavioral measure, the model for predicting attitude toward the benefit does not account for a significant amount of variance compared to the two component model.
Chapter 8

General Discussion

Limitations

The present two studies were designed to test hypotheses about gratitude and indebtedness in social exchange. As addressed in Chapter 2 and at my dissertation proposal, internal validity advantages of separating the repeated measures chronologically, and collecting the first measurement online were weighed against practical concern of whether the participants would comply and make a second appointment to come in person to complete the study. The present results indicate the practical concern came to fruition, with only one third of participants that completed the first part of the study came in person to complete the second part of the study.

Creating Indebtedness in the Lab

These studies provided preliminary support for differences between gratitude and indebtedness in social exchange. Both studies showed that a distribution game involving the exchange of tickets for a raffle could successful induce gratitude as opposed to indebtedness compared to baseline, successfully replicated previous findings (Tsang, 2007). This validates this methodological technique as a viable way to induce gratitude. However, in Study 2, the attempt to extend this research by the addition of an indebtedness condition was met with limited success – the indebtedness condition reported more
obligation toward the partner, but not significantly so. In addition to increased sample size, I think that a stronger induction might be necessary to differentiate a benefit in kind versus a benefit given with obligation. For the indebtedness condition, I used a note from the partner that said “I will give you extra tickets now if you can help me later.” This is phrased using deontic reasoning (Fiddick, 2006) – expressing one’s duty or obligation to the partner – but perhaps there also needs to be a more apparent obligation expressed by the partner (i.e., author of the note). Instead, the note should perhaps reflect necessity in helping in the future (e.g., “I am giving you extra tickets now but you must help me in the future.”) When the participant reads the note, the tickets have already been distributed and without the explicit instruction of what one must do, participants might interpret the note as a kind suggestion rather than an obligation. So another interesting twist on the methods could be to ask for help in the future, and if the participant agrees to help, they receive the extra tickets. In other words, I think the language has to be explicitly preconditioned and communicate that reciprocity is expected or the sequence of events (i.e., participant agrees to help, then receives tickets) may need to be adjusted.

Future Experimental Methods

A second issue relevant to this research, and should be considered for future replication, is the use of different methods and analyses. The research strategy I used for these two studies was largely correlational in nature; I used multiple regression analyses to find within each condition whether affect, cognition, and/or behavior was associated with attitude – a technique advocated by Zanna & Rempel (1988) for exploring attitude. In future studies, I may want to use alternative strategies. For example, I may want to use
structural equation modeling (SEM). SEM or path analysis would account for the inter-correlation of some of these measures, I would perhaps show causal links between affect and gratitude, for example. As I refine the methodological techniques for this line of research, the analyses should vary as well. Multiple methods and strategies of testing my basic theory will enhance the validity and strength of my research program.

Factor Analysis

Another issue is the results of the two factor analyses. In Study 2 I did not obtain the exact same factors that I found in Study 1. I suggest part of this is due to the use of more than one condition in Study 2. Ideally, a factor analysis should be conducted on each individual condition, and with sufficient power, this may be a worth-while exercise. Also, I chose to use the factors found in Study 2 to conduct the analyses, rather than using the same factors found in Study 1. I decided to use a data-driven approach as opposed to theory-driven approach. Because most of this work is exploratory, I wanted to consider the data as it presented itself. As I continue this research program, I will need to use confirmatory factor analyses as opposed to exploratory factor analyses (Breckler, 1984) if I wish to continue replication of the tripartite model of attitude as applied to social exchange.

Summary

Despite the some of the issues in Study 2, it is clear that the Gratitude and Indebtedness manipulations affected responses and behavior differently. In Study 2, when examining the effect of the three different conditions, normative thought was elicited more in the Gratitude condition as compared to the Control condition. The Gratitude and
Indebtedness conditions also had more positive overall evaluations of the partner and the tickets compared to the Control condition. The Gratitude and Indebtedness conditions also gave more tickets to their partner, although this was a trend and not a significant effect. Looking within each condition and its prediction of ticket distribution, I found that in the Indebtedness condition, self-reported indebtedness was a positive predictor of tickets. That is the more indebted a person feels to a benefactor when given a benefit with obligation, the more one reciprocates (i.e., gives more tickets). This association was not present for the Gratitude or condition, which suggests these two conditions were different.

