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GRATITUDE, INDEBTEDNESS AND RECIPROCITY

TO THANK OR NOT TO THANK: UNDERSTANDING THE DIFFERENCES BETWEEN
GRATITUDE AND INDEBTEDNESS AFTER RECEIVING A FAVOR THROUGH
EMOTION APPRAISALS, MOTIVATIONS AND BEHAVIORS

NAI ZE LING

SINGAPORE MANAGEMENT UNIVERSITY
2019

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

To Thank or Not to Thank: Understanding the Differences Between Gratitude and
Indebtedness after Receiving a Favor Through Emotion Appraisals, Motivations and
Behaviors

by

Nai Ze Ling

Submitted to School of Social Sciences in partial fulfilment of the requirements for the
Degree of Doctor of Philosophy in Psychology

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2019

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

I hereby declare that this PhD dissertation is my original work
and it has been written by me in its entirety.
I have duly acknowledged all the sources of information
which have been used in this dissertation.

This PhD dissertation has also not been submitted for any degree
in any university previously.



A handwritten signature in black ink, reading "Ze Ling", is written over a horizontal line. The signature is cursive and stylized.

Nai Ze Ling
7th June 2018

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

To Thank or Not to Thank: Understanding the Differences Between Gratitude
and Indebtedness after Receiving a Favor Through Emotion Appraisals,
Motivations and Behaviors

Nai Ze Ling

ABSTRACT

Objective: This study aimed to distinguish between daily experiences of gratitude and indebtedness through three stages - emotional appraisals, motivations to reciprocate and behavioral tendencies. Through these three stages, I aimed to gain a better insight of the emotional process involved before and after receiving favors. **Method:** 196 participants were recruited from Singapore Management University to take part in a 14-day diary study. Every two days, participants were asked to report a favor they received over the past two days and evaluate the favor based on their appraisals of the experience. They were also asked to report their motivation to reciprocate each favor received. Upon completing the diary study, participants attended a follow-up session where were asked to report their behavioral tendencies over the past week. **Results:** Gratitude and indebtedness were associated to varying extends with different benefit appraisals. For instance, gratitude was positively associated with perceived benevolence and indebtedness with perceived expectations of repayment. Gratitude was also found to motivated reciprocity via the desire to affiliate, while indebtedness motivated reciprocity through the desire to adhere to the norm of reciprocity. Finally, gratitude was associated with increased reports of affiliative behaviors while indebtedness was associated with the likelihood of repaying the favor. The theoretical implications, practical implications, and future directions of these findings were discussed.

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CHAPTER 1: INTRODUCTION

Gratitude and indebtedness seem to be very similar emotions. They are emotions that can be experienced when people receive help from others, and have also been found to motivate reciprocity (Bartlett & DeSteno, 2006; Greenberg, 1980; Peng, Nelissen, & Zeelenberg, 2017). Some researchers consider them to be the same emotion or at least make no distinction between them (Greenberg, 1980; Tesser, Gatewood, & Driver, 1968). However, more recent studies question this assumption. These studies have found that when certain factors are more salient (Brock, Folsom, & Black, 2016; Tsang, 2006, 2007; Watkins, Scheer, Ovnicek, & Kolts, 2006) people are more likely to experience either gratitude or indebtedness. Peng et al., (2017) has also suggested that both emotions play different roles in social exchange, and lead to very different outcomes. If both gratitude and indebtedness can be elicited in response to the same situation (benefitting from another person's actions), and have different functions in social exchange, there are three key questions I would like to explore in this dissertation. First, which antecedents or aspects of the situation distinguish the two emotions? There is evidence to suggest that people experience gratitude and indebtedness depending on how they appraise the situation. For instance, receivers are more likely to experience gratitude when they believe the benefactor performed the favor with benevolent intentions (Wood, Maltby, Steward, Linley, & Joseph, 2008b). On the other hand, receivers are more likely to experience indebtedness when they believe the benefactor performed the act expecting repayment (Watkins et al., 2006). Second, gratitude and indebtedness are hypothesized to have different functions and reflect different motives such as relationship building (gratitude) or restoration of equity (indebtedness). Hence, another aim is to evaluate the motives associated with gratitude and indebtedness. Third, if gratitude and indebtedness

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correspond to different motives, it is likely that these motives would drive different behaviors as well. For instance, a desire to affiliate with another person should drive behaviors such as spending more time with the benefactor. Hence, the third aim to the study is to examine the behavioral consequences of both gratitude and indebtedness in everyday life.

Definitions of Gratitude and Indebtedness

Key Features of Gratitude

Gratitude is a positive experience where people feel thankful and appreciative towards their benefactor (McCullough, Tsang, & Emmons, 2004). In addition to being a positive emotion, gratitude may confer other positive benefits such as relationship building (Algoe, 2012; Algoe, Haidt, & Gable, 2008). Gratitude may play an important role in helping us identify individuals that we can develop relationships with, and also aids in relationship maintenance with existing relational partners (Algoe, Gable, & Maisel, 2010). One of the main reasons gratitude contributes to relationship building and maintenance could be because gratitude fosters a positive view of others. When we experience gratitude, we tend to perceive our benefactors in a more positive light. We believe that our benefactors are more responsive to our needs (Algoe et al., 2008) and more supportive towards us (Algoe & Stanton, 2012; Kong, Ding, & Zhao, 2014; Wood, Maltby, Gillett, Linley, & Joseph, 2008a). Studies have also found that people express stronger desires to affiliate with their benefactors (Bartlett, Condon, Cruz, Baumann, & DeSteno, 2012; Williams & Bartlett, 2014), and are more likely to perform prosocial acts for their benefactors (Bartlett & DeSteno, 2006). These studies suggest that when we experience gratitude, we (a) see our benefactors in a more positive light and (b) show increase concern towards their welfare. However, other studies show that gratitude leads to pay-it-forward effects or upstream reciprocity, which was found to increase cooperation within groups (Chang, Lin, & Chen, 2012). Gratitude may also increase people's trust in others (Dunn & Schweitzer, 2005), which could increase the individual's desire to

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affiliate with people more generally. Often, the benefactor is the natural target of this affiliation, but it seems that this desire to affiliate can extend to people other than the benefactor. For example, Bartlett et al. (2012) found that after experiencing gratitude, people were more likely to provide help and assistance toward both their benefactor and strangers. Thus, although gratitude seems to increase the desire to affiliate with benefactors, it appears that this effect may carry-over to other social targets.

Key Features of Indebtedness

Indebtedness is often experienced as a negative, uncomfortable feeling that is accompanied by an obligation to repay the benefactor (Greenberg, 1980). The discomfort that accompanies indebtedness is said to be derived from socialization experiences with the norm of reciprocity--a social norm in which people return favors and other acts of kindness (Gouldner, 1960). Contrary to experiencing gratitude, which seems to encourage prosocial and relationship building, people who experience indebtedness are more likely to form negative evaluations of their benefactor (Brock et al., 2016). They also display a reduced desire to affiliate with their benefactors (Brock et al., 2016). However, by focusing on the debt and what is owed, feelings of indebtedness may act as a preventive measure to avoid social disapproval (Mathews & Shook, 2013) by increasing an individual's commitment to pay back the help received. Thus, the role of indebtedness in social exchange may be to motivate individuals to adhere to the social norm of reciprocity (Greenberg, 1980).

Benefit Appraisals

People's emotions arise from the perceptions of their circumstances (Ellsworth & Scherer, 2003). Appraisal theory suggests that emotions consist of patterns and interpretations of perceptions. Peoples' evaluation of the event plays a critical role in their emotional experience. Therefore, depending on how people evaluate the situation, they are more likely to experience one emotion over the other. It is plausible that certain perceptions

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are more strongly associated with specific emotions. For instance, when people see a threat to their lives, they experience fear. Therefore, it is also possible to suggest a causal relation from appraisals to emotions.

According to Tesser et al. (1968), people appraise the help received through three benefit appraisals – perceived value of help to receiver (V), perceived intention of benefactor (I) and the perceived cost incurred by the benefactor (C). In their study, participants read different vignettes that manipulated the three components of benefit appraisals. All three appraisals were independently predictive of gratitude. However, later research has found that benefit appraisals predict gratitude and indebtedness to varying degrees (Peng et al., 2017; Watkins et al., 2006).

Perceived value of help to the receiver refers to how instrumentally beneficial the help was to the receiver. The greater the perceived value, the greater the value of help to the receiver. Gratitude has been suggested as a moral barometer that signals to the receiver the value of the help he (she) has received (McCullough, Kilpatrick, Emmons, & Larson, 2001). Several studies suggest that the larger the perceived value by the receiver, the more gratitude he (she) experiences (Ortony, Clore, & Collins, 1988; Peng et al., 2017; Tsang, 2007). Converse and Fishbach (2012) manipulated how beneficial help was by requesting participants to rate their gratitude either while they were waiting for the help, or after they had already received the help and completed the task. Their results suggested that when participants were waiting for the help, they were more grateful towards their benefactors who were helping them complete the task than when they rated their gratitude *after* they had completed the task. Based on these results, Converse and Fishbach (2012) proposed that when the receiver urgently needs the help, he (she) is likely to experience more appreciation towards the benefactor than under less urgent circumstances, even if the outcome of the help is uncertain. This finding suggests that it need not be the actual value of the help provided,

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but rather the potential value of the benefit that affects the intensity of gratitude. This makes it possible to feel grateful for help that *could have* yielded desirable outcomes, even if ultimately unsuccessful (Ortony et al., 1988).

Research has also suggested that the larger the value of the benefit received, the more indebted the receiver would feel (Greenberg, 1980; Greenberg & Frisch, 1972). In their study, Greenberg and Frisch (1972) manipulated the amount of help their participants received. Their results suggested that the greater the amount of help people received, the more indebted they felt. This could be because the receiver is more likely to recognize and acknowledge that the benefactor did help him (her), and feel that something is now owed to the benefactor.

Given that perceived value is positively related to both gratitude and indebtedness, it may not differentiate the two emotions. However, research suggests that indebtedness and gratitude may differ in how much they are affected by perceived cost (C) to the benefactor and perceived intention (I) of the benefactor. My dissertation will focus on these two appraisals as potential differentiators of gratitude and indebtedness in daily life.

Perceived Intention of Benefactor

The extent to which gratitude and indebtedness are experienced may depend on the perceived intention of the benefactor. It seems that gratitude is more likely to be elicited if the benefactor is perceived as benevolent—that is, providing help out of goodwill (Bock et al., 2016; Tsang, 2006, 2007). In a study by Tsang (2006), participants were presented with a scenario in which the benefactor either helped out of good will, or helped with expected repayment. Participants who believed that their benefactor helped out of goodwill were more grateful than participants who believed that their benefactor helped and expected repayment. These results were replicated in Study 2, in which participants who recalled benevolent favors performed by their friends experienced more gratitude than participants who recalled favors for which their friends expected repayment. Similar results were found by Bock et al.

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(2016), who asked participants to recall an incident in which they felt grateful or indebted towards a sales staff. Participants who recalled a grateful experience felt that the sales staff were looking out for their best interest, and were helping them with benevolent intentions.

Benevolent intentions may be associated with gratitude by strengthening the belief that one's partner is responsive (Reis, Clark, & Holmes, 2004). Responsiveness towards partners involves being attentive towards the partner's feelings, desires and needs, and acting in response to it (Canevallo & Crocker, 2010). Benevolent intentions are associated with responsiveness as the intention to help someone often stems from the care for that person. Care towards one's partner may increase the benefactor's attentiveness towards his (her) partner's needs and in turn, respond accordingly. While perceived benevolent intentions may lead to an increase in perceived responsiveness towards one's needs, both constructs are distinct. Benevolence towards the partner might lead to an increase in responsiveness towards the partner's needs, but responding to the partner's needs does not always stem from benevolent intentions. For instance, the benefactor can be very responsive when providing a favor out of a sense of duty or obligation. However, in the context of daily experiences, I believe that most help offered to relational partners (e.g. friends, family) stems from goodwill and a sincere intention to help the partners in need. Therefore, it is likely that when receivers perceive their benefactors to be benevolent, it is likely to be derived from the receiver's belief that the benefactor truly cares for him (her) and is responsive towards his (her) needs. This in turn, may increase the receiver's gratitude.

H1a: Perceived benevolence is positively associated with gratitude.

