

Willingness to Express Gratitude: The Role of Self-Regulation and Self-Focus

by

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Biographical Sketch

Stephanie D. O’Keefe was born in San Diego, California. She attended the University of California Santa Barbara from 2006 to 2010, where she received a Bachelor of Arts Degree in Psychology with high honors and distinction in the major. She began her doctoral studies in Social-Personality Psychology under the supervision of Harry T. Reis at the University of Rochester in 2010. She received her Master of Arts Degree in Social-Personality Psychology at the University of Rochester in 2012.

The following publications were a result of work conducted during doctoral study:

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Abstract

The existing literature has established that both feeling grateful and expressing gratitude are associated with increases in well-being and relationship quality. Yet, many people indicate that they feel gratitude more frequently than they express it. The purpose of this research is to better understand why people are sometimes unwilling to express gratitude to others. More specifically, I anticipated that self-control would be associated with greater willingness to express gratitude and maladaptive forms of self-consciousness would be associated with less willingness to express gratitude. Study 1 examined whether self-control and self-consciousness were associated with willingness to express gratitude to a romantic partner. Study 2 examined whether self-control and self-consciousness influenced daily fluctuations in gratitude expression to close others. Study 3 sought to establish causality by examining the effect of self-regulatory depletion on behavioral gratitude expression in a laboratory setting. The current work reveals that having high self-control is associated with more gratitude expression and that having high social anxiety, a form of self-consciousness, is associated with less gratitude expression. However, contrary to predictions, self-control may not help people overcome individual differences that are associated with feeling and expressing low amount of gratitude. Instead, this work suggests that self-control promotes gratitude expression among individuals who are low in maladaptive self-consciousness and are already more inclined to express gratitude in the first place. One reason for this may be that individuals who are predisposed to feel and express less gratitude may not be motivated to utilize self-control to overcome their tendencies.

Contributors and Funding Sources

This work was supervised by a dissertation committee consisting of Professors Harry T. Reis (advisor) and Miron Zuckerman from the Department of Clinical and Social Sciences in Psychology, and Professor Kathi Heffner from the Department of Psychiatry. All work for the dissertation was completed independently by the student without outside funding support.

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Chapter 1: Introduction

Gratitude is the recognition and appreciation of good things in our lives, which are often favors others bestow onto us. From a colleague staying at work late to help you on a project, to your parents helping you move into your first apartment, to a friend driving you to the airport so you don't have to pay for a cab, there are many benefits others provide us that elicit gratitude. People think positively of the concept, as gratitude received top ratings when individuals are asked to rank how much they liked a variety of different adjectives (N. H. Anderson, 1968). Gratitude has also been empirically linked with happiness and a variety of well-being outcomes (McCullough, Emmons, & Tsang, 2002; Watkins, 2014; Watkins & Ola, 2001; Wood, Froh, & Geraghty, 2010; Wood, Joseph, & Maltby, 2008). A national survey conducted by the John Templeton Foundation demonstrated that feeling grateful is not rare, with 90% of individuals indicating they were grateful for their family, and 87% indicating they were grateful for their close friends. However, only 52% of women and 44% of men said they regularly expressed their appreciation (Kaplan, 2012). The same survey also revealed that people saw value in expressing gratitude to others, with 60% saying they express gratitude because it makes them feel good, and 57% saying they express gratitude because it makes others feel good. Feeling grateful is commonplace, and most of us say we are deeply thankful for our loved one when asked directly, but expression is infrequent in comparison.

The goal of this research is to increase our understanding of the mechanisms behind gratitude expression, specifically by identifying factors that reduce the willingness

to express gratitude. Imagine you are running late for work and a stranger holds a door open for you. Do you thank him in the moment? Alternatively, imagine you have a tough, but fair, high school teacher. What you learned from her class deeply influenced your life, but you feel intimidated by her. Are you willing to tell her how much she impacted your life? Sometimes we feel thankful for kind gestures, ranging from a stranger holding the door open on a stressful and rushed morning, to an influential role model who we learned a great deal from, but we do not directly express our appreciation to the other person. We might be distracted or feel uncomfortable sharing such intimate feelings. One factor that is associated with such discomfort is self-consciousness, which is a general tendency toward self-directed attention (E. M. Anderson, Bohon, & Berrigan, 1996; Fenigstein, Scheier, & Buss, 1975; Leary, Adams, & Tate, 2010). There are different forms of self-consciousness, which will be discussed later in this proposal, some of which are characterized by negative rumination and worrying about how others perceive them. These concerns may result in self-conscious individuals feeling awkward, uncomfortable, and ultimately less willing to express gratitude because they are worried how the other person will react. Being self-focused, instead of other focused, is also associated with feeling more indebted than grateful (Mathews & Green, 2010), which may also decrease willingness to express gratitude. Though gratitude is a positive emotion that promotes well-being, the social sharing of appreciation with benefactors requires time and extra effort to override tendencies toward self-focus that direct the beneficiary's attention away from the good deeds of the benefactor.