I also looked at whether affect and cognition were predictive of the number of tickets distributed. In Study 1 – which was the Gratitude condition of Study 2 – positive affect and prosocial thoughts were significant predictors of tickets distributed. However, in Study 2, positive affect was inversely related to tickets distributed in the Gratitude condition. Thus, the findings did not replicate. The factor loadings, again, were different in Study 2. Even so, the Study 2 result was in the opposite direction of my hypothesis and the overall findings in the study. As illustrated in Table 12, there was no significant difference between the three conditions in regards to positive affect and negative affect. However, examining the trend of negative affect, it seems as though the Gratitude condition reported higher negative affect than the other two conditions.

In Study 1, gratitude and positive affect were associated, whereas the trend was that the cognitive measures were associated with indebtedness. In Study 1, I found that positive thought was not related to gratitude. In the general findings of Study 2, however, I found that positive affect and positive thought loaded onto a similar factor. Thus, in Study 2, the
combination of positive affect and thought (as one variable) was predictive of gratitude. For Study 2, none of the affective or cognitive factors significantly predicted indebtedness, however the trend was that the cognitive factors (namely negative and normative thought) were associated.

To test the three component theory of attitude as applied to social exchange, I regressed overall attitude toward the benefactor and benefit on affective, cognitive, and behavior measures in three steps. In Step 1, I entered affect (positive affect). In Step 2, I entered cognition (normative, negative, and prosocial thought), and in Step 3, I entered behavior (tickets distributed). The three component model of attitude toward the benefactor was supported, and offered a better explanation for the data in Study 2 than a model using gratitude and indebtedness. I think one of the reasons why the tripartite model explains the data best is because the measurement used applied directly to the task at hand – the components were specific to the benefactor and the benefit in the distribution game. In contrast, the measures of gratitude and indebtedness are indirect evaluations of the distribution game. Part of my objective was to see if the indirect measures (gratitude and indebtedness) could serve as proxies for the direct measures (affect, cognition, and behavior) and vice versa. Exploratory results presented in these two preliminary studies are indicative that the more direct measures are simply better at predicting attitude.

To summarize, gratitude and indebtedness, as measured by the state scales used in these two studies, were not significant predictors of attitude. However, affect, cognition, and behavior were. Specifically, the three component model was a good fit for predicting attitude toward the partner. In examining the individual conditions, negative thought was
negatively associated with attitude toward the partner in the Gratitude condition. Thus the fewer negative thoughts, the more positive the overall evaluation of the partner. There was also a trend for positive affect and its positive association with benefactor attitude. In Study 1, positive affect and thought were associated with a positive evaluation of the benefactor. The findings between Study 1 and Study 2 do not directly replicate, in part, as a result of the different factor loadings. In general, however, the gist of the data suggest positive affect is associated with a positive attitude toward one’s partner, whereas negative thoughts are inversely associated with a positive attitude toward one’s partner.

Future Directions

The indebtedness manipulation appears to have been too subtle to test the present hypotheses. One way these studies can be improved is by strengthening the manipulation used the Indebtedness condition. Obligation may be induced by giving the participant a conditional in the Indebtedness condition: if you agree to help out your partner two extra tickets in the future, she agrees to give you extra tickets now. The participant then has the choice to decide to accept the tickets (i.e., agree to help later) or not. It would be interesting to see if the use of a concrete conditional (e.g., two extra tickets) induces indebtedness and obligation more strongly and if it reduced gratitude.

The Gratitude and Indebtedness conditions – the two conditions that involve explicit give and take with a partner – may be fundamentally different from the Control condition in that they involve direct “give and take” with a partner. The Control condition was more or less a condition of luck – their partner has nothing to do with the distribution of tickets. As reflected by the exploratory data presented, participants evaluate the
benefactor and the benefit less positively than the Gratitude and Control conditions. This can be useful in showing how helping behavior is motivated or driven when the recipient of help has never done anything for the participant. The Control condition would provide a good test of the tripartite model as applied to receiving a benefit by chance – how do people respond to a “lucky” situation, and then what happens when they “share” their luck. How do people “pay it forward” to an unknown individual?