H1b: The effect of perceived benevolence on gratitude is mediated by perceived responsiveness.

Unlike gratitude, indebtedness seems more likely to be elicited when the receiver primarily perceives that the benefactor expects repayment for helping (Ames, Flynn, &

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Weber, 2004; Pelsler, Ruytera, Wetzelsa, Grewalb, & Cox, 2015; Watkins et al., 2006). The more salient the expectation for repayment is, the more indebted the receiver is likely to feel. For example, participants were asked to read vignettes that manipulated the level of expected repayment from their benefactors (Watkins et al., 2006). The three conditions were no expectation of repayment, medium expectation of repayment, and high expectation of repayment. After reading the vignette, participants reported their level of gratitude and indebtedness toward the benefactor. Results showed that as the level of expected repayment from the benefactor increased, the amount of indebtedness (gratitude) experienced by the receiver increased (decreased). Similar results were also found by Bock et al. (2016). Participants who recalled an incident in which they felt indebted to a salesperson felt that the latter helped them expecting repayment. Expected repayment may increase feelings of indebtedness as it emphasizes the norm of reciprocity and the obligation to repay. When individuals experience indebtedness, their attention tends to focus more on how to repay their benefactors or the potential liabilities if they do not repay (Mathews & Shook, 2013). This attention on repayment may increase their feelings of indebtedness towards their benefactors.

H2: Perceived expectation of repayment should be positively associated with indebtedness.

Perceived Cost to Benefactor

Perceived cost to the benefactor refers to the amount of time, money, or effort incurred by the benefactor to provide help. A greater perceived cost may suggest that the benefactor had invested more resources when providing help. Past research does suggest that the higher the perceived cost incurred by the benefactor, the more grateful the recipient feels for the favor (Algoe et al., 2008). Algoe et al. (2008) recruited pairs of sorority sisters as participants at the start of the school year, during an event known as sister week. For the entire week, sorority seniors would prepare gifts for the freshmen due to enter the sorority.

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Results showed that the freshmen who received gifts that were seen as requiring a lot of time, money or effort felt more grateful. It was suggested that the cost invested was seen as an indicator of responsiveness, whereby the benefactor invested time and effort to understand the recipients' needs and provided the help in a way that accounted for such needs. Hence, perceived responsiveness may signal how much a benefactor is potentially willing to invest if a relationship is formed.

Past research suggests that perceived cost acts as an indicator of perceived responsiveness (Algoe et al., 2008). However, it could also be that perceived responsiveness influences perceived cost. Both pathways seem plausible as people can make a direct evaluation of time, effort and money spent on a favor and from there, infer how responsive the benefactor is. However, people can also focus on how much the favor fulfills their needs (perceived responsiveness first) and from there, infer how much time and effort a person has invested to be so helpful. It is important to acknowledge the plausibility of both models. However in this dissertation, I hypothesize perceived responsiveness as mediator between perceived cost and gratitude as there is past evidence supporting these relations (Algoe et al., 2008).

H3a: Perceived cost to benefactor should be positively associated with gratitude.

H3b: The effect of perceived cost on gratitude is mediated by perceptions of how responsive the helper is.

Perceived cost incurred by the benefactor to perform the help is also likely to be positively predictive of indebtedness. According to Greenberg (1980), indebtedness is influenced by the discrepancy between the benefactor's inputs and outcomes in the helping situation—what he called “net costs”. Similarly, equity theory suggests that equal exchanges in a relationship are sustained when an individual's inputs match their outcomes (Adams, 1965). An instance when inequity might occur is when the benefactor helps the recipient but

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does not gain immediately from helping. The lack of immediate gain results in the benefactor's contributions (input) exceeding the rewards gained (outcomes) from helping the receiver—thus greater net costs to the benefactor are perceived. As a result, when the recipient notes that there is a difference between the benefactor's inputs and outcomes, this difference motivates him (her) to pay more attention to the costs incurred by the benefactor, and increases the recipient's motivation to repay the benefactor. In addition, focusing on the perceived costs enables the recipients to better gauge how much he (she) should repay the benefactor. This could be to maintain their own internal standards and avoid short changing the benefactor (Perugini, Gallucci, Presaghi, & Ercolani, 2003) or to appear fair and responsible in front of others (Cialdini, 2001). Hence, the greater the perceived cost incurred by the benefactor, the more likely recipient would be concerned to repay the benefactor. This in turn, would increase the amount of indebtedness the recipient experiences.

Peng et al. (2017) conducted an experimental study to manipulate the cost incurred by the benefactor to help the receiver. In this study, participants were requested to read a scenario in which their colleague offered to send them home late one night. In the high-cost condition, their colleague had to either take a 40-minute detour; in the low-cost condition, their colleague's home was on the way. Participants felt more indebted in the high-cost than the low-cost condition. Hence, when a higher cost is incurred by the benefactor, the receiver feels more indebted.

Based on the evidence above, both gratitude and indebtedness are associated with perceived costs. However, as hypothesized in H3a, the effect of cost on gratitude is mediated by perceived responsiveness. This suggests that the effects of cost on gratitude seems to tie in with the perceived intention of the benefactor. On the other hand, indebtedness induces a greater focus on debts and what is owed to the helper, which suggests that indebtedness can be influenced by cost alone (Greenberg, 1980). Hence, it is possible to suggest that the direct

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relation between indebtedness and cost would be stronger than the direct relation between gratitude and cost.

H4: Perceived cost should be more strongly associated with Indebtedness than Gratitude.

Motivational Differences between Gratitude and Indebtedness

A number of theorists have proposed affect as an antecedent to motivation and behavior. For example, Weiner's (1985) attribution theory of achievement motivation suggests that our behavior is guided by a combination of cognitive and affective reactions. Cognitive processes are involved in the causal attributions applied to a situation; this can then influence affective experience and subsequent motivation. For instance, a baseball player who lost a game might take different courses of actions depending on how he evaluates the situation. If he attributes the loss to a lack of practice, he might in turn feel guilty about the lack of effort, and this might spur him on to practice more for the game. On the other hand, if he attributes the loss to a lack of talent, he might in turn feel hopeless and in turn, give up playing baseball altogether. Evolutionary psychologists have proposed that each emotion evolved to resolve a specific and recurrent situation (e.g., Tooby & Cosmides, 2008). Emotions are conceptualized as algorithms that coordinate motivation and behavior when relevant situations are detected. For instance, fear evolved to ensure higher survival under threat. When a possible threat is detected, both perceptual and physiological processes are activated that then guide behavior (e.g., fight or flight).

Following previous theories on affect and motivation, gratitude and indebtedness can be seen as emotions that influence our perception of others and how we interact with them. Past studies have shown that when people receive help from others, they are motivated to reciprocate whether they experience gratitude (Bartlett & DeSteno, 2006) or indebtedness (Peng et al., 2017). However, the two emotions may have different functions in social

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exchange (Peng et al., 2017). Evidence in the literature suggests that gratitude may help us identify individuals whom we can develop relationships with (Algoe, 2012; Algoe et al., 2008). On the other hand, indebtedness highlights the favors we owe to others, and serves as a reminder to adhere to the norm of reciprocity (Greenberg, 1980). Thus, although both emotions motivate reciprocity, the underlying reason may be different. I propose that when we experience gratitude, the motivation to repay is driven by a desire to affiliate with the benefactor. On the other hand, when we experience indebtedness, the motivation to repay is driven by the desire to adhere to the norm of reciprocity.

Gratitude and Reciprocity

Experimentally, gratitude has been found to induce reciprocal behaviors such as helping benefactors to complete tasks (Bartlett & DeSteno, 2006), or spreading positive word of mouth about their benefactors (Brock et al., 2016). The effect of gratitude on reciprocity may arise from greater desire or willingness to behave prosocially. Gratitude has been suggested as a means to increase cooperation (DeSteno, Bartlett, Baumann, Williams, & Dickens, 2010) and to build trusting relationships between strangers. Evidence in the literature also suggests that gratitude increases recipients' desire to affiliate with their benefactors. Watkins et al. (2006) manipulated gratitude by having participants read vignettes of receiving help from a friend. The more grateful participants felt towards their friends, they more willing they were to engage in approach behaviors such as initiating contact with their benefactor, and wanting to spend time with them. This increase desire to affiliate could be due to the positive perception people have of their benefactors. When people experience gratitude, they believe that their benefactors are more supportive (Algoe & Stanton, 2012; Kong et al., 2014; Wood et al., 2008a), thoughtful and responsive to their needs (Algoe et al., 2008), as well as friendlier (Williams & Bartlett, 2014). Gratitude is also associated with promotion-focus (Mathews & Shook, 2013), a motivational orientation that drives people

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towards nurturance and reward (Higgins, Shah, & Friedman, 1997). Following this view, gratitude may motivate people to become closer to their benefactor as they may believe that continued interactions will be pleasant, beneficial, and rewarding. In addition, the grateful feeling they experience may broaden their thought-action tendencies (Fredrickson, 2004b) to find potential opportunities to build relationships with their benefactors (Peng et al., 2017). Hence, they might use the opportunity to reciprocate as a reason to further affiliate with their benefactors. Based on existing research, it can be suggested that gratitude increases one's desire to affiliate with their benefactors, and this desire to affiliate drives their motivation to reciprocate.

H5: Gratitude motivates reciprocity through the desire to affiliate.

It is essential to acknowledge that there are other possible alternative models. It is possible to reverse the relation between the desire to affiliate and the motivation to reciprocate. For instance, receivers may desire to affiliate with their benefactors *because* they are motivated to repay the favor. While this relation is plausible, it may also imply that the desire to affiliate does not sustain itself after repaying the favor. However, gratitude has been found repeatedly to build and maintain relationships long after the initial favor (Algoe, 2012; Algoe et al., 2010; Algoe et al., 2008). If gratitude plays such an essential role in relationship building, then it seems more likely to be directly associated with the desire to affiliate and not merely due to the motivation to reciprocate. Furthermore, although gratitude increases the motivation to reciprocate (Bartlett & DeSteno, 2006), this motivation does not seem to be urgent or pressured (Watkins et al., 2006). Hence, I believe it is more plausible that gratitude motivates reciprocity because people view it as an opportunity to affiliate with their benefactor.

Indebtedness and Reciprocity

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As mentioned earlier, the norm of reciprocity is a social rule emphasizing the return of favors and other acts of kindness to those who have helped us (Gouldner, 1960). Keeping to this rule allows for smooth and fair social exchanges. Indebtedness may be tied to the norm of reciprocity for two underlying reasons. Firstly, the norm of reciprocity is a social norm. Thus, if people do not adhere to the norm, there are potential social repercussions that could occur. Those who do not repay the help received may be seen as “free-loaders” or as ungrateful (Cialdini, 2001). Thus, adhering to the norm of reciprocity relieves people of social disapproval. Secondly, as the norm of reciprocity is often internalized by individuals (Burger, Imberi, & Grande, 2009), following the norm allows people to uphold their own internal standards of behavior (Perugini et al., 2003).

Some studies suggest that people are more motivated to repay when they realize that their benefactors have given more than they received (Peng et al., 2017). When this difference is present, people try to make up for this difference by repaying their benefactors. This increase in motivation could be a sign that people desire to follow their internal standards and adhere to the norm of reciprocity, by repaying their benefactors equitably (Perugini et al., 2003). Thus there are both internal and external pressures to adhere to the norm of reciprocity. This pressure to repay can also be seen as a need or an obligation to repay benefactors for the help they have provided, and seems to be closely related with indebtedness. Indebtedness has strong association with feelings of obligations (Watkins et al., 2006), and is often described as an uncomfortable feeling that can be directly relieved by reciprocating the favor (Greenberg, 1980). Hence, it is highly plausible that indebtedness serves as a reminder for people to adhere to the norm of reciprocity.

The norm of reciprocity should precede the motivation to reciprocate as it provides an incentive (either to avoid social disapproval or to maintain one’s own standards) for receivers to reciprocate their benefactors. In contrast, the inverse relationship - where the motivation to

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reciprocate leads to a desire to adhere to the norm of reciprocity - seems less plausible. It seems less likely that people are first motivated to reciprocate, then desire to follow the norm of reciprocity. Furthermore, past literature suggests that people feel motivated to repay past favors to because they are trying to avoid both internal and external consequences, and these consequences stem from not adhering to the norm of reciprocity (Perugini et al., 2003). Therefore, it is more likely that when people feel indebted, they feel greater incentive to follow the norm of reciprocity and in turn, are more motivated to reciprocate.