If gratitude expression is an effortful task, self-regulation is one factor that may be associated with how willing people are to express their appreciation to others. Positive relationship processes, like relationship maintenance, also require effort to successfully enact (Rusbult, Olsen, Davis, & Hannon, 2004). In this proposal, I suggest that gratitude expression is also a positive relationship process, and will require effort in a way that is similar to other relationship maintenance mechanisms. It is also likely that feeling grateful does not require the same level of effort as expressing gratitude to others. This distinction may explain the differences in self-reported feelings of gratitude and gratitude expression that emerged in the John Templeton Foundation survey. Therefore, I also propose that individuals who have low levels of trait self-control, as well as individuals who are depleted of self-regulatory resources, may be less willing to express appreciation. Finally, I propose that the role of self-regulation in gratitude expression will be to redirect attention from the self to the other, making this process most beneficial for highly self-conscious individuals, who tend to experience more indebtedness than gratitude when they are helped by others (Mathews & Green, 2010).

What is gratitude?

Gratitude is a concept that most people are familiar with, as it has a rich and pervasive history with moral underpinnings. Many monotheistic religions, from Judaism to Christianity to Islam, mention gratitude as a virtue to live by (Carman & Streng, 1989). These religious teachings advocate that living the good life involves the development of gratitude, specifically to God. One example from The Bible says “This is the day that the Lord has made; let us rejoice and be glad in it.” [Psalm 118:24] However, when

considering research operationalization of gratitude, the concept evades consistent definition. Gratitude has been defined as a moral sentiment, a virtue, a motive, a skill, a personality trait, a habit, a coping response, an emotion, and an attitude (Emmons & Crumpler, 2000; Emmons, McCullough, & Tsang, 2003; Lambert, Graham, & Fincham, 2009). In the proposed research, I will define gratitude as an emotion that can be expressed to others, emphasizing the interpersonal aspects of the construct. However, the various aforementioned definitions of gratitude contribute to illustrating lay conceptions of gratitude and its underlying mechanisms. Clarifying these various conceptual definitions is essential in understanding how gratitude functions and how it contributes to well-being.

The emotional experience of gratitude involves feeling appreciative in response to receiving a benefit that requires some level of sacrifice or cannot be repaid (Emmons & Crumpler, 2000). The intention of the giver also matters, with individuals feeling grateful when they perceive the benefactor was purposefully helpful and kind. McCullough and colleagues proposed that gratitude plays three mechanistic roles (McCullough, Kilpatrick, Emmons, & Larson, 2001). First, gratitude is a *moral barometer*, as it induces feelings of appreciation that highlight favors and benefits provided others have provided us (McCullough et al., 2001). This awareness then leads to gratitude serving as a *moral motive* that specifically motivates a grateful person to engage in prosocial behaviors (McCullough et al., 2001). Finally, gratitude is a *moral reinforcer*, since the positive feelings of appreciation that result from being the recipient of prosocial behavior leads to

future prosocial behavior, perpetuating a cycle of reciprocal altruism (McCullough et al., 2001; Trivers, 1971).

Gratitude can also be considered as a personality trait, in which people are characterized as being grateful or ungrateful. A grateful person feels and expresses gratitude consistently and appropriately, and is considered an individual of good character. In contrast, an ungrateful person reacts to the benevolence of others with indifference, resentment, or hostility, and is considered an individual of poor character (Emmons & Crumpler, 2000). Some consider gratitude to be a moral obligation, meaning that we owe it to those who are generous to us and it is our duty to express this to others (Emmons & Crumpler, 2000; Schimmel, 1997). Other researchers have described gratitude as one of mankind's strengths, as it enhances personal and interpersonal well-being and the well-being of society as a whole (Emmons & Crumpler, 2000; Emmons et al., 2003). All together, these definitions indicate that people hold grateful individuals in high-esteem, and feel negative toward ungrateful individuals. When we perceive someone to be appreciative, we are likely to make positive attributions about the individual, which, in turn, can result in increased liking.

The way people express feelings of gratitude has been examined in two different ways. Gratitude intervention research has used the term "gratitude expression" to refer to expressive writing, in which individuals listed things in their lives for which they were grateful (Emmons & McCullough, 2003; Sheldon & Lyubomirsky, 2006). Rather than referring to an interpersonal exchange, this definition conceptualizes gratitude expression as an intrapersonal reflection on feelings of appreciation for the good things in one's life.

However, most research on gratitude expression defines it as an interpersonal exchange in which one expresses appreciation to a benefactor (Lambert, Clark, Durtschi, Fincham, & Graham, 2010; Seligman, Steen, Park, & Peterson, 2005; Wood et al., 2010). This definition of gratitude expression will be the primary focus of my proposal. In measuring gratitude expression, some paradigms hinge on thanking another person for a specific favor or benefit (Moss & Page, 1972; Seligman et al., 2005), while others measure gratitude more broadly, by including thanking others for specific benefits, as well as thanking others simply for their presence in one's life (Algoe, Fredrickson, & Gable, 2013; C. L. Gordon, Arnette, & Smith, 2011; Lambert et al., 2010; Lambert & Fincham, 2011). These differences in measurement specificity bring to light the issue of inconsistent definitions of gratitude.