This type of question bridges questions of what motivates and hinders people from making investments into risky investment propositions. One method would be to use a two by two between subjects design: explicit instructions or no instructions about who distributes during the rounds and all rounds are due to chance or rounds are not due to chance (i.e., partner will choose how many tickets to distribute). Does the randomness by no instructions condition result in a more negative evaluation of the benefit when giving away some of the tickets in subsequent rounds? I would predict that this group would replicate the responses given in Study 2’s Control condition. This would lend more insight into how people react to giving away things they have received simply due to chance. It would also be interesting to see if some of these effects are explained, in part, by one’s political attitudes about helping others that we do not know (i.e., taxes used for government programs).

Another aspect of this study that I’ve pondered is whether the participants knew or thought that the experimenter (in addition to the partner in the Gratitude and Indebtedness conditions) was knowledgeable of how many tickets they were distributing. In other words, did they think that their actions were public or private? Previous research has
shown that public self-awareness can affect how people recall their actions in a social exchange such that high self-awareness leads to a recalling their actions with more indebtedness (Mathews & Green, in press). When people are aware of themselves as social objects, they recall social exchanges differently – one could infer that they could act differently as well. This connection to self-awareness and impression management issues raises intriguing possibilities for future research. If participants were self-aware (e.g., using a mirror to induce a high self-awareness condition) during the distribution game, would that affect the three overall components, as well as gratitude and indebtedness? Would those in the self-awareness condition distribute more tickets in Gratitude and Indebtedness conditions than the non self-aware? This particular line of research would be an especially fruitful direction for me, as it would connect my thesis work to my dissertation work and would serve as a cornerstone to my research program.

As illustrated, the data suggest that predicting attitude toward the benefit is different from predicting attitude toward the benefactor. As mentioned in the Discussion section of Study 2, one possible explanation of why these models are different is the strength or the accessibility of the attitude formed. Why might the three components predict attitude toward benefactor but only affective and cognitive predict attitude toward the benefit? One explanation is that people have more accessible attitudes toward benefactors because social exchange is something that the participants have more direct experience with (Fazio, 1989). Thus, they may have richer, or simply more salient, affective, cognitive, and behavioral responses to a benefactor as opposed to raffle tickets.
Relatedly, approach and avoidance motivation may play a role in attitude accessibility. In one of the original tests of the tripartite model utilized a snake – not a particularly good social object. However, this study affirmed the tripartite model of attitude (Breckler, 1984). I found that affect, cognition, and behavior predict attitude toward the benefactor. Benefactors (people in general) are encountered on a daily basis, and forming attitudes that are accessible about people is very important. So important, that if a particular encounter with another person is especially good or bad, we may be motivated in the future to approach or avoid this person respectively. Objects in our world that elicit strong approach or avoidance may incur more accessible attitudes, and thus the three components of attitude are associated with these attitudes. For example, if I have experience with someone who has cheated me out of money as opposed to someone who has given me money, I would predict different affect, cognition, and behavior toward these two individuals; models testing this type of question could offer insight into what drive approach versus avoidance behavior. The role of approach – avoidance motivation on attitude formation should be explored both in regards to social exchange and more broadly across social psychological phenomena.

In conclusion, I have presented two preliminary studies that suggest gratitude is related to positive affect, and positive affect is a strong predictor of reciprocity behavior after a distribution game. A trend showed that gratitude is related to the attitude toward the benefactor. Indebtedness does not share this relationship with positive affect nor does it show a relationship trend with benefactor attitude, suggesting it is a different experience from gratitude. Affect, cognition, and behavior predict the evaluation of benefactors in
different social exchanges, whereas affect and cognition alone predict the evaluation of the benefit itself. Thus, different components of attitude – affect, cognition and behavior – are associated with different components of social exchange: the person and the object.
References
References


Appendices

Appendix A – Gratitude, Resentment & Appreciation Test

Please respond to the following statements by choosing the number that best represents your feelings. Please use the scale provided below, and please choose one number for each statement, and record your choice in the blank preceding each statement.