H6: Indebtedness motivates reciprocation out of desire to adhere to the norm of reciprocity.

Behavioral Consequences of Indebtedness and Gratitude

If gratitude induces a desire to affiliate, this should influence subsequent behaviors. Examples of such behavior can include spending time or communicating with the beneficiary. Past studies have found that when people feel grateful towards their benefactors, they do tend to spend more time with them (Algoe et al., 2008), or are more likely to engage in behaviors to socialize with the benefactor (Bartlett et al., 2012). In one such study, participants were induced to experience gratitude by being helped by a benefactor (a confederate) while they were completing a task (Bartlett et al., 2012). After, they were told that they were taking part in another experiment where they had the choice to work alone or with the confederate. Participants who felt grateful towards the confederate were more likely to choose to work with the confederate. Similar results were found in Study 2, where participants requested to play a game of cyberball with the same confederate and another stranger. The rules of the cyberball game were designed such that they would gain more by interacting with the stranger than with their benefactor. Despite the potential losses, participants who felt grateful towards the confederate chose to engage more with the confederate than the stranger. These

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studies suggest that when people feel grateful towards their benefactors, they are more motivated to engage in behaviors that allow them to interact and affiliate more with them.

The desire to affiliate may not always be directed towards the benefactor. In the second study by Bartlett and DeSteno (2006), participants who were induced to experience gratitude were requested to help either their benefactor or a complete stranger. Results suggest that participants who experience gratitude were likely to offer their assistance to help, regardless if the help was requested by the benefactor or the stranger. Gratitude has also been found to generate upstream reciprocity, or pay-it-forward effects (Chang et al., 2012). When people experience gratitude, they are more likely to extend their prosocial tendencies towards others. Part of this tendency ties back to the broaden-and-build theory (Fredrickson, 2004a), which suggests that gratitude, being a positive emotion, broadens the person's perspective towards others. This broaden perspective blurs the boundaries between the benefactor and others, and in turn, confers the recipient an opportunity to "repay" a stranger. Based on these evidence, it can be suggested that gratitude induces a desire to affiliate with others, and in turn, perform more prosocial behavior as means to interact with others.

H7: Gratitude should be more strongly associated with affiliating with the benefactor and performing prosocial behavior towards others than indebtedness.

On the other hand, indebtedness is a negative feeling filled with discomfort and obligation. As a negative experience, indebtedness should share similar traits as other negative states. Firstly, negative states lead people to narrow and focus their attention (Eysenck, 1976) upon the sources (events, people, etc) that elicited the negative state (Schwarz, 1990). Indebtedness is associated with prevention focus (Mathews & Shook, 2013), and these prevention cues cause the receiver to focus on the potential liabilities of experience. Not adhering to the norm of reciprocity is often seen as immoral, and has potential social repercussions that subjects the recipient to negative judgments from others. Such negative

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information tends to weigh more heavily in the evaluation of others than positive judgments (Peelers & Czapinski, 1990). Hence, it seems likely that people will be motivated to reduce the elicited negative state and to prevent negative evaluation of others as quickly as possible.

According to Taylor's (1991) mobilization-minimization hypothesis, negative experiences mobilize action and behavior more quickly than positive experiences. Negative mood such as guilt, which indebtedness is strongly associated with (Watkins et al., 2006), is often accompanied by compliance to a request from others (Mayer & Salovey, 1988). Hence, in order to reduce feelings of indebtedness, recipients should be more motivated to help and repay their benefactors (Greenberg, 1980). This in turn, should drive them to search for opportunities to repay their benefactors as quickly as possible, which reduces their discomfort and allows them to feel less constrained (Gross & Latane, 1974). Based on the evidence above, it can be suggested that as the intensity of indebtedness increases, people should make more effort to repay the helper. Furthermore, indebtedness is more likely to drive this urgency than gratitude as gratitude seems to induce more emphasis on relationship building (Peng et al., 2017), which may occur at a slower pace than simply repaying a person for past favors. Furthermore, evidence suggests that the reciprocity motivated by gratitude is not viewed by recipients as a form of exchange (Watkins et al., 2006). This means that people who feel grateful do not see returning a favor as repaying their benefactor for a past favor, but instead may see it as a means to connect or to know their benefactor further (Algoe & Haidt, 2009). The evidence above suggests that indebtedness increases the urgency to reciprocate compared with gratitude. In this context, I operationalize urgency in two ways. Firstly, the urgency to reciprocate refers to how *quickly* a person repays the favor. Secondly, the urgency to reciprocate can also refer to how *likely* a person is to repay a favor received within a specified period of time. I will discuss both operationalizations in greater detail further down in the results section.

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H8: Indebtedness should be more strongly associated than gratitude with the urgency of repaying the favor.

CHAPTER 2: PILOT STUDY

Much of the research on gratitude and indebtedness has been conducted on North American and European samples (e.g. Mathews & Green, 2010; Peng et al., 2017; Watkins et al., 2006). Few studies have examined the distinctiveness of these emotions in East Asian cultures. Previous research suggests that Asians may respond to positive events with mixed emotions compared with European Americans (Miyamoto, Uchida, & Ellsworth, 2010). For instance, Japanese students experience gratitude and positive feelings when receiving favors from others. However, they also experience indebtedness and a regret for bothering others who have helped them (Naito & Sakata, 2010). In addition, Japanese also have an emotion termed *sumanai*, which is defined as a feeling of gratitude for someone's help, along with sorrow and sometimes guilt for having put them to so much trouble (Washizu & Naito, 2015). This further suggests that events that elicit gratitude in East Asian cultures, may concurrently elicit indebtedness and other negative emotions. These studies raise questions about whether gratitude and indebtedness represent distinct concepts in East Asian populations. Therefore, I conducted a pilot study to gather initial data on the distinguishability of gratitude and indebtedness in a sample of Singaporean college students.

In the pilot study, participants were asked to write a scenario where they felt either grateful or indebted. After, they were asked to assess the experience on key components such as perceived value, perceived benevolent intentions, perceived cost and perceived expectation of repayment. These benefit appraisals were used to examine how the current population would distinguish between gratitude and indebtedness

Method

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Participants for pilot study. A total of 198 participants were recruited from Singapore Management University (SMU) to participate in the 10-minute online study for research participation credit. Due to its short duration, the data of the pilot study were collected together with another 45-minute survey. The sample comprised of 138 (69.7%) females and 60 (30.3%) males, ranging in age from 18 to 28. In terms of ethnic background, 160 participants (80.8%) identified themselves as Chinese, 12 (6.1%) as Indian or 10 (5.1%) as Malay, and the remaining (8.5%) identified themselves under “Others”. Two other participants (1.0%) declined to provide this information.

Procedure and materials. Participants were randomly assigned to one of two conditions. In each condition, they were asked to recall an incident where they felt either (a) grateful or (b) indebted towards someone. Participants were also encouraged to recall and write as many details as they could during the recollection. When they had finalized and submitted their recollection, they rated their experience on several appraisals related to gratitude and indebtedness. Two items ($\alpha = .672$) tested the *perceived benevolence* of the benefactor (e.g., “X was sincerely motivated to help me”). Two items ($\alpha = .718$) tested the participant’s *perceived value* of the favor (e.g., “This favor was valuable to me”). Two items ($\alpha = .618$) tested the *perceived cost* of the favor in time, effort, and money (e.g., “X exerted effort to help me”). Three items ($\alpha = .741$) tested how much the participant perceived their benefactor *expects repayment* (e.g., “After receiving the favor, I felt pressured to repay X”). Finally, participants rated how grateful (indebted) they felt (e.g., “After receiving the favor, I felt grateful (indebted) toward X”). All participants rated their experiences on a 5-point scale (1 = *Not at all*; 5 = *A great deal*).

Results

Participants in the gratitude condition ($M = 4.56$, $SD = .602$) did not report feeling more grateful than those in the indebtedness condition ($M = 4.60$, $SD = .595$, $t[196] = -.542$, p

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= .588, $d = .067$). However, participants in the indebtedness condition ($M = 4.05$, $SD = .911$) reported feeling more indebted than those in the gratitude condition ($M = 3.38$, $SD = 1.195$, $t[164] = -4.356$, $p < .001$, $d = 0.631$). These results suggest that experiencing indebtedness may be accompanied by fairly high levels of gratitude; but experiencing gratitude need not be accompanied by high levels of indebtedness. In addition, gratitude and indebtedness were modestly correlated at $r = .198$, $p = .005$. As the correlation is not high, it suggests that the two emotions are not synonymous with each other. These results provide initial evidence that Singaporean students do make distinctions between gratitude and indebtedness. To better understand these distinctions, I conducted additional comparisons on the appraisals of the experiences.

Mean differences in appraisals. Participants in the gratitude condition ($M = 2.86$, $SD = .996$) perceived less expectation of repayment than those in the indebtedness condition ($M = 3.18$, $SD = 1.044$, $t[196] = -2.170$, $p = .031$, $d = 0.313$). This suggests that when people experienced indebtedness, they are more likely to believe their benefactors expect repayment from them than when they experience gratitude. However, no differences were observed in the perceived benevolence of benefactors, perceived cost of the favor, or perceived value of favor (see Table 1).

The lack of mean differences between gratitude and indebtedness experiences might suggest that the appraisals examined do not distinguish the two emotions. However, it is important to note that when participants were asked to recall an experience where they felt indebted, they also tended to experience gratitude. Thus it is possible that some effects of indebtedness on appraisals were at least partly due to accompanying feelings of gratitude. Hence, to further differentiate between both emotions, I examined their unique relation with benefit appraisals.

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Regression of benefit appraisals on gratitude and indebtedness. To start, I ran correlations among gratitude, indebtedness and the benefit appraisals. As seen in Table 2, Gratitude was significantly associated with perceived benevolence while indebtedness was significantly associated with perceived expected repayment. At the same time, both gratitude and indebtedness were significantly associated with both perceived cost and perceived value.

After, I tested a series of models predicting benefit appraisals from both self-reported gratitude and indebtedness, combining participants from both conditions. Gratitude was significantly associated with perceived benevolence ($b = .631, SE = .085, p < .001$), while indebtedness was not ($b = .020, SE = .046, p = .657$). In contrast, indebtedness was significantly associated with expectation of repayment ($b = .523, SE = .057, p < .001$), whereas gratitude was not ($b = -.096, SE = .106, p = .364$).

Both gratitude ($b = .602, SE = .073, p < .001$) and indebtedness ($b = .098, SE = .040, p = .015$) were associated with perceived cost. However there was a significant difference between the two slopes ($t[195] = 5.578, p < .001$). This suggests that gratitude has a stronger association with perceived cost than indebtedness.

Finally, gratitude ($b = .631, SE = .066, p < .001$) but not indebtedness ($b = .054, SE = .036, p = .135$) was significantly associated with perceived value. Thus gratitude is uniquely related to the perceived value of a favor. In contrast, feelings of indebtedness were not related to perceived value above and beyond gratitude.

Discussion

The results of the pilot study suggest that Singaporean students do differentiate between gratitude and indebtedness. The lack of mean differences might suggest that gratitude and indebtedness are similar on most of the benefit appraisals. However, the correlation between gratitude and indebtedness suggests that the effects of indebtedness on appraisals are partly due to accompanying feelings of gratitude. The regression analyses

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provide more evidence on the differences between both emotions. Results suggest that gratitude is more strongly associated with perceived benevolence and perceived value while indebtedness is more strongly associated with perceived expected repayment. Both gratitude and indebtedness are related to perceived cost. However, the relation between gratitude and perceived cost is stronger than the relation between indebtedness and perceived cost.

Several issues remain. Firstly, although gratitude and indebtedness are associated with each other, they can be distinguished on the basis of perceived benevolence and perceived expectation of repayment. Secondly, perceived cost was associated with both gratitude and indebtedness. This suggests the possibility that distinct processes underlie the association of perceived cost with gratitude and indebtedness. Third, the pilot study differentiated gratitude and indebtedness using only benefit appraisals. Theoretically, both emotions may also have distinct effects on motivation and behavior. Finally, the pilot study used an experimental design where participants recalled an incident in which they felt strongly grateful or indebted. However, in daily life, people can experience a range of events that elicit both emotions to varying extents. Therefore, the main study addresses these key research questions.