In addition to the inconsistency in gratitude research definitions, another issue in the gratitude literature is that there is often a mismatch in conceptual definitions and measures used, typically with research definitions being narrowly focused and gratitude measures that tap into generalized features (Lambert, Graham, et al., 2009). Lambert and colleagues sought to more precisely define gratitude, with the hope that a more precise research definition would facilitate more refined measures and paradigms. These researchers distilled the wide variety of gratitude conceptualizations into narrower definitions, and distinguished benefit-triggered gratitude from broader definitions, such as general feelings of thankfulness and appreciation (Lambert, Graham, et al., 2009). Benefit-triggered gratitude is one's response to a specific interpersonal exchange (Emmons, 2004; Lambert, Graham, et al., 2009), and includes things like feeling

appreciative when your romantic partner cooks you dinner on a night you get home from work late. Alternatively, generalized gratitude is feeling appreciative for things that are valuable and meaningful to the self (Adler & Fagley, 2005; Lambert, Graham, et al., 2009), and includes things like feeling grateful for your parents' presence in your life or for warm weather after a long cold winter. In order to reconcile these two levels of specificity, Lambert and colleagues tested whether gratitude had a prototypical structure (2009). If a concept is understood prototypically, people will be able to identify defining features and rate their centrality reliability, and these central features will influence how people think about the concept (Rosch, 1975, as cited in Lambert et al., 2009). The researchers found support for a prototype structure of gratitude, which is similar to other emotions (Lambert, Graham, et al., 2009). However, they also found that laypersons' understanding of gratitude is more complex than most research definitions, since it includes both benefit-triggered gratitude and generalized gratitude. Knowing that people understand gratitude as a complex construct can help researchers define gratitude in a way that has ecological validity. However, Lambert and colleagues advise that it is still beneficial to continue using narrow definitions of gratitude, which focus on either benefit-triggered gratitude or generalized feelings of gratitude, so we can determine whether or not these two different conceptualizations of gratitude influence well-being and social relationships in the same way (2009).

The research I am proposing will explore the interpersonal aspects of gratitude, specifically focusing on what makes people unwilling to express gratitude to benefactors. This research will contribute to expanding what is becoming a rich area of social

psychology that investigates the underpinnings and benefits of gratitude as an interpersonal process. In examining unwillingness to express gratitude, the benefit-triggered definition fits best conceptually. The present research will focus not only on specific benefits, but also on gratitude directed toward specific individuals. That is to say, rather than examining gratitude as a generalized feeling, I will examine gratitude as an interpersonal process, in which the emotion is felt and expressed in response to benefits given to the self by other people.

Gratitude Emotion

Emotions are short-term reactions that signal to the individual their current position in the environment (Barrett, 2006), which result in biological, cognitive, and behavioral synchronization (Keltner & Gross, 1999) that correspond with the situational cues. More specifically, emotions indicate to the individual whether the environment is threatening or safe to explore (Fredrickson, 1998), which helps people update their goals and motives accordingly (Algoe, Gable, & Maisel, 2010; Baumeister, Vohs, DeWall, & Zhang, 2007; Schwarz & Clore, 2007). One specific context in which emotions guide physiology, cognition, and behavior is social interactions and relationships (Algoe et al., 2010; Keltner & Buswell, 1997). When considering gratitude as an emotion, I will focus specifically on how gratitude influences cognitions and behavior in interpersonal contexts.

Gratitude is a positively valenced emotion (Lazarus & Lazarus, 1994) that elicits action-tendencies, typically in the form of positive social behaviors (Watkins, 2014). Some argue that gratitude is dependent on attributions and has two cognitive steps: first,

people recognize that they have gained something positive and second people recognize that their positive gain was obtained from an external source (Emmons & McCullough, 2003; Weiner, 1985). Gratitude has also been categorized as an “other-praising” emotion, in which the definition focuses on recognition of specific incidents in which another person intentionally does something helpful for oneself (Algoe & Haidt, 2009; Weinstein, DeHaan, & Ryan, 2010). Feeling grateful is associated with increased desires to acknowledge the other person, which can range from saying “thank you” to giving the person a hug, as well as increased desire to repay or reward the benefactor (Algoe & Haidt, 2009). People also experience more gratitude when the helpful action is something they like or value (Algoe, Haidt, & Gable, 2008; Tesser, Gatewood, & Driver, 1968; Tsang, 2007). In other words, gratitude is enhanced when the recipient perceives that the benefactor’s actions were responsive to their needs (Algoe et al., 2010, 2008; Kubacka, Finkenauer, Rusbult, & Keijsers, 2011).

Early work examining gratitude as an emotion suggests that it is a moral affect, which serves to highlight when others do good unto us and promote prosocial behavior as a result (McCullough et al., 2001). For instance, in one study where gratitude was experimentally induced, participants were more willing to help the benefactor, even when provided help resulted in personal costs. When gratitude was induced, participants were more likely to help the confederate benefactor with a tedious task, and more likely to give more resources in an economic game, even when sharing resources in this context had negative consequences for the self (Bartlett & DeSteno, 2006; Tsang, 2006a). In another study where gratitude was experimentally induced, individuals were more likely to try

and include the benefactor when they perceived the benefactor was being socially excluded in a game of cyber-ball. The researchers suggested that this was evidence of gratitude-promoting affiliation with individuals who provide help or benefits to us. Further support that gratitude promotes pro-relationship behaviors beyond direct reciprocation is provided by Watkins and colleagues (2006). Participants who read a hypothetical vignette that primed gratitude anticipation were more likely to endorse a wide range of prosocial motivations toward the benefactor, including approaching, adoring, and deferring to the person who would hypothetically provide them a benefit (Watkins, Scheer, Ovnicek, & Kolts, 2006).