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<tbody>
<tr>
<td>1</td>
<td>I strongly disagree</td>
<td>2</td>
<td>I disagree somewhat</td>
<td>3</td>
<td>I feel neutral about the statement</td>
<td>4</td>
<td>I mostly agree with the statement</td>
<td>5</td>
<td>I strongly agree with the statement</td>
</tr>
</tbody>
</table>

_____ 1. I think I couldn't have gotten where I am today without the help of many people.

_____ 2. I feel that life is good to me.

_____ 3. My current feeling is that there isn't enough to go around and I don't get my share.

_____ 4. As I reflect, I am overwhelmed at the beauty of nature.

_____ 5. Although I feel good about my accomplishments, I find myself reflecting on how others have contributed to my accomplishments.

_____ 6. At the moment, I really don't think that I've gotten all the good things that I deserve in life.

_____ 7. I really enjoy watching the leaves change colors.

_____ 8. Although right now I feel in control of my life, I can't help but think about all those who have supported me and helped me along the way.

_____ 9. My current feeling is that I think it's important to "Stop and smell the roses."

_____ 10. It seems that more bad things have happened to me in my life than I deserve.
11. Because of what I've gone through in my life, I now feel like the world owes me something.

12. I think that it's important to pause and "count my blessings."

13. My current feeling is that it's important to enjoy the simple things in life.

14. I feel deeply appreciative for the things others have done for me in my life.

15. At the moment, I don’t have the advantages that others get.

16. I think it's important to appreciate each day that you are alive.
Appendix B – Gratitude Questionnaire

Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it.

1 = strongly disagree
2 = disagree
3 = slightly disagree
4 = neutral
5 = slightly agree
6 = agree
7 = strongly agree

___ 1. I have so much in my life to be thankful for.

___ 2. If I had to list everything that I felt grateful for, it would be a very long list.

___ 3. As I look at the world, I don’t see much to be grateful for.

___ 4. I am grateful for a wide variety of people.

___ 5. As I get older I find myself more able to appreciate the people, events, and situations that have been part of my life history.

___ 6. Long amounts of time can go by before I feel grateful to something or someone.
Appendix C – Indebtedness Scale

Please indicate your response to the following items by circling the number that best represents your agreement or disagreement. There are no right or wrong answers to these items, so please provide as honest assessment of your agreement as you can.

If a friend did me a favor, I would make sure to repay them as quickly as possible.  
Owing someone a favor makes me uncomfortable.  
I would not borrow money from a friend unless it was absolutely necessary.  
Asking for another’s help gives them power over your life.  
Never a borrower or a lender be.  
I’d be embarrassed if someone had to remind me of a debt I owed them.  
As a rule, I don’t accept a favor if I can’t return the favor.  
If someone paid for my dinner or invited me to eat at their place, I would feel obligated to buy them dinner the next time or to invite them to eat at my place.  
I would be very upset if I discovered that I had forgotten to return something I borrowed.  
If someone goes out of their way to help me, I feel as though I should do more for them than merely return the favor.  
When someone does me a favor it often bothers me because I immediately wonder how I will repay them.  
I like to make sure I don’t owe anybody anything.  
I find myself worrying about whether I have repaid all the favors I have received.  
When someone gives me something or provides a favor to me, I usually feel somewhat uncomfortable at first.  
I’d rather do things myself than have someone help me because I wouldn’t like feeling obligated to return their favor.  
I don’t receive gifts very well.  
If someone bought me an expensive gift, I would worry a lot about whether I would be able to repay them.

Strongly Disagree

Strongly Agree
In good friendships you should make sure that you pay back all the favors you have received from your friend.

If someone does me a favor, I usually try to pay them back as soon as possible.

I would be uncomfortable right now if someone surprised me with a large or expensive gift.

Being able to repay a favor or gift brings me great relief.