CHAPTER 3: MAIN STUDY METHODS

A two-week diary study was conducted. Every two days, participants reported a favor they received, their feelings of gratitude and indebtedness, benefit appraisals, motivation to affiliate and repay the benefactor, and reciprocation behavior.

Participants

A total of 196 participants were recruited for this study through online recruitment. Participants were offered 2 psychology course credit and up to \$5.60 for completing the study. The sample comprised of 133 (67.9%) females and 63 (32.1%) males, ranging in age from 18 to 27. Out of the 198 participants, majority (83.3%) identified themselves as Chinese, 10 (4.8%) as Indian or 15 (7.2%) as Malay, and the remaining (4.7%) identified themselves under “Others”.

Materials

Individual difference measures.

Gratitude Questionnaire-6. The Gratitude Questionnaire 6 (GQ-6; McCullough, Emmons & Tsang, 2002) consists of 6 self-report items ($\alpha = .822$) to assess how grateful people are in general (e.g., “I have so much in life to be thankful for”). Participants rated how strongly they agreed with each statement on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*).

Mini International Personality Item Pool (Mini-IPIP). To assess Extraversion, Agreeableness and Neuroticism, 12 items from the Mini-IPIP were used (Donnellan, Oswald, Baird, & Lucas, 2006). Sample items included “Am the life of the party” for extraversion (4 items; $\alpha = .851$), “sympathize with others’ feelings” for agreeableness (4-items; $\alpha = .713$) and “Have frequent mood swings” for neuroticism (4-items; $\alpha = .759$). Participants rated the

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accuracy and applicability of each statement from 1 (*Very Inaccurate*) to 5 (*Very Accurate*).

The rationale for including the Mini-IPIP is to control for extraversion, agreeableness and neuroticism as these three traits are associated with trait gratitude (McCullough et al., 2002) and relationship satisfaction (Heller, Watson, & Ilies, 2004; Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010; Tov, Nai, & Lee, 2016).

Subjective Happiness Scale (SHS). The SHS is a 4-item ($\alpha = .916$) scale to assess participants' tendency to experience positive emotions (Lyubomirsky & Lepper, 1999). Participants rated the accuracy and applicability of each statement on 7-point scales specific to each item.

Social Approach and Avoidance Scale (SAAS). The SAAS is an 8-item scale that assesses participants' tendency to engage in social approach behaviors or social avoidance behaviors (Elliot, Gabel & Mapes, 2006). Social approach behaviors (4-item; $\alpha = .856$) include "I try to deepen my relationship with others". Social avoidance behaviors (4-items; $\alpha = .749$) include "I try to stay away from situations that could harm my relationships with others". Participants rated each statement from 1 (*Not True of Me at All*) to 7 (*Very True of Me*).

Marlow-Crowne Social Desirability Scale. The Marlow-Crowne is a 33-item ($\alpha = .595$) scale that assesses participants' tendency to portray themselves as socially desirable (Reynolds, 1982). People who have stronger tendencies to portray themselves as socially desirable individuals are more likely to respond to these items in a way that portrays them as responsible and near perfect individuals. Sample items include "I always try to practice what I preach" and "I am always careful about my manner of dress". Participants rated the accuracy and applicability of each statement from 1 (*Not True of Me at All*) to 7 (*Very True of Me*).

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Diary survey. Every two days, participants reported a favor they received over the past two days, and rated various aspects of their experience. Unless noted otherwise, all items used a 5-point response scale (1 = *Not at all*; 5 = *A great deal*).

Emotional reaction. Participants rated how *grateful* and *indebted* they felt towards their benefactor when they received the favor.

Benefit appraisals. Three items ($\alpha = .815$) tested the *perceived benevolence* of the benefactor (e.g., X was concerned with your welfare). Two items ($\alpha = .706$) asked how much the benefactor *expected repayment* (e.g., X helped because he/she wanted something in return). Three items ($\alpha = .616$) tested the *perceived cost* of the favor in time, effort, and money (e.g., X exerted effort to help me). Two items ($\alpha = .613$) tested the *perceived value* of the favor (e.g., This favor was valuable to me). Three items ($\alpha = .642$) tested the *perceived responsiveness* of the benefactor (e.g., X made me feel cared for.).

Favor solicitation. Participants reported ('yes' or 'no') whether they solicited the favor (e.g. Did you ask X to help you for this favor?). This item was used as a control variable, as favor solicitation may potentially influence how people appraise favors. People tend to appreciate help more when in need (Converse & Fishbach, 2012).

Benefactor assessment. Participants report their relationship with the benefactor (friend, family, etc.), how long they have known their benefactor, and how close they are with their benefactor.

Post-favor motivation. Participants reported whether they have reciprocated the favor. If yes, they were asked how motivated they *were* to reciprocate the favor. If no, they were asked how motivated they *are* to reciprocate the favor. Participants were asked to respond to either item on a 5-point scale (0= *Not at all*; 5= *A great deal*). If their response was '0', they were asked why they were (are) not motivated to reciprocate through an open-ended question.

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If their response ranged from '1' to '5', they rated their desire to adhere to the norm of reciprocity and their desire to affiliate.

Desire to affiliate. Three items ($\alpha = .831$) tested the participants' desire to affiliate with his (her) benefactor when reciprocating the favor (e.g. I would like to spend more time with X).

Desire to adhere to the norm of reciprocity. Five items ($\alpha = .826$) tested the participants' desire to adhere to the norm of reciprocity when reciprocating the favor (e.g. I would feel uncomfortable if I did not reciprocate).

Follow-up survey. In the week following the diary period, participants reported on their behaviors following the favors received in the previous week.

Reciprocation behavior. Participants were shown all the favors they previously reported in the diary surveys. They indicated whether they have reciprocated the favor. If 'yes', they were prompted to recall the date they reciprocated, and how they reciprocated. Participants also completed 6-items assessing how equitable they felt their reciprocation of the favor was (1= *Not at all*; 5= *Very Much*).

Affiliation with benefactor. Participants reported how much time they spent socializing with each benefactor in the past week (1= *Less than 1 hour*; 7 = *More than 10 hours*). There were 2 items ($\alpha = .738$; including how much time they spent interacting with the benefactor, how much time they spent in the company of the benefactors).

General prosocial behavior. Participants reported their helping behavior in general to investigate pay-it-forward effects. These 2 items ($\alpha = .779$) ask (i) how often they *offered* to help and (ii) how often they were *asked* to help people other than their benefactors. Participants responded to both items on a 7-point scale (1= *Did not provide help at all*; 7 = *More than 10 times*).

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Procedure

The study was conducted in 3 phases. All phases of the study were completed in the online survey platform, Qualtrics. Phase 1 involves a 30-minute survey session. Participants were briefed on the procedures of the study. After, they were asked to complete the individual difference measures. Two to three days later, participants commenced Phase 2. In Phase 2, participants were emailed a Qualtrics link to the diary survey every two days over 14 days. Two to three days after Phase 2, participants commenced Phase 3. On average, participants completed 6.45 out of 7 surveys.

CHAPTER 4: MAIN STUDY RESULTS

The data collected is of a multilevel nature – where repeated measurements are nested within individuals. The lower level is the diary level; the upper level is the person level. The diary level data points are nested under the participant that reported them (i.e., the person level). Data were analyzed via general estimating equation (GEE) through SAS version 9.5. We used the GEE model as we were unable to estimate a random intercept for the multilevel analyses where indebtedness was either an independent or dependent variable. The GEE computes regression coefficient estimates from a single-level general linear model. At the same time, it estimates fewer parameters but still accounts for the clustering effects of multilevel models and corrects for these effects by adjusting the final beta value (McNeish, Stapleton, & Silverman, 2017).

Correlations for the diary-level variables can be viewed in Table 3. In addition, the correlations between the diary-level variables and the person-level (personality) variables can be viewed in Table 4. Subjective happiness and social desirability were not associated with any of the diary-level variables. Hence, both variables were excluded as control variables. The remaining personality variables – trait gratitude, extraversion, agreeableness, social approach and social avoidance – were included in the models as control variables. Finally, favor solicitation and the amount of time participants have known the benefactor were also included as control variables as they have been found to influence perceived value and affiliative behavior. All analyses were conducted twice – once with control variables and once without. Unless otherwise stated, the relations between variables remained the same. The results below have partialled out the effects of control variables.

Benefit Appraisals, Gratitude and Indebtedness

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H1a: Perceived benevolence is positively associated with gratitude. Consistent with the prediction of Hypothesis 1a, perceived benevolence was positively associated with gratitude ($b = .313, SE = .039, p < .001$), suggesting that when people believe their benefactors are helping them with benevolent intentions, they experience more gratitude. The association between perceived benevolence and gratitude remained significant even after controlling for indebtedness ($b = .242, SE = .038, p < .001$).

To differentiate between gratitude and indebtedness, I conducted another analysis predicting indebtedness from perceived benevolence. In this analysis, I included gratitude as a control variable. The association between perceived benevolence and indebtedness was significant even after controlling for gratitude ($b = .280, SE = .053, p < .001$).

H1b: The effect of perceived benevolence on gratitude is mediated by perceived responsiveness. Mediation analysis was conducted using the PRODCLIN Macro in SAS 9.4 to construct confidence intervals around the indirect effects (Path A*Path B). When both paths a and b were both significant, I proceeded to test the indirect effect (ab) by computing a 95% confidence interval using the distribution of the product method (MacKinnon, Fritz, Williams, & Lockwood, 2007).

The model included perceived benevolence as the predictor of perceived responsiveness (Path A), and perceived responsiveness as a predictor of gratitude (Path B). Supporting Path A, perceived benevolence was significantly associated with perceived responsiveness ($b = .543, SE = .034, p < .001$). Supporting Path B, perceived responsiveness was associated with gratitude ($b = .240, SE = .036, p < .001$). The 95% confidence interval for the indirect effect did not include zero 95% CI [.089, .174], suggesting a significant indirect effect of perceived benevolence on gratitude through perceived responsiveness. This suggests that when people believe their benefactors helped them with benevolent intentions, they perceived their benefactors to be more responsive towards their needs and feel more

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grateful. However, the direct effect of perceived benevolence on gratitude was still significant, ($b = .175$, $SE = .039$, $p < .001$). Thus, perceived responsiveness may not be the only reason why benevolent intentions predicted gratitude.

As gratitude and indebtedness were correlated ($r = .358$, $p < .001$), I repeated the analysis including indebtedness as a control variable. Both Path A ($b = .500$, $SE = .035$, $p < .001$) and Path B remained significant ($b = .197$, $SE = .037$, $p < .001$) even after controlling for indebtedness. The indirect effect of benevolent intentions on gratitude remained significant, 95% CI [.061; .139].

In order to differentiate further between gratitude and indebtedness, I conducted another set of mediation analysis looking at the association between perceived benevolence and indebtedness through perceived responsiveness. I included gratitude in this model as a covariate. For Path A, perceived benevolence was significantly associated with perceived responsiveness ($b = .468$, $SE = .034$, $p < .001$). For Path B, perceived responsiveness was associated with indebtedness ($b = .196$, $SE = .0686$, $p = .004$). The indirect effect of perceived benevolence on indebtedness through perceived responsiveness was significant 95% CI [.029, .158]. Similar to gratitude, perceived benevolence and indebtedness are also associated via perceived responsiveness. The direct effect of perceived benevolence on indebtedness also remained significant, ($b = .186$, $SE = .060$, $p < .001$). Thus there may be additional mechanisms between perceived benevolence and indebtedness that can be further explored.

H2: Perceived expectation of repayment should be positively associated with indebtedness. Consistent with the prediction of Hypothesis 2, perceived expected repayment was positively associated with indebtedness ($b = .195$, $SE = .043$, $p < .001$), suggesting that that when people believe their benefactors expect repayment for helping them, they tend to feel more indebted. These results remained consistent even after controlling for gratitude.

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Perceived expected repayment remained positively associated with indebtedness ($b = .198$, $SE = .040$, $p < .001$).

To distinguish between both gratitude and indebtedness, I conducted another analysis predicting gratitude from perceived expected repayment. Indebtedness was not included in this analysis as a control variable. Perceived expected repayment was not significantly associated with gratitude ($b = .000$, $SE = .025$, $p = .984$). These results suggest that there is little to no association between perceived expected repayment and gratitude. When people believe their benefactors have higher perceived expected repayment, it does not influence how grateful they feel.