Self-focus as a predictor of gratitude or indebtedness

It is possible that people are less willing to express gratitude when they feel indebted to someone after receiving a benefit. Though gratitude and indebtedness were not always differentiated in the literature (Komter, 2004; Tesser et al., 1968), empirical evidence has accumulated supporting the assertion these two emotions are distinct from one another (Goei & Boster, 2005; Mathews & Green, 2010; Tsang, 2006b; Watkins et al., 2006). It is important to differentiate the positive feelings of gratitude from negative feelings of indebtedness, since both emotions can be elicited by the same situation, the receipt of costly benefits that were intentionally provided by another (Algoe et al., 2010, 2008; Bartlett & DeSteno, 2006; Tsang, 2006b). Additionally, both gratitude and indebtedness are associated with the desire to repay the benefactor, as reciprocating a favor is a socially desirable and expected response (Algoe et al., 2010; Gouldner, 1960; Greenberg & Shapiro, 1971). However, gratitude and indebtedness tend to be negatively

correlated (Mathews & Green, 2010; Watkins et al., 2006), because the experience of gratitude involves a positive awareness of the good others have done for oneself, while indebtedness the negative experience of feeling that one has burdened the benefactor. Feeling indebted is even more likely when one perceives that the benefactor expects a reciprocal behavior in return, as well as when one perceives that the benefactor has ulterior motives (Watkins et al., 2006). In sum, feeling grateful tends to be other-focused, with an emphasis on feeling appreciative for magnanimous care provided by others, while feelings of indebtedness tend to be self-focused, with an emphasis on owing the benefactor a reciprocal favor (Algoe et al., 2010).

To support the self and other focus distinction between indebtedness and gratitude, respectively, self-consciousness, a measure of dispositional tendencies toward self-focus, has been established as an indicator of whether someone is going to feel grateful or indebted in response to favors others provide (Mathews & Green, 2010). Self-consciousness is conceptualized using three different factors: Private self-consciousness, public self-consciousness, and social anxiety. Private self-consciousness is a form of self-focus in which people attend to their inner thoughts and feelings, while public self-consciousness is when people focus on aspects of themselves that others can observe (Fenigstein et al., 1975). Social anxiety is described as a reaction to either of the aforementioned self-focused states, and is the experience of discomfort in social situations (Fenigstein et al., 1975). Additionally, two different forms of private self-consciousness have also been established: self-reflectiveness (SR) and internal state awareness (ISA; E. M. Anderson et al., 1996). SR is considered a negative ruminative

form of self-focus, and is significantly associated with neuroticism, anxiety, shame, guilt, and low agreeableness (E. M. Anderson et al., 1996; Conway & Giannopoulos, 1993; Scandell, 2001; Trapnell & Campbell, 1999). In contrast, ISA is a balanced form of self-awareness, in which people are non-evaluative and present-oriented (E. M. Anderson et al., 1996).

Mathews and Green found that gratitude was negatively correlated with public self-consciousness and social anxiety, was positively correlated with ISA, and was uncorrelated with SR private self-consciousness (2010). On the other hand, they found that indebtedness was positively correlated public self-consciousness, social anxiety, and SR private self-consciousness, and was uncorrelated with ISA (Mathews & Green, 2010). These findings suggest that most forms of self-consciousness are associated with more negative experiences, with ISA being the exception. To follow up the correlational findings, public self-consciousness and social anxiety were included simultaneously as predictors of gratitude in a regression model. Social anxiety was a significant predictor of lower feelings of gratitude, but public self-consciousness did not reach significance, suggesting that social anxiety was the strongest predictor of feeling less gratitude.

The causal effect of self-focus was also examined in an experiment, in which participants wrote about the most recent favor or gift they received, and were asked how close and committed they felt to the benefactor, and how significant the favor or gift was (Mathews & Green, 2010). Self-focus was manipulated with the mirror paradigm (Reis & Burns, 1982), with participants writing about their most recent gratitude experience while facing a mirror, which induces self-focus, or facing a blank panel. Participants who were

facing a mirror reported feeling more indebtedness, but there was not a significant effect on gratitude (Mathews & Green, 2010). Additionally, participants in the self-focus condition reported feeling less close and less committed to the benefactor, suggesting that higher self-focus is associated with changes in how one thinks about the benefactor (Mathews & Green, 2010).

Another key difference between gratitude and indebtedness is that the two experiences are associated with different action tendencies (Watkins et al., 2006). Gratitude is associated with prosocial action tendencies, both in terms of reciprocal altruism and desires to increase social connection with the benefactor (Watkins et al., 2006). For example, grateful individuals were likely to feel like approaching their friend, expressing happiness to their friend, and helping their friend (Watkins et al., 2006). Alternatively, indebtedness is not associated with the same upward spiral of prosocial behavior, but was not associated with avoidance behaviors either (Watkins et al., 2006). In sum, gratitude is associated with positive social action, while indebtedness is not associated with positive or negative social action tendencies.

When it comes to expressing feelings of gratitude and indebtedness, Kotani suggests that there are cultural differences in how much people differentiate the two emotions (2002). Japanese speakers use the expression “I’m sorry” to convey both gratitude and indebtedness, as it acknowledges the suffering and discrepancy associated with the costs one incurs when providing help or favors (Kotani, 2002). However, English speakers do not use the expression in this way, and “I’m sorry” is reserved for admitting responsibility for a negative event or transgression (Kotani, 2002). In my

research, I will use a definition of gratitude expression that corresponds with Western understanding of the term, in which the emphasis of the experience and expression of gratitude is positive.