I have trouble enjoying gifts from others because I am concerned about what I would give them in return.
Appendix D – Semantic Differential (Benefit)

Please indicate your opinion about the tickets you just received. These tickets were:

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<tr>
<th></th>
<th>Very</th>
<th>Somewhat</th>
<th>Somewhat</th>
<th>Very</th>
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<tr>
<td><strong>Good</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td><strong>Helpful</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td><strong>Pleasant</strong></td>
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<td><strong>Useful</strong></td>
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<tr>
<td><strong>Meaningful</strong></td>
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(Benefactor)

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<tr>
<th></th>
<th>Very</th>
<th>Somewhat</th>
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<td>1</td>
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<tr>
<td><strong>Helpful</strong></td>
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<td>4</td>
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<tr>
<td><strong>Nice</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td><strong>Fair</strong></td>
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<tr>
<td><strong>Kind</strong></td>
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<tr>
<td><strong>Brave</strong></td>
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Appendix E – Positive Affect & Negative Affect Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate number next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale provided to record your answers.

1 = very slightly or not at all  
2 = a little  
3 = moderately  
4 = quite a bit  
5 = extremely

<table>
<thead>
<tr>
<th>Item</th>
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<tr>
<td>Disinterested</td>
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<tr>
<td>Excited</td>
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<tr>
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<td>Strong</td>
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<td>Guilty</td>
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<tr>
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<tr>
<td>Active</td>
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<tr>
<td>Afraid</td>
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Appendix F – Thought Listing (Benefit)

Below, please write about the raffle tickets you received. What do you think about receiving these raffle tickets?

(Benefactor)

Below, please write about your partner. What thoughts do you have about your partner?
Appendix G - Demographics

1) Your gender (please check one): _____ Male _____ Female

2) Your age (please fill in): __________

3) Your race (please check one):
   _____ African American   _____ Latina/o
   _____ Asian American    _____ Other (specify):
   _____ Caucasian
   _____ Native American

4) Your year in school (please check one):
   _____ Freshman _____ Junior
   _____ Sophomore _____ Senior
   _____ Other
Appendix H - Debriefing Sheet

Before you leave, we’d like to ask you a few questions about your experience with this study.

1. What do you think the purpose of this study was?

2. Had you heard about the nature of this study before you came today to participate?

3. Using the scale below, how suspicious were you of the procedures used in this study?

  1  2  3  4  5  6  7
   Not at all suspicious    Very suspicious

Dear Participant,

You just took part in a study that is investigating how people respond to a benefit. We are investigating whether people’s thought or feelings in a social exchange predict how grateful or indebted one feels about the exchange. Because we needed to simulate an actual exchange, we told you that you were working with a partner. However, there was no partner and all of the tickets you received were predetermined. We hope you have found this study to be interesting – rest assured that your participation and answers you used today will be held in privacy. We request that you not discuss what went on in this study with other Psyc 101 students – we want all potential participants to have the same experience you did. In addition to the .75 credit from today, we will be using your raffle tickets – we are raffling off a $25 gift certificate from amazon.com! Your raffle tickets will serve as an entry into the raffle! If you should be the winner, we will contact you at the email provided on your tickets and the sign in sheet.

THANK YOU FOR YOUR TIME AND COOPERATION! HAVE A GOOD SEMESTER!
Vita

Maureen Anne Mathews was born on April 29, 1975 in Auburn, New York, USA. In 2002, she earned her Associate of Arts at Spokane Community College in Spokane, Washington; she earned her Bachelor of Arts (cum laude) at Eastern Washington University, Cheney, Washington, in 2004, where she was inducted into the Psi Chi and Phi Kappa Phi honor societies. After completing her Bachelor’s, she completed a Master of Science degree at Virginia Commonwealth University in Richmond, Virginia in 2007. At VCU, Maureen was the first student coordinator of the colloquia series “Social Psychology Under Discussion” during the 2006 – 2007 academic term, and was recognized as the Outstanding Social Psychology Student and Outstanding Student Teacher in 2009. From 2007 through 2009, she served as a graduate mentor to two undergraduate psychology majors through the selective Graduate School Mentorship Program. She has published in *Cognition & Emotion*, as well as co-authored a chapter for Nova Science Press. Upon completion of this dissertation, she has accepted a Visiting Assistant Professor of Psychology appointment at St. Mary’s College of Maryland in St. Mary’s City, Maryland.