H3a: Perceived cost to benefactor should be positively associated with gratitude.

Consistent with the prediction of Hypothesis 3a, perceived cost to the benefactor was positively associated with gratitude ($b = .106$, $SE = .020$, $p < .001$), suggesting that when people believe their benefactors incur greater cost when helping them, they experience more gratitude. The association between perceived cost and gratitude remained even after controlling for indebtedness ($b = .040$, $SE = .020$, $p = .043$). As H4 directly tests the association between gratitude, indebtedness and perceived cost, I did not conduct a separate model to predict perceived cost from indebtedness.

H3b: The effect of perceived cost on gratitude is mediated by perceptions of how responsive the helper is. The model included perceived cost as the predictor of perceived responsiveness (Path A), and perceived responsiveness as a predictor of gratitude (Path B).

Supporting Path A, perceived cost was significantly associated with perceived responsiveness ($b = .166$, $SE = .025$, $p < .001$). Supporting Path B, perceived responsiveness was associated with gratitude ($b = .333$, $SE = .036$, $p < .001$). The indirect effect perceived cost on gratitude (A*B) was significant, 95%CI [.036, .077]. This suggests that benefactors who incurred greater costs to help participants were more likely to be perceived as responsive

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to their needs, resulting in higher levels of gratitude. However, the direct effect of perceived cost on gratitude was still significant, ($b = .046$, $SE = .019$, $p = .014$). I repeated the analysis including indebtedness as a control variable. Path A ($b = .110$, $SE = .024$, $p < .001$), Path B ($b = .274$, $SE = .037$, $p < .001$), and the indirect effect remained significant, 95% CI [.016; .046], even after controlling for indebtedness.

I conducted another set of mediation analysis looking at the association between perceived cost and indebtedness through perceived responsiveness. I included gratitude in this model as a control variable. For Path A, perceived cost was significantly associated with perceived responsiveness ($b = .124$, $SE = .023$, $p < .001$). For Path B, perceived responsiveness was associated with indebtedness ($b = .231$, $SE = .067$, $p < .001$). The indirect effect of perceived cost on indebtedness through perceived responsiveness was significant 95% CI [.011, .050]. This result suggests that similar to gratitude, perceived cost and indebtedness are also associated via perceived responsiveness. The direct effect of perceived cost on indebtedness also remained significant, ($b = .240$, $SE = .046$, $p < .001$).

H4: Perceived cost is more strongly associated with Indebtedness than Gratitude.

Perceived cost was significantly associated with indebtedness ($b = .325$, $SE = .045$, $p < .001$). As reported earlier (H3a), perceived cost was also associated with gratitude. Hence to test H4, I tested another model regressing perceived cost on indebtedness and gratitude. This analysis allowed me to conduct a contrast analysis comparing the unique effects of gratitude and indebtedness. Results suggest that perceived cost was uniquely associated with both gratitude ($b = .091$, $SE = .045$, $p = .045$) and indebtedness ($b = .226$, $SE = .036$, $p < .001$). The contrast analysis suggested that both coefficients were significantly different

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($\chi^2(1) = 3.95, p = .047$)¹. Although perceived cost was associated with both gratitude and indebtedness, it seems to have a stronger association with indebtedness.

However, as hypothesized in H3b, perceived responsiveness was expected to account for the relation of perceived cost to gratitude. Therefore, I conducted another set of analyses to compare the association of perceived cost with gratitude and indebtedness after controlling for perceived responsiveness. Indebtedness remained positively associated with perceived cost ($b = .201, SE = .037, p < .001$). On the other hand, gratitude was no longer significantly associated with perceived costs after controlling for perceived responsiveness ($b = .016, SE = .051, p = .748$). This suggests a more direct relation of perceived cost with indebtedness than with gratitude.

Motivational Differences between Gratitude and Indebtedness.

H5: Gratitude motivates reciprocity through the desire to affiliate. Two models tested gratitude as a predictor of desire to affiliate (Path A), and the desire to affiliate as a predictor of the motivation to reciprocate (Path B). This set of analyses was done twice to account for favors that had already been reciprocated in Phase 2 and favors that had not yet been reciprocated at Phase 2.

Favors already reciprocated at Phase 2. Supporting Path A, gratitude was significantly associated with the desire to affiliate ($b = .454, SE = .072, p < .001$). Supporting Path B, the desire to affiliate was associated with the motivation to reciprocate ($b = .396, SE = .098, p < .001$). The indirect effect of gratitude through desire to affiliate was significant, 95% CI [.086, .292]. However, the direct effect of gratitude on the motivation to reciprocate was still significant ($b = .353, SE = .097, p < .001$). I repeated the analysis including indebtedness as a control variable. Both Path A ($b = .376, SE = .078, p < .001$), Path B (b

¹ Without control variables, perceived cost was associated with both gratitude ($b = .140, SE = .046, p = .003$) and indebtedness ($b = .213, SE = .037, p < .001$). The contrast analysis suggested that both coefficients were not significantly different ($\chi^2[1] = 1.12, p = .291$).

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= .351, $SE = .100$, $p < .001$), and the indirect effect, 95% CI [.052; .233], remained significant after controlling for indebtedness.

Another set of analyses between indebtedness and the motivation to reciprocate via the desire to affiliate was conducted. Gratitude was included in this analysis as a control variable. For Path A, indebtedness was significantly associated with the desire to affiliate ($b = .106$, $SE = .048$, $p = .028$). For Path B, the desire to affiliate was associated with the motivation to reciprocate ($b = .351$, $SE = .100$, $p < .001$). The indirect effect of indebtedness through desire to affiliate was significant, 95% CI [.004, .082], as was the direct effect of indebtedness on the motivation to reciprocate ($b = .198$, $SE = .056$, $p < .001$).

Favors not yet reciprocated at Phase 2. Supporting Path A, gratitude was significantly associated with the desire to affiliate ($b = .359$, $SE = .061$, $p < .001$). Supporting Path B, the desire to affiliate was associated with the motivation to reciprocate ($b = .488$, $SE = .054$, $p < .001$). The indirect effect of gratitude through desire to affiliate was significant, 95% CI [.110, .249]. However, the direct effect of gratitude on motivation to reciprocate was still significant, ($b = .329$, $SE = .729$, $p < .001$). I repeated the analysis including indebtedness as a control variable. Both Path A ($b = .233$, $SE = .064$, $p < .001$), Path B ($b = .378$, $SE = .048$, $p < .001$), and the indirect effect, 95% CI [.038; .144], remained significant even after controlling for indebtedness.

Another set of analyses between indebtedness and the motivation to reciprocate via the desire to affiliate was conducted controlling for gratitude. For Path A, indebtedness was significantly associated with the desire to affiliate ($b = .206$, $SE = .040$, $p < .001$). For Path B, the desire to affiliate was associated with the motivation to reciprocate ($b = .378$, $SE = .048$, $p < .001$). The indirect effect of indebtedness through desire to affiliate was significant, 95% CI [.044, .116], as was the direct effect of indebtedness on the motivation to reciprocate ($b = .388$, $SE = .051$, $p < .001$).

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The results suggests that when people feel grateful towards their benefactors, they experience a greater desire to affiliate with and maintain contact with their benefactors. As a result, they are more motivated to repay their benefactors for the help provided. This was true whether motivation was assessed retrospectively (for favors already reciprocated) or prospectively (for favors not yet reciprocated). The results further suggest that when people feel indebted towards their benefactors, they also experience a greater desire to affiliate and maintain contact with their benefactors. This in turn, motivates them to repay their benefactors for the help provided. The indirect effects of gratitude and indebtedness were independent of each other. Based on these results, it is important to acknowledge that the desire to affiliate seems to mediate the effects of *both* gratitude and indebtedness.

H6: Indebtedness motivates reciprocity through the desire to adhere to the norm of reciprocity. Two models tested indebtedness as a predictor of desire to adhere to the norm of reciprocity (Path A), and the desire to adhere to the norm of reciprocity as a predictor of the motivation to reciprocate (Path B). This set of analyses was done twice to account for favors that had been reciprocated and favors that have not been reciprocated.

Favors already reciprocated at Phase 2. Supporting Path A, indebtedness was significantly associated with the desire to adhere to the norm of reciprocity ($b = .323$, $SE = .051$, $p < .001$). Supporting Path B, the desire to adhere to the norm of reciprocity was associated with the motivation to reciprocate ($b = .276$, $SE = .085$, $p = .001$). The indirect effect of indebtedness through desire to adhere to the norm of reciprocity was significant, 95% CI [.034 .157]. However, the direct effect of indebtedness on the motivation to reciprocate was still significant, ($b = .218$, $SE = .054$, $p < .001$). I repeated the analysis including gratitude as a control variable. Both Path A ($b = .325$, $SE = .055$, $p < .001$), Path B ($b = .276$, $SE = .085$, $p < .001$), and the indirect effect, 95% CI [.033; .157], remained significant even after controlling for gratitude.

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I conducted another set of analyses between gratitude and the motivation to reciprocate via the desire to adhere to the norm of reciprocity. Indebtedness was included in this analysis as a control variable. For Path A, gratitude was not significantly associated with the desire to adhere to the norm of reciprocity ($b = .019$, $SE = .080$, $p = .814$). As path A was not significant, I did not conduct the follow up mediation analyses.

Favors not yet reciprocated at Phase 2. Supporting Path A, indebtedness was significantly associated with the desire to adhere to the norm of reciprocity ($b = .385$, $SE = .043$, $p < .001$). Supporting Path B, the desire to adhere to the norm of reciprocity was associated with the motivation to reciprocate ($b = .446$, $SE = .060$, $p < .001$). The indirect effect of indebtedness through the desire to adhere to the norm of reciprocity was significant, 95% CI [.116, .234]. However, the direct effect of indebtedness on the motivation to reciprocate was still significant, ($b = .339$, $SE = .060$, $p < .001$). I repeated the analysis including gratitude as a control variable. Both Path A ($b = .370$, $SE = .044$, $p < .001$), Path B ($b = .436$, $SE = .060$, $p < .001$), and the indirect effect, 95% CI [.108; .228], remained significant even after controlling for gratitude.

Another set of analyses between gratitude and the motivation to reciprocate via the desire to adhere to the norm of reciprocity was conducted, controlling for indebtedness. For Path A, gratitude was not significantly associated with the desire to adhere to the norm of reciprocity ($b = .068$, $SE = .049$, $p = .165$). As path A was not significant, I did not conduct the follow up mediation analyses.

The results suggests that when people feel indebted, they report a greater desire to adhere to the norm of reciprocity. As a result, they are more motivated to repay their benefactors for the help provided, presumably to remove uncomfortable feelings of obligation. Again, the indirect effect of indebtedness through the norm of reciprocity applied to both retrospective and prospective assessments of motivation. However, in both analyses, the

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direct effect of indebtedness on the motivation to reciprocate remained significant. This suggests that the desire to adhere to the norm of reciprocity may not be the only reason why people feel indebted towards their benefactors. The additional analyses also suggest that gratitude is not associated with the desire to adhere to the norm of reciprocity. It seems that this desire is unique to indebtedness.

H7: Compared with indebtedness, gratitude should be more strongly associated with affiliating with the benefactor and performing prosocial behavior towards others.

Both gratitude ($b = .380, SE = .112, p < .001$) and indebtedness ($b = .144, SE = .060, p = .017$) were positively associated with the amount of time spent with the benefactor. However, contrary to Hypothesis 7, the contrast analysis did not suggest that gratitude had a stronger effect than indebtedness on affiliation with the benefactor ($\chi^2(1) = 2.59, p = .108$). In addition, as indebtedness was still associated with affiliative behavior, it suggests that the effect of indebtedness on affiliative behaviors is independent of gratitude.

Contrary to the prediction in Hypothesis 7, neither gratitude ($b = .042, SE = .041, p = .299$) nor indebtedness ($b = -.022, SE = .025, p = .366$) was significantly associated with general prosocial behavior.

H8: Indebtedness should be more strongly associated with the urgency to reciprocate the favor than gratitude. As mentioned in the introduction, I operationalized the urgency to reciprocate in two ways. Firstly, the urgency to reciprocate can refer to how *quickly* a person repays the favor. I refer to this measure as reciprocation delay. Secondly, the urgency to reciprocate can also refer to how *likely* a person is to repay a favor received within a specified period of time. I assessed this via the likelihood of immediate reciprocation, and the likelihood of delayed reciprocation.