Gratitude Expression

Early research on interpersonal gratitude expression utilized a “gratitude visit” paradigm, in which individuals were asked to write a letter thanking someone for a recent gift and to read the letter to the benefactor in-person (Seligman et al., 2005; Wood et al., 2010). Compared to participants in the placebo control condition, those who went on a “gratitude visit” reported more happiness and less depression immediately after gratitude expression, as well as one month later (Seligman et al., 2005; Wood et al., 2010). Recent research on the effects of interpersonal gratitude expression found that when participants wrote a gratitude letter to someone who was kind to them they experienced higher state humility, or having decreased self-focus and a secure sense of self (Kruse, Chancellor, Ruberton, & Lyubomirsky, 2014). In a daily diary study, they also found that gratitude and humility predicted one another, even when controlling for gratitude or humility ratings from the previous day (Kruse et al., 2014). These findings provide support for the conceptual parallel of humility and gratitude, which is an increased awareness and focus on others.

Interpersonal gratitude expression has also been linked to prosocial behavior. In one study a confederate asked the participant for directions and either thanked them for their help, or said nothing (Moss & Page, 1972). Participants who were thanked for their help were more likely to help someone who dropped their books, compared to individuals

who were not thanked (Moss & Page, 1972). In another study, participants who were thanked by a confederate were more likely to endure a greater number of shocks to benefit the confederate (McGovern, Ditzian, & Taylor, 1975). Grant and Gino (2010) further investigate the link between interpersonal gratitude expression and prosocial behavior. In a series of studies, they find that individuals who were thanked for their help in the lab were significantly more likely to edit more cover letters for the experimenter, make more phone calls for a fundraiser. The association between gratitude expression and helping behavior was mediated by increased feelings of social worth, a communal mechanism (Grant & Gino, 2010). Being the recipient of gratitude expression makes people feel valued and cared for, which elicits further altruistic behavior.

However, gratitude expression is not always well received. The motivation behind both helpful acts and gratitude expression influences whether people perceive the expression as genuine. If gratitude-expression recipients believe the person thanking them is seeking additional favors, these ulterior motives reduce the likelihood of subsequent prosocial behavior. In one study, a jewelry store called their customers to either thank them for their purchase, or to thank them for their purchase and inform them of an upcoming sale (Carey, Clique, Leighton, & Milton, 1976). Customers who were simply thanked ended up spending significantly more money at the jewelry shop in the upcoming months (Carey et al., 1976). In contrast, those who were thanked and informed about the upcoming sale did not spend more money at the store, as the gratitude expression was interpreted as an attempt to increase sales (Carey et al., 1976).

Another context in which suspecting ulterior motives hinders the prosocial cycle of gratitude is observed when there are differences in social power (Inesi, Gruenfeld, & Galinsky, 2012). For instance, high power individuals, in the context of social hierarchies and interpersonal relationship dynamics, are more likely to make cynical attributions when another person provides them a favor (Inesi et al., 2012). As a result of such suspicion, high power individuals felt less thankful, had less desire to reciprocate prosocial behavior, and had lower trust of the person who provided them a favor (Inesi et al., 2012). These two studies demonstrate the critical role perceived motives have on experiencing gratitude.

Gratitude in Close Relationships – Emotion

The gratitude research that has been discussed thus far varies drastically in terms of relationship context. Many of the previous studies do not discuss the relationship context in great detail, or they examine gratitude in relationships low in intimacy, such as gratitude among acquaintances, salespeople, and experimenters. Some researchers have suggested that gratitude is not a useful emotion in romantic relationships, because individuals in these relationships provide benefits to each other often (McCullough, Kimeldorf, & Cohen, 2008). However, ample contradictory evidence has accumulated, thereby establishing the importance of gratitude in both new and well-established relationships. Gratitude also has conceptual overlap with main theoretical ideas in the close relationships literature. For example, gratitude requires a willingness to remain indebted and acknowledge dependency on another person (Emmons & Crumpler, 2000), which dovetails with the construct of commitment (Rusbult, 1980; Rusbult, Martz, &

Agnew, 1998). Additionally, repaying a debt too quickly or too literally is considered inappropriate (Emmons & Crumpler, 2000), which corresponds with the communal strength model (Clark & Mills, 1979; Clark & Mills, 1993).

First, gratitude has positive influences during early stages of relationships, because people have positive stereotypes about grateful individuals (McCullough et al., 2002; Watkins, 2014). While gratitude as a personality trait produces positive stereotypes, experiencing gratitude in response to favors also promotes relationship development. Algoe and colleagues (2008) extended gratitude beyond a reciprocal laboratory setting by examining gratitude in a naturalistic setting. During the first week of the school year, the researchers examined a sorority tradition in which older members anonymously shower new members with gifts. At the end of this week, the gift givers' identities were revealed. Perceived responsiveness, which is how much the gift recipient felt understood, cared for, and validated by the gift giver, was also considered. Conceivably, one will experience more gratitude if they feel the gift giver is responsive. This idea was supported, and perceived responsiveness predicted gratitude, which resulted in high-quality relationships between the gift giver and recipient one month later (Algoe et al., 2008). The effects of responsiveness on feeling grateful still held when accounting for how much the person liked the gift and how much the person believed the gift cost, in terms of monetary value and effort (Algoe et al., 2008). This provides support that perceived responsiveness assists in promoting feelings of appreciation that fuel feeling closer to the benefactor.