Reciprocation delay. I computed reciprocation delay by taking the number of days between the date the favor was given and the date the favor was reciprocated according to

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participants' recollection at Phase 3. Results suggest that neither gratitude ($b = -.460$, $SE = .548$, $p = .402$) nor indebtedness ($b = -.228$, $SE = .223$, $p = .306$) were associated with reciprocation delay.

Likelihood of immediate reciprocation. For each survey in Phase 2, participants reported a favor they had received over the past 2 days. Immediate reciprocation refers to favors that had already been reciprocated when the favor was reported. As immediate reciprocation is a dichotomous variable (Yes or No), I used a logistic GEE model. Neither gratitude ($b = .131$, $SE = .142$, $p = .357$) nor indebtedness ($b = .105$, $SE = .082$, $p = .200$) were associated with likelihood of immediate reciprocation.

Likelihood of delayed reciprocation. In Phase 3, participants were shown the favors they reported in Phase 2. Delayed reciprocation refers to favors that were not yet reciprocated in Phase 2 but were reciprocated by Phase 3. Gratitude was not associated with the likelihood of delayed reciprocation ($b = .048$, $SE = .144$, $p = .738$). On the other hand, indebtedness was positively associated with the likelihood of delayed reciprocation ($b = .202$, $SE = .082$, $p = .013$). However, contrary to the prediction of hypothesis 8, the contrast analysis suggested that both coefficients were not significantly different, $\chi^2(1) = 0.620$, $p = .430$.

Additional analyses on perceived value. The pilot study showed that both gratitude and indebtedness were associated with perceived value. To determine the replicability of these effects, I tested these associations in the main study.

Both gratitude ($b = .482$, $SE = .045$, $p < .001$) and indebtedness ($b = .119$, $SE = .023$, $p < .001$) were positively associated with perceived value, with a larger coefficient for gratitude as observed in the pilot study, $\chi^2(1) = 29.08$, $p < 0.001$. Although gratitude and indebtedness were both associated with perceived value, the effect of gratitude was stronger.

In addition, perceived value was associated with perceived responsiveness. I conducted a mediation analysis testing the indirect effect of perceived value on gratitude

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through perceived responsiveness, controlling for indebtedness. Path A was significant:

perceived value was associated with perceived responsiveness ($b = .596, SE = .039, p < .001$).

Path B was also significant: perceived responsiveness was associated with gratitude ($b = .073,$

$SE = .035, p < .001$). The indirect effect of perceived value on gratitude was significant, 95%

CI [.002; .086]. This suggests that the more instrumentally beneficial the favor, the more

responsive people perceive their benefactors to be. This in turn, contributed to the amount of

gratitude they experienced.

I conducted another set of mediation analysis looking at the association between perceived value and indebtedness through perceived responsiveness, controlling for gratitude.

For Path A, perceived value was significantly associated with perceived responsiveness (b

$= .585, SE = .042, p < .001$). For Path B, perceived responsiveness was associated with

indebtedness ($b = .179, SE = .074, p < .001$). The indirect effect of perceived value on

indebtedness through perceived responsiveness was significant 95%CI [.020, .193]. This

result suggests that similar to gratitude, perceived value and indebtedness are also associated

via perceived responsiveness.

CHAPTER 5: DISCUSSION

In this study, I tested how benefit appraisals predicted gratitude and indebtedness (H1 to H4). I also tested how gratitude and indebtedness motivate the reciprocation via the desire to affiliate (H5) and the desire to adhere to the norm of reciprocity (H6). Finally, I tested the association between gratitude, indebtedness and behavioral consequences, including behavioral affiliation and prosocial behavior (H7) and behavioral reciprocity (H8).

Consistent with my predictions, perceived benevolence was positively associated with gratitude (H1a). In addition, the effect of perceived benevolence on gratitude was mediated by perceived responsiveness (H1b). In contrast, perceived expectation of repayment was positively associated with indebtedness (H2), but not gratitude. Perceived cost was positively associated with gratitude (H3a), and the relation of perceived cost on gratitude was mediated by perceived responsiveness (H3b). H4 received mixed support. Indebtedness had a significantly stronger association with perceived cost than gratitude only when control variables were included in the model (Footnote 1). However, the effect of perceived cost on gratitude was fully mediated by perceived responsiveness, while the effect of perceived cost on indebtedness remained strong even after controlling for perceived responsiveness. This implies that even if the favor does not fulfill our needs, we can still feel indebted if benefactors were perceived as expending much time and money to help us.

The predictions on how gratitude and indebtedness influence different motivations and behaviors were partially supported. Gratitude motivated reciprocity partially through the desire to affiliate (H5). Gratitude was also associated with affiliative behavior, where higher levels of gratitude predicted more time spent interacting with their benefactors. This relation between gratitude and affiliative behavior was larger than the relation between indebtedness

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and affiliative behavior (H7). However, the difference was not statistically significant ($p = .108$). Indebtedness, on the other hand, motivated reciprocity, in part, out of a desire to adhere to the norm of reciprocity (H6). This desire to adhere to the norm of reciprocity may increase people's likelihood of reciprocating their benefactors as indebtedness was associated with an increased likelihood of repaying their benefactors at the end of the study (delayed reciprocation; H8).

Contrary to my predictions, neither gratitude nor indebtedness were associated with general prosocial behavior (H7). Neither emotion was associated with immediate reciprocation or amount of time taken to repay benefactors for the favors performed (H8). Furthermore, additional analyses revealed many similarities between gratitude and indebtedness. Both emotions were uniquely associated with perceived benevolence, perceived cost and perceived value. In addition, these three appraisals were indirectly associated with gratitude and indebtedness via perceived responsiveness. Although gratitude motivated reciprocity through desire to affiliate and was associated with spending more time with benefactors, similar effects were observed for indebtedness. Despite these similarities, perceived expected repayment remained uniquely associated with indebtedness, but shared no unique association with gratitude. Gratitude was also not uniquely associated with the desire to adhere to the norm of reciprocity. Despite these differences, it is important to acknowledge similarities in gratitude and indebtedness. I will discuss these similarities in subsequent sections of the Discussion.

Based on the results above, this dissertation has two major implications for research on gratitude and indebtedness. The first, is that it provides a better understanding of how gratitude and indebtedness work *in tandem* to influence social behavior. The second implication is that it provides a better understanding of the process of gratitude, indebtedness, and reciprocity in daily life.

Understanding how Gratitude and Indebtedness Influence Social Relationships

Benefit appraisals, gratitude and indebtedness and their role in social relationships. Gratitude is more consistently associated with perceived benevolence than indebtedness. In addition, gratitude is also strongly associated with perceived cost and perceived value. These three benefit appraisals bring some insight into how gratitude affects social relationships. Perceived value, benevolence and cost may serve as indicators to identify good and supportive relational partners. In this study, all three benefit appraisals are associated with gratitude via perceived responsiveness. This is in line with a previous study in which higher levels of gratitude were reported in response to highly responsive benefactors (Algoe et al., 2008). The current study extends this finding by providing evidence that benefit appraisals may be antecedents to perceived responsiveness. That is, people believe that their partners are more responsive when their partners help them (a) to attain valued outcomes, (b) with sincere intentions and (c) are willing to sacrifice their resources to help them. When these three aspects are met, people believe their partners understand their needs and in turn, feel more appreciative towards their partners in the relationship. Future research can test whether enhancing such benefit appraisals subsequently enhances responsiveness and gratitude in relationships.

On the other hand, perceived expectation of repayment and perceived cost are both benefit appraisals that are more strongly related to indebtedness than gratitude. Indebtedness has been proposed as a way to ensure equal exchanges in relationship (Greenberg, 1980). Hence, it is plausible that perceived expected repayment serves as a reminder for people to adhere to the norm of reciprocity and repay the benefactor. On the other hand, perceived cost could be a complementary mechanism that serves as a gauge for equal exchange, as it is important to neither undercompensate nor overcompensate for the favor. When undercompensating for a favor, the benefactor might feel resentment from the unequal

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exchange of benefits and outcomes. On the other hand, when overcompensating for a favor, the benefactor might perceive the receiver to have lower levels of moral orientation (Haesevoets, Van Hiel, Folmer, & De Cremer, 2014), or ulterior motives. Both under and overcompensation are seen as violations to the norm of reciprocity. Hence, I believe that perceived cost plays an important role in ensuring an equal exchange whilst reciprocating. Appraisals of the benefactor and the favor received influence the degree of gratitude and indebtedness experienced. These emotions in turn, were hypothesized to have distinctive effects on motivation and behavior

Gratitude and indebtedness affect motivation and behaviors in relationships.

After receiving a favor, people can experience both gratitude and indebtedness, which may then guide subsequent actions in a relationship. In this study, both gratitude and indebtedness motivated reciprocity through the desire to affiliate. In addition, indebtedness also motivated reciprocity via the desire to adhere to the norm of reciprocity. These findings are consistent with the notion that gratitude helps people to find and maintain their relationships, while indebtedness acts as a warning signal to ensure people perform equal social exchanges. However, the findings also qualify previous researching linking gratitude with promotion focus and indebtedness with prevention focus (Mathews & Shook, 2013). Social approach motives are promotion focused and the desire to affiliate has been found to predict more positive social events in a relationship and greater relationship satisfaction (Elliot, Gable, & Mapes, 2006). The main study suggests that *both* gratitude and indebtedness may increase one's desire to affiliate and enhance promotion-focused behaviors aimed at building a relationship. These results suggest indebtedness is also associated with positive outcomes and does not always have negative repercussions or lead to negative evaluations of the benefactors. Its association with gratitude could also mean people associate indebtedness with other positive implications. Future studies can explore this more extensively.

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Only indebtedness was associated with prevention focus (Mathews & Shook, 2013), which may increase our awareness of potential liabilities and obligations in a relationship. By adhering to the norm of reciprocity, people avoid negative evaluations by their benefactors and others. Maintaining the norm of reciprocity also signals to the benefactor that their actions have been acknowledged, and that when the need arises, they will receive similar support. On the whole, both gratitude and indebtedness are essential to ensure that relationships function well.

Tracking the Processes Underlying Gratitude, Indebtedness and Reciprocity in Daily Life

To date, there are many theories and supporting studies suggesting the importance of gratitude and indebtedness in motivating reciprocity. However, most studies have relied on vignettes, one-time scenarios, or recollection of single events (e.g. Bartlett & DeSteno, 2006; Tsang, 2006; Watkins et al., 2006). These studies also tend to focus on how these emotions facilitate reciprocity in strangers. In addition, with few exceptions (e.g., Bartlett et al., 2012; Algoe et al., 2008), many studies do not test the behavioral consequences of experiencing gratitude and indebtedness. Thus, it is fair to question whether the findings of this literature accurately reflect the role that gratitude and indebtedness play in everyday life.

The current study tested these effects in daily life through the use of a diary study. Both gratitude and indebtedness were with much more similar to each other than suggested by previous research. Perceived benevolence, cost and value uniquely predicted *both* gratitude and indebtedness and were mediated by perceived responsiveness. Thus there may be a set of common processes that influence both emotions. An important implication of this finding is that gratitude and indebtedness are likely to co-occur more often in daily life than suggested by scenario-based studies.

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Nevertheless, indebtedness but not gratitude, was uniquely associated with perceived expected repayment and the desire to adhere to the norm of reciprocity. These overall pattern of results are somewhat reflective of the results in the pilot study, where high levels of indebtedness are often associated with high levels of gratitude, but high levels of gratitude are not always associated with high levels of indebtedness. These similarities may partly explain why indebtedness is related to variables hypothesized as unique to gratitude, yet still maintains unique attributes.

In this study, I evaluated gratitude and indebtedness not only by their appraisals, but more importantly, by the *psychological process* by which these emotions affect reciprocity and other behavior. Gratitude has been found to increase one's desire to affiliate with their benefactors (Peng et al., 2017). The current study extends the effect of gratitude (as well as indebtedness) on the desire to affiliate to the amount of time spent with their benefactors when they received a favor. Indebtedness was found to increase reciprocity due to a greater desire to adhere to the norm of reciprocity.