While gratitude is beneficial during the relationship formation stage, the majority of interpersonal relationship research on gratitude examines how it functions in committed relationships. In the context of well-established relationships, gratitude plays a role in perpetuating relationship maintenance. Feeling grateful for a relationship partner engenders mutually responsive behaviors and increases the likelihood of a multitude of different behaviors that help relationships thrive (A. M. Gordon, Impett, Kogan, Oveis, & Keltner, 2012; Kubacka et al., 2011; Lambert & Fincham, 2011). For example, trait gratitude is associated with a greater willingness to forgive (Neto, 2007), which is a behavioral relationship maintenance mechanism that promotes commitment and relationship well-being (Rusbult, Olsen, Davis, & Hannon, 2001). Self-reported appreciation toward one's partner is also associated with relationship maintenance. Kubacka and colleagues (2011) identified gratitude as both a motivator and signal of relationship maintenance, which dovetails with Emmons and colleagues' proposition that gratitude is a moral reinforcer. While gratitude as a moral reinforcer perpetuates prosocial behavior by illuminating benefits others have provided to the self, Kubacka and colleagues suggested that gratitude perpetuates relationship maintenance behavior by illuminating a romantic partner's responsiveness. More specifically, in a longitudinal study with newlywed couples, Kubacka and colleagues found that perceived responsiveness was associated with gratitude, and gratitude was in turn associated with relationship maintenance, which was then perceived by the other partner, continuing an upward spiral of positive relationship outcomes (2011).

Gordon and colleagues find similar dyadic effects supporting the role of gratitude as a stimulator of relationship maintenance behaviors that promotes an upward spiral of positive relationship outcomes. In a series of studies, the researchers find that people who are appreciative of their romantic partners also report feeling more appreciated by their partners (A. M. Gordon et al., 2012). As a result, individuals who appreciate their romantic partners are more responsive to their partner's needs, report being more committed in their relationship, and are less likely to break-up (A. M. Gordon et al., 2012). In dyadic laboratory interactions, outside observers who were blind to the research hypothesis were more likely to report that more appreciative individuals appeared more responsive and committed in these interactions (A. M. Gordon et al., 2012), indicating that gratitude noticeably influences the way people interact with their romantic partners. Utilizing the appreciation in relationships (AIR) scale that Gordon and colleagues developed, appreciation for one's romantic partner has been associated with higher investment in the romantic relationship (Joel, Gordon, Impett, Macdonald, & Keltner, 2013). Relationship investments are associated with higher levels of commitment (Goodfriend & Agnew, 2008; Rusbult, 1983), which has downstream effects on relationship maintenance behavior, as well as relationship satisfaction and well-being (Rusbult et al., 2001).

Gratitude is also associated with lower levels of social aggression, and this effect is mediated by empathy (DeWall, Lambert, Pond, Kashdan, & Fincham, 2012). This evidence supports Lazarus and Lazarus's (1994) classification of gratitude as an "empathic emotion," because a critical feature of gratitude is the ability to empathize with

others. DeWall and colleagues (2012) build on these initial findings and show that gratitude may play a role in inhibiting aggressive responses. Using an experimental design, the researchers find that when gratitude is induced, participants who are insulted by a confederate do not report experiencing aggression, and do not retaliate aggressively when given the chance to administer bursts of white noise to the insulting individual. Alternatively, in the control condition, provoked participants respond aggressively and administer more white noise bursts relative to individuals who were not insulted. This suggests that gratitude promotes relationship maintenance by reducing the likelihood of gratifying immediate self-interested needs and desires, such as by retaliating aggressively when provoked. One explanation for this process is that the experience of gratitude directs attention to prosocial and generous responses, resulting in decreased motivation to aggress. This can benefit relationships, as it may reduce the chance of deleterious conflict escalation.

Gratitude in Close Relationships – Expression

Most of these studies utilize measures that assess feelings of appreciation toward one's partner, rather than direct outward expressions of gratitude. While the association between feeling grateful for one's romantic partner and positive relationship outcomes is robust and has a rich supporting literature, there are fewer studies demonstrating similar relationship benefits associated with gratitude expression. Lambert and colleagues find that both grateful thoughts and self-reported gratitude expression were associated with increases in communal strength over time (Lambert et al., 2010). In a different study utilizing longitudinal methods, Lambert and Fincham (2011) find that self-reported

gratitude expression was associated with more comfort in voicing relationship concerns, which is one form of relationship maintenance.

Though self-reported gratitude expression is associated with relationship benefits, these studies do not examine the effects of gratitude expression on the recipient. Studies examining how gratitude expression affects both the expresser and recipient have yielded mixed results. In a 2-week daily diary study, Gordon and colleagues (2011) examined the effects of felt and expressed gratitude on marital satisfaction. They find that on days people feel and express gratitude to their romantic partner, they also have higher marital satisfaction. Dyadic analyses suggest that when people report feeling more gratitude their partner feels more satisfied in the relationship (C. L. Gordon et al., 2011). However, reports of expressing more gratitude had no influence on their romantic partner's daily relationship satisfaction (C. L. Gordon et al., 2011). One reason the authors provide for this unexpected null finding is that people may sometimes make negative attributions when their partner expresses gratitude (C. L. Gordon et al., 2011). Gordon and colleagues surmise that, for example, when one's romantic partner thanks them for washing the dishes, this expression of appreciation could be interpreted as manipulative, patronizing, or sarcastic (C. L. Gordon et al., 2011). Another explanation the authors provide is that in long term relationships gratitude expression may become habitual and go unnoticed by one's partner (C. L. Gordon et al., 2011).

Gratitude expression is likely most beneficial when a romantic partner perceives it as responsive and genuine. Algoe and colleagues found support for this claim (2013). In a laboratory setting, couples were asked to discuss something kind their partner did for

them recently and completed a follow-up questionnaire 6-9 months later where they rated their relationship satisfaction (Algoe et al., 2013). Perceiving a partner's expressed gratitude as responsive predicted higher relationship satisfaction at the 6 month follow-up (Algoe et al., 2013). This association persists even when controlling for initial relationship satisfaction, and perceived responsiveness ratings after discussing either a positive or negative event with the romantic partner (Algoe et al., 2013). There seems to be a unique influence of being the recipient of a responsive expression of appreciation.

Why are people unwilling to express gratitude?

Though there are clear benefits to both feeling and expressing gratitude, sometimes people are unwilling to express their appreciation to others. As research accumulates on the benefits of feeling thankful, the boundary conditions of when people share their appreciation with others have not been well-established. Some research has explored which factors inhibit feeling grateful in the first place. Indebtedness and suspicion about the benefactor's motives, which were both discussed earlier in this proposal, were noted by Watkins as inhibitors of gratitude (Watkins, 2014). Materialism and envy have also been linked with lower levels of gratitude (Kashdan & Breen, 2007; Lambert, Fincham, Stillman, & Dean, 2009; McCullough et al., 2002; Watkins, 2014). If someone feels envious and places great value on acquiring material goods, their focus is on what they have yet to acquire rather than the good things they already have, thus reducing their feelings of gratitude. One last gratitude inhibitor is narcissism. When controlling for self-esteem, narcissism is negatively correlated with gratitude (McLeod, Maleki, Elster, & Watkins, 2005). Since narcissism is characterized by arrogance and

self-focus, narcissistic individuals are likely to either feel entitled to the benefits others provide them (Watkins, 2014), or experience difficulty in expressing gratitude since they feel they do not need others (McWilliams & Lependorf, 1990).

Though many reasons have been provided for why people may not feel grateful, the proposed research will extend this literature by examining what leads people who feel grateful to forgo expressing their appreciation. People may appreciate others in their life, but still hesitate at times to express gratitude, or may not express as much gratitude as they feel. My research will focus on two factors that may influence people's unwillingness to express gratitude to others. First, public self-consciousness and social anxiety have been linked with feeling more indebted and less grateful, but it has not been empirically established how self-consciousness and social anxiety influence the willingness to express gratitude to others. I anticipate that the effects on gratitude expression will be similar, and that individuals who are more self-conscious and those who are prone to social anxiety will be less willing to express gratitude to others, due to heightened feelings of indebtedness and self-focus.

Next, I anticipate that self-regulation will also influence how willing people are to express gratitude. Though emotion regulation research suggests suppressing emotions is effortful (John & Gross, 2004; Rimé, 2009), it is conceivable that revealing emotions to others may also require effort. Telling others that we appreciate them can be considered a form of self-disclosure, which has the potential to increase levels of intimacy in a relationship (Pronin, Fleming, & Steffel, 2008). Self-conscious individuals may feel even more concerned with how other people will respond to and interpret their self-disclosure,

resulting in this form of social sharing requiring self-regulatory effort. Additionally, if gratitude expression requires self-regulation, it may not be prioritized when people are busy, distracted, or tired.

Furthermore, if gratitude is considered a form of relationship maintenance, it is likely to require the same effortful processes that underlie maintenance strategies. The relationship maintenance literature has established that processes like forgiveness, accommodation, and resisting attractive alternatives, require self-regulatory resources to enact. The primary explanation for why self-regulatory resources are utilized when people engage in relationship maintenance behaviors is that people undergo a transformation of motivation from short-term self-gratification to long-term relationship benefits (Rusbult et al., 2001). Self-regulation in these circumstances is used to shift away from a self-focused mindset that prioritizes immediate self-interests, which is considered the default mode (Rusbult & Agnew, 2010; Yovetich & Rusbult, 1994). There are theoretical differences in the conceptualization of self-focus across the relationship maintenance literature and gratitude literature, with the relationship maintenance research emphasizing immediate self-interest when romantic partners have incompatible desires and goals, and the gratitude literature emphasizing dispositional self-consciousness, or the tendency to cognitively focus on the self. However, both lines of research similarly find that self-focus is associated with detrimental outcomes. Both theoretical approaches can be used to better understand why people may be unwilling to express gratitude. When people express gratitude to others self-regulatory resources may be utilized to reduce self-focus, both to help people focus on long-term goals underlying relationship

maintenance and to combat feelings of indebtedness that might make people less willing to express their appreciation to others. For these reasons, I anticipate that deficits in self-regulatory resources will be associated with unwillingness to express gratitude, particularly for individuals who are high in self-consciousness.