This study also found that participants who felt more indebted towards their benefactors reported an increased likelihood of reciprocation. However, this effect was only found for delayed reciprocation, but not for immediate reciprocation. One possible explanation for this is that there could be a floor effect. Based on the number of cases reported, a total of 473 cases were 'reciprocated' at Phase 2. However, 674 cases were reported as 'reciprocated' in Phase 3. It could be that people need more time to reciprocate a favor (Phase 2 surveys were spaced two days apart, so any immediate reciprocation would have to occur within a 48-hour period). Hence, if there is a floor effect in immediate reciprocations, then there may not be enough variation to detect relations between immediate reciprocations with any variables. Despite only finding an effect for delayed reciprocation, this finding is noteworthy as it is based on events that we reported based on people's

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experiences in daily life. This helps to expand our knowledge of previous work, which focused mainly on using vignettes and experiments. Furthermore, most studies (e.g. Bartlett et al., 2006) focused primarily on gratitude and its effects on reciprocity. This study builds on past knowledge by looking at the effects of both gratitude and indebtedness on reciprocity. The results suggest that indebtedness may be more strongly associated with reciprocation as compared with gratitude. However the difference was not statistically significant and needs to be replicated in future research.

Another important insight from this diary study is that indebtedness is uniquely and positively associated with the desire to affiliate with the benefactor (H7). This challenges the idea that indebtedness leads to avoidance in relationships. Perhaps there is a difference in the indebtedness that is experienced in response to a hypothetical scenario or a single event recall that may lead participants to focus more on specific attributes of the event. For instance, participants may single out an event where they felt intense indebtedness towards their benefactor. Conversely, the experience of indebtedness in daily life might not necessarily lead to negative outcomes. However, this may depend on the culture of the sample. Events that elicit gratitude in East Asian cultures may also elicit indebtedness (Washizu & Naito, 2015). Indebtedness in such cultures could be a means to remind people to repay their benefactors, and allow them to maintain equal social exchange. It could also serve as an additional motivation to encourage us to affiliate more with our benefactors, and deepen our social relationships.

Limitations

One of the main limitations in the study was that it relied heavily on the recollections of the participants. Participants were asked to recall and describe the favor they received, if, how and when they reciprocated the favor. Around 30% of the cases reported by participants indicated that they were unable to recall the exact date the favor was reciprocated. In addition,

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there were inconsistent reports on whether they had reciprocated the favor. Around 25.6% of the cases were reported as ‘reciprocated’ in phase 2. However, these cases were reported as ‘not reciprocated’ in phase 3. Future studies can try to reduce the memory error by requesting for more information during the diary surveys. In particular, the survey design could incorporate some items to gather information if the favor had been reciprocated immediately. The shorter the amount of time between the actual event and the recollection, the more likely participant would be able to recall more details with greater accuracy.

Another limitation in the study was the inability to estimate random effects for indebtedness. In preliminary multilevel analyses, there was a lack of variation in the effect of indebtedness on other variables. As such, we could not estimate the random effects of indebtedness and other variables in this study. To account for this limitation, I used a Generalized Estimating Equation (GEE) model to analyze the data. This model accounts for the nesting effects of the multi-level model, and adjusts for these effects by adjusting the final beta value (McNeish et al., 2017). However, as random effect reflect how much the relation between the predictor and the outcome differs from the fixed effect estimate from person to person, it is important to accurately estimate it and better understand how and why the effects of gratitude and indebtedness vary across persons. Hence, future studies can try to increase variation in the data by increasing the number of favors participants recall. The more events participants report, the higher the chance that there will be differences in the types of events reported. This in turn would lead to greater variation in the data, making it easier to estimate the random effects.

Next, it is necessary to acknowledge that the tests of mediation were based on cross-sectional data (i.e., variables were collected in the same diary survey). It is possible that the causal direction differs from those hypothesized. For example, although perceived responsiveness mediated the effects of benefit appraisals on gratitude (H1 and H3), it is also

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plausible that a more responsive favor leads to perceptions of greater benevolence and costs. I tested these alternate models and found that the alternate pathways were indeed statistically significant. The relation between perceived responsiveness and gratitude could be mediated by perceived benevolence (95% CI [.098; .188] and perceived cost (95% CI [.002; .026]). Although both alternate models are statistically significant, they seem inconsistent with responsiveness literature. Responsiveness is an assessment of how well our relational partners respond to our needs and emotions (Canevallo & Crocker, 2010). We assess how responsive our partners are by observing their actions, and in turn infer how much their actions relate to our needs. Very often, we observe how much time, cost and effort (perceived cost) our partners invest, and how much they care for us (perceived benevolence). These observations, may inform our judgment of how responsive our partners are towards our needs. Nevertheless, future studies can attempt to manipulate either perceived benevolence and perceived cost, or perceived responsiveness to determine causality.

Similarly, although desire to affiliate mediated the effect of gratitude on motivation to reciprocate (H5), the motivation to reciprocate could intensify the desire to affiliate with a benefactor. I tested this model and founds that the indirect effect of this alternate model was also significant (95% CI [.016; .094]²; 95% CI [.120; .245]³). Although this model is statistically significant, the model is somewhat inconsistent with research on gratitude's role in relationship building. Other than a desire to affiliate, gratitude is also associated with an increased positive perception of the benefactor. Benefactors are also deemed as more supportive (Kong et al., 2014), warm (Williams & Bartlett, 2014) and responsive (Algoe et al., 2008). Being warm, supportive and responsive are all trademarks of good friends (Oswald, Clark, & Kelly, 2004). These effects may persist even after a favor has been reciprocated (in which case the motivation to reciprocate might be reduced).

² This model was conducted for favors that had already been reciprocated

³ This model was conducted for favors that have not been reciprocated

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Another possible limitation in this study was how similar both gratitude and indebtedness were in their relation to benefit appraisals and affiliative tendencies. This similarity could mean that people are unable to differentiate between both emotions. However, I do not feel this is the case. Results in the pilot study suggest that when people recall an event they feel indebted, they were also more likely to experience gratitude. However, when people recall a grateful event, they were not as likely to feel indebted. These results suggest that people associate indebtedness with gratitude, but not vice versa. Perhaps future studies can try to elicit a purer version of indebtedness, by using its unique attributes - perceived expected repayment and the desire to adhere to the norm of reciprocity - as manipulations. Using these distinct attributes might bring a greater focus onto indebtedness and allow people to differentiate more between both emotions.

Future Directions

The results of the current study suggest how different benefit appraisals can influence both gratitude and indebtedness. However, something that has yet to be tested in the field is how the different benefit appraisals interact to influence the intensity of gratitude and indebtedness people experience. From the pilot study, results suggest that people usually experience gratitude when they recall an event in which they felt indebted. However, people do not always experience indebtedness when they recall a grateful event. It seems plausible that there could be specific combinations of appraisals whereby people experience either emotion more strongly than the other, or even the absence of either of the emotion. More theoretical work is needed to identify additional appraisals or combinations of appraisals that may distinguish gratitude and indebtedness.

Another potential future direction could be how different intensities of gratitude and indebtedness influence later motivations. In this study, it seems that gratitude is strongly associated with future affiliative motivations and behaviors. On the other hand, indebtedness

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is associated with both affiliative motives and adhering to the norm of reciprocity. I proposed that both gratitude and indebtedness can work in tandem to maintain social exchanges and build relationships. However, if indebtedness is experienced too intensely, it might overwhelm the receiver with the obligation to reciprocate. In turn, this may reduce the potential positive effects that indebtedness may have in social exchange and relationships. It would be interesting to explore the intensities of both emotions, and find the optimum point where indebtedness overwhelms the effects of gratitude.

Finally, another potential future direction would be how people experience gratitude and indebtedness in different relationships (e.g. amongst friends, family, romantic partners). People may be more likely to overlook the benefits provided by extremely close relationships (e.g. parents, romantic partners), and pay more attention to the benefits provided by more distant relationships (e.g. acquaintances). It would be interesting to explore how people experience both emotions in different relationships, and how this relates to their eventual motivations and behaviors.

Both gratitude and indebtedness seem to be more similar than expected. Both emotions are triggered through similar actions, and it is possible to experience both emotions concurrently. Both emotions were found to be elicited through similar appraisals – perceived benevolence, cost and value – and were uniquely associated with the desire to affiliate and affiliative behavior. There are also distinct differences between the two emotions. Only indebtedness was elicited by perceived expected repayment. Furthermore, indebtedness was uniquely associated with the desire to adhere to the norm of reciprocity and likelihood of reciprocating a favor. These results suggest that although gratitude and indebtedness are positive and negative emotions respectively, they share many similarities when we experience them on a daily basis. I believe that this paper can act as a good starting point to

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identify more similarities and differences between both gratitude and indebtedness, and how people experience both emotions on a daily basis.

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Table 1

Mean comparisons of emotion and benefit appraisals in gratitude versus indebtedness experiences

| Emotional Experience | Gratitude | | Indebtedness | | t-test Value | Cohen's <i>d</i> |
|------------------------------------|-----------|------|--------------|-------|--------------|------------------|
| | M | SD | M | SD | | |
| Gratitude | 4.56 | .602 | 4.60 | .595 | -.542 | .067 |
| Indebtedness | 3.38 | .911 | 4.05 | 1.195 | -4.463* | .631 |
| Benefit Appraisals | | | | | | |
| Perceived Benevolence | 4.23 | .818 | 4.30 | .767 | -.591 | .088 |
| Perceived Expectation of Repayment | 2.86 | .996 | 3.18 | 1.044 | -2.170* | .314 |
| Perceived Cost | 4.27 | .675 | 4.28 | .756 | -.144 | .014 |
| Perceived Value | 4.33 | .699 | 4.42 | .638 | -.925 | .134 |

Note: sample size is 198. * signifies $p \leq .05$.

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Table 2

Correlation analyses between gratitude, indebtedness and benefit appraisals for pilot study

| Variables | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-------|-------|-------|------|-------|---|
| 1. Gratitude | - | - | - | - | - | - |
| 2. Indebtedness | .198* | - | - | - | - | - |
| 3. Perceived Benevolence | .483* | .123 | - | - | - | - |
| 4. Perceived Expected Repayment | .055 | .546* | -.105 | - | - | - |
| 5. Perceived Cost | .530* | .249* | .458* | .063 | - | - |
| 6. Perceived Value | .583* | .201* | .347* | .074 | .563* | - |

Note: sample size is 198. * signifies $p < .05$.

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Table 3

Correlation analyses between gratitude, indebtedness and diary-level variables for main study

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|-------|--------|--------|--------|-------|-------|--------|--------|-------|
| 1. Gratitude | - | - | - | - | - | - | - | - | - |
| 2. Indebtedness | .358* | - | - | - | - | - | - | - | - |
| 3. Perceived Benevolence | .389* | .293* | - | - | - | - | - | - | - |
| 4. Perceived Expected Repayment | -.021 | .131* | -.112* | - | - | - | - | - | - |
| 5. Perceived Cost | .202* | .278* | .197* | .163* | - | - | - | - | - |
| 6. Perceived Value | .508* | .337* | .505* | .006 | .321* | - | - | - | - |
| 7. Desire to Affiliate | .325* | .290* | .479* | -.035 | .256* | .373* | - | - | - |
| 8. Desire to Adhere to the Norm of Reciprocity | .206* | .484* | .230* | .189* | .239* | .228* | .296* | - | - |
| 9. Perceived Responsiveness | .389* | .310* | .600* | .007 | .263* | .637* | .435* | .220* | - |
| 10. Immediate Reciprocity | -.026 | -.022 | -.037 | -.065* | -.006 | .002 | -.153* | -.078* | -.058 |
| 11. Delayed Reciprocity | -.004 | -.075* | -.088* | .027 | .031 | -.054 | -.180* | -.090* | -.082 |

Note: Diary-level N = 1252.

* $p < .05$.