Self-Regulation and Relationship Maintenance

Self-regulation is broadly defined as purposeful goal-directed behavior (Bandura, 1991; Hofmann, Schmeichel, & Baddeley, 2012; Wagner & Heatherton, 2015). Importantly, self-regulation includes both behavioral initiation and inhibition (Wagner & Heatherton, 2015). According to Hofmann and colleagues, who link perspectives from cognitive and social psychology, the three primary components comprising self-regulation are: (1) self-endorsed standards of behaviors, feelings, and thoughts, (2) the motivation to maintain consistency between personal standards and one's behaviors, and (3) having the capacity and resources to behave in a goal-directed manner (2012). Social psychologists Luchies, Finkel, and Fitzsimons similarly propose that there are three components of self-regulation: content, strength, and strategies (2011). Although the two sets of researchers use different terms, there is a great deal of conceptual overlap. Self-regulatory content is the goals that people regulate toward, or the self-endorsed standards of behaviors, feelings, and thoughts. Self-regulatory strength refers to the capacity and resources people have to behave in a goal-directed manner. At this point the two camps diverge, however, with Hoffman and colleagues emphasizing a motivational component, and Luchies and colleagues emphasizing the specific behaviors and strategies people use

to self-regulate. In my research, the component of self-regulation that I will focus on is that of self-regulatory capacity, which is emphasized in both psychology disciplines.

Within the domain of self-regulation, there is a rich literature on self-control, which specifically the process of overriding thoughts or emotions that detract from overarching goals (Inzlicht, Schmeichel, & Macrae, 2014). Research on self-control emphasizes the behavioral inhibition component, with a focus on resisting temptation and delaying gratification when indulgence hinders long-term goal striving. In the context of close relationships, maintenance requires such effort, often in the form of inhibiting current desires in favor of behaviors that promote long-term relationship benefits (Rusbult et al., 2001). When couples interests and preferences align, relationship maintenance is easy. However, conflicts of interest do arise. Perhaps your partner may want to go out and eat Chinese food while you're in the mood for Italian, or you may have a physically attractive coworker who flirts with you on the job. In these situations, one partner's immediate well-being may be incompatible with the well-being of the other partner, which presents a test of relationship commitment (Rusbult et al., 2001). Transformation of motivation from pursuing short-term gratification to promoting long-term goals frequently is necessary to foster relationship maintenance behaviors.

If gratitude is a form of relationship maintenance, one factor that may contribute to willingness to express gratitude to a romantic partner is self-control. Though expressing gratitude probably does not require inhibition of current goals or desires, it may require effort such that one needs to be aware of the benefits afforded by others, and it takes time to acknowledge the benefactor. Self-awareness, and monitoring the

consistency between personal standards and behavior, both promote self-regulation (Wagner & Heatherton, 2015). Prior research has linked high levels of self-control with relationship maintenance behaviors, since relationship maintenance mechanisms are effortful processes that require inhibition of immediate self-focused actions (Rusbult et al., 2001). Early research examined how self-regulatory capacities influenced accommodation, the willingness to behave constructively rather than retaliating, in response to a romantic partner's destructive behavior. Retaliation is considered an automatic impulse that would satisfy the individual's immediate needs and desires. Finkel and Campbell (2001) found that high levels of dispositional and situational self-regulatory strength were associated with a greater likelihood of responding accommodately.

Self-regulatory capacity has also been conceptualized in terms of executive functions, which are cognitive processes that work together to regulate and shape behavior, thoughts and feelings in a goal-directed manner (Blair & Ursache, 2010; Duckworth & Kern, 2011; Hofmann et al., 2012). Executive functions are higher order processes that are rational and deliberate compared to lower order, automatically activated processes, such as emotion, attention, and stress physiology (Blair & Ursache, 2010; Hofmann et al., 2012). The three commonly examined executive function processes are working memory, inhibition, and task shifting (Blair & Ursache, 2010; Hofmann et al., 2012). Working memory is the ability to update task-relevant information, inhibition is the ability to resist enacting an automatic response, and task

switching is the ability to move between several tasks (Blair & Ursache, 2010; Hofmann et al., 2012).

Executive functions, like self-control, have also been linked to relationship maintenance behaviors. Pronk and colleagues found that performing better on executive function tasks in the laboratory was associated with better resisting and derogating romantic alternatives (Pronk, Karremans, & Wigboldus, 2011), forgiving a romantic partner after a transgression (Pronk, Karremans, Overbeek, Vermulst, & Wigboldus, 2010), and increased willingness to sacrifice for a romantic partner (Pronk & Karremans, 2014). Again, if gratitude is a relationship maintenance behavior, it will likely be influenced by executive function capacity. However, executive functions are most likely associated with expressing gratitude, not feeling grateful, since, by definition, emotions are not included in these relevant higher order cognitive processes. Most likely, gratitude expression will be promoted when individuals are better able to move between several tasks, and successfully utilize their working memory to update task-relevant information, as both attentional processes should promote awareness of both the benefits others provide the self, and the relationship quality benefits that come from expressing gratitude.

While executive functioning is correlated with dispositional gratitude (Kruger, 2011), research has not yet established whether self-regulation is associated with the interpersonal process of feeling and expressing gratitude. DeSteno argues that gratitude is an emotion that promotes positive outcomes both in terms of short-term gratification and long-term benefits (2009), which goes against the typical self-control framework that emphasizes inhibiting short-term desires that conflict with long-term goals (Wagner &

Heatherton, 2015). However, the supporting research DeSteno cites (2009) does not explicitly mention gratitude expression. Additionally, if self-regulation is considered broadly, gratitude expression may require resources that involve initiating positive behavior or behaving in a less inhibited way, rather than inhibiting impulses and temptations. One form of self-regulation that may be more relevant to the process of gratitude is hypo-egoic regulation (Leary, Adams, & Tate, 2006; Leary et al., 2010).

Hypo-egoic Regulation

Hypo-egoic