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Table 4

Correlation analyses between level 1 and personality (level 2) variables for main study

| Variables | Grat | Indebt | PBen | PExpRep | PCost | PValue | DoAff | DoNorm | PResp |
|---------------------|-------|--------|-------|---------|-------|--------|-------|--------|-------|
| GQ-6 | .262* | .055 | .218* | -.223 | .071 | .187 | .220* | .187* | -.008 |
| IPIP Extraversion | .084 | .067 | .085 | .064 | .163* | .123 | .145* | .188* | .006 |
| IPIP Agreeableness | .330* | .246* | .241* | -.039 | .123 | .260* | .255* | .316* | .161* |
| SHS | .079 | .022 | -.021 | .037 | .080 | .054 | -.006 | -.010 | -.091 |
| SAAS Approach | .362* | .099 | .260* | -.040 | .192* | .272* | .291* | .344* | .071 |
| SAAS Avoidance | .198* | .040 | .173* | -.063 | .016 | .159* | .137 | .088 | .113 |
| Social Desirability | .136 | .112 | .104 | .016 | -.029 | .151* | .102 | .183* | .177* |

Note: sample size is 196. * signifies $p < .05$.

Numbers continue from table 3. Where Grat = Gratitude, Indebt = Indebtedness, PBen = Perceived Benevolence, PExpRep = Perceived Expected Repayment, PCost = Perceived Cost, PValue = Perceived Value, DoAff = Desire to Affiliate, DoNorm = Desire to Adhere to the Norm of Reciprocity, PResp = Perceived Responsiveness.

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APPENDICES

Main Study: Phase 1 Study Materials: Mini International Personality Item Pool

Instructions: Here are some phrases describing people's behaviors. Please use the rating scale below to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and rate your response on the scale. Scale (1 = *very inaccurate*; 5 = *very accurate*)

1. Am the life of the party (E)
2. Sympathize with others' feelings (A)
3. Have frequent mood swings (N)
4. Don't talk a lot (E)
5. Am not interested in other people's problems (A)
6. Am relaxed most of the time (N)
7. Talk to a lot of different people at parties (E)
8. Feel others' emotions (A)
9. Get upset easily (N)
10. Keep in the background (E)
11. Am not really interested in others (A)
12. Seldom feel blue (N)

Note: Items 4, 5, 6, 10, 11 and 12 are reverse scored.

Source: From Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP scales: Tiny-yet-effective measures of the Big Five factors of personality. *Psychological Assessment, 18*, 192-203. Taken from <https://www.msu.edu/~lucasri/ipip.html>

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

Main Study: Phase 1 Study Materials: Gratitude Questionnaire 6

Instructions: Using the scale below as a guide, indicate how much you agree with each statement.

Scale: (1 = *strongly disagree*; 7 = *strongly agree*)

1. I have so much in 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. When I look at the world, I don't see much to be grateful for
4. I am grateful to 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

Note: Items 3 and 6 are reverse scored.

Source: McCullough, M. E., Emmons, R. A., & Tsang, J.-A. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology*, 82(1), 112-127.

Main Study: Phase 1 Study Materials: Social Approach and Avoidance Scale

(Elliot, Gable & Mapes, 2006)

Instructions: Using the scale below as a guide, indicate how much you agree with each statement.

Scale: (1 = *not true of me at all*; 7 = *very true of me*)

1. I try to deepen my relationship with others
2. I try to move toward growth and development in my relationships with others
3. I try to enhance the bonding and intimacy in my relationships with others
4. I try to share many fun and meaningful experiences in my relationships with others
5. I try to avoid disagreements and conflicts in my relationships with others
6. I try to stay away from situations that could harm my relationships with others
7. I try to avoid getting embarrassed, betrayed or hurt in my relationships with others
8. I try to make sure that nothing bad happens in my relationships with others

Source: Elliot, A. J., Gable, S. L., & Mapes, R. R. (2006). Approach and avoidance motivation in the social domain. *Personality and Social Psychology Bulletin*, 32(3), 379-391.

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

Main Study: Phase 1 Study Materials: Subjective Happiness Scale

For each of the following statements and/or questions, please rate the point on the scale that you feel is most appropriate is describing you.

1. In general, I consider myself:

| | | | | | | | | |
|-------------------------------|---|---|---|---|---|--|--|---------------------------|
| Not a very happy person | | | | | | | | A very happy person |
| 1 | 2 | 3 | 4 | 5 | 6 | | | 7 |

2. Compared with most of my peers, I consider myself:

| | | | | | | | | |
|------------|---|---|---|---|---|--|--|---------------|
| Less happy | | | | | | | | More happy |
| 1 | 2 | 3 | 4 | 5 | 6 | | | 7 |

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?

| | | | | | | | | |
|------------|---|---|---|---|---|--|--|-----------------|
| Not at all | | | | | | | | A great deal |
| 1 | 2 | 3 | 4 | 5 | 6 | | | 7 |

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?

| | | | | | | | | |
|------------|---|---|---|---|---|--|--|-----------------|
| Not at all | | | | | | | | A great deal |
| 1 | 2 | 3 | 4 | 5 | 6 | | | 7 |

Note: Item 4 is reversed scored.

Source: Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social indicators research*, 46(2), 137-155.

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

Main Study: Phase 1 Study Materials: Marlowe-Crowne Social Desirability Scale

Instructions: Using the scale below as a guide, indicate how much you agree with each statement.

Scale: (1 = *not true of me at all*; 7 = *very true of me*)

1. Before voting I thoroughly investigate the qualifications of all the candidates.
2. I never hesitate to go out of my way to help someone in trouble.
3. It is sometimes hard for me to go on with my work if I am not encouraged.
4. I have never intensely disliked anyone.
5. On occasion I have had doubts about my ability to succeed in life
6. I sometimes feel resentful when I don't get my way
7. I am always careful about my manner of dress
8. My table manners at home are as good as when I eat out in a restaurant
9. If I could get into a movie without paying and be sure I was not seen I would probably do it
10. On a few occasions, I have given up doing something because I thought too little of my ability
11. I like to gossip at times
12. There have been times when I felt like rebelling against people in authority even though I knew they were right.
13. No matter who I'm talking to, I'm always a good listener
14. I can remember "playing sick" to get out of something
15. There have been occasions when I took advantage of someone
16. I'm always willing to admit it when I make a mistake
17. I always try to practice what I preach
18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people
19. I sometimes try to get even rather than forgive and forget
20. When I don't know something I don't mind admitting it at all
21. I am always courteous, even to people who are disagreeable
22. At times I have really insisted on having things my own way
23. There have been occasions when I felt like smashing things
24. I would never think of letting someone else be punished for my wrong-doings
25. I never resent being asked to return a favor
26. I have never been irked when people expressed ideas very different from my own
27. I never make a long trip without checking the safety of my car
28. There have been times when I was quite jealous of the good fortune of others
29. I have almost never felt the urge to tell someone off
30. I am sometimes irritated by people who ask favors of me
31. I have never felt that I was punished without a cause
32. I sometimes think when people have a misfortune they only got what they deserved
33. I never deliberately said something that hurt someone's feelings

Source: Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne Social Desirability Scale. *Journal of clinical psychology*, 38(1), 119-125.

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

Main Study: Phase 2 Study Materials: Favor Recollection

Please recall something that someone did for you today. This could be a big favor or simply a small gesture; you may or may not have asked for a person for help. The main thing is that the person did something *for* you. Below, please describe what happened in as much detail as you can. You can include details such as what he (she) did for you, or how you felt about the event.

Note: This question was also used in the pilot study

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

Main Study: Phase 2 Study Materials: Gratitude Components

Please answer the following questions based the scenario you had just written:

[Show scenario here]

From your point of view, when performing this favor...

Scale: (1 = *not at all*; 5 = *a great deal*)

Emotional Reaction

1. How grateful did you feel towards X upon receiving this favor?
2. How indebted did you feel towards X upon receiving this favor?

Perceived Benevolence

3. X was concerned with your welfare
4. X's concern was truly genuine
5. X only wanted to help me and nothing else

Perceived Expectation of Repayment

6. X helped because he/she wanted something in return
7. X expects repayment for the favor
8. X helped because he/she expects something from me in return

Perceived Cost of the Favor

9. X exerted effort to help me
10. X invested time to help me
11. X incurred a cost to help me

Perceived Value

12. This favor was valuable to me
13. I benefited a lot from this favor

Perceived Responsiveness

14. X made me feel cared for
15. X was looking out for my best interests
16. X's help showed that he/she understood what I needed

Gratitude and Indebtedness

17. Did you ask X to help you with this favor? (Yes/ No)

Note: Items 1-13 are similar to items used in the pilot study

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

Main Study: Phase 2 Study Materials – Benefactor Assessment Survey

Please fill in the initials of the friend mentioned in the scenario: X

1. How long have you known X for? _____ years _____ months

2. What is X's gender? Male Female

3. How close are you to X?

| | | | | | | | |
|---------------------|---|---|---|---|---|---|--------------------|
| Not close at all | | | | | | | Extremely Close |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | |

4. How important is your relationship with X?

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

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

Main Study: Phase 2 Study Materials – Post-favor Motivation

Please answer the following questions based the scenario you had just written:

[Show scenario here]

Motivation to Reciprocate

Have you reciprocated for this favor (YES/NO)? Scale (0 = *not at all*; 5 = *a great deal*)

If YES,

How motivated were you to reciprocate?

If 0, why? (Open ended)

If No,

How motivated are you to reciprocate?

If 0, why? (Open ended)

Based on the following scale, how well does each statement reflect your reason for wanting to reciprocate the favor?

Scale: (1 = *not at all*; 5 = *a great deal*)

Desire to affiliate

1. I believe any future interactions with X will be pleasant.
2. I would like to spend more time with X
3. I would like to include X in social or recreational activities.
4. I would like to include X in things that I do

Desire to Adhere to the Norm of Reciprocity

5. I would feel uncomfortable if I didn't reciprocate
6. It's the right thing to do when somebody does you a favor
7. It wouldn't be fair if I didn't reciprocate
8. If I do not reciprocate, I would feel like I owe X
9. I feel committed to repay X for the favor.

General Prosocial Behavior

1. Over the past two days, how often have you helped others (excluding X)?

| | | | | | | |
|-----------------------------|-----------|-----------|-----------|-----------|------------|--------------------|
| Did not provide help at all | 1-2 times | 2-4 times | 4-6 times | 6-8 times | 8-10 times | More than 10 times |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

2. Over the past two days, how often have you offered to help others (excluding X)?

| | | | | | | |
|-----------------------------|-----------|-----------|-----------|-----------|------------|--------------------|
| Did not provide help at all | 1-2 times | 2-4 times | 4-6 times | 6-8 times | 8-10 times | More than 10 times |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

Main Study: Phase 3 Study Materials – Follow-up Survey

Below is a scenario of a favor that you had reported last week. Please respond the following questions based on the scenario written.

[Show scenario here]

1. Have you reciprocated the above favor? (Yes/No)

If Yes...

Please briefly describe what you did to reciprocate the favor? (Open Ended)

Please select the date you reciprocated the favor. (Drop down day and month)

Based on the following scale, how well does each statement how you feel about reciprocating the favor?

Scale: (1 = *not at all*; 5 = *very much*)

1. I have completely repaid X for the favor
2. I feel that what I did was enough to repay X for the favor
3. I feel I need to do more than what I have done to repay X
4. I feel that I helped X more than he/she helped me
5. I did more than necessary to repay X for the favor
6. I did the bare minimum to repay X for the favor

GRATITUDE, INDEBTEDNESS AND RECIPROCITY

Main Study: Phase 3 Study Materials – Affiliation with Benefactor

Please respond to the following items:

1. How much time did you spend interacting online with X for the past week? Online behaviors include messaging on whatsapp, telegram and other forms of chatting apps.

| | | | | | | |
|------------------|-----------|-----------|-----------|-----------|------------|--------------------|
| Less than 1 hour | 1-2 hours | 2-4 hours | 4-6 hours | 6-8 hours | 8-10 hours | More than 10 hours |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

2. How much time did you spend in the company of X for the past week?

| | | | | | | |
|---------------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------------|
| Less than 1 hour per week | 1-2 hours per week | 2-4 hours per week | 4-6 hours per week | 6-8 hours per week | 8-10 hours per week | More than 10 hours a week |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

3. How often did you initiate contact with X over the past week?

| | | | | | | |
|---------------------------------|-----------|-----------|-----------|-----------|------------|--------------------|
| Did not initiate contact at all | 1-2 times | 2-4 times | 4-6 times | 6-8 times | 8-10 times | More than 10 times |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

4. How often have you provided X help over the past week?

| | | | | | | |
|-----------------------------|-----------|-----------|-----------|-----------|------------|--------------------|
| Did not provide help at all | 1-2 times | 2-4 times | 4-6 times | 6-8 times | 8-10 times | More than 10 times |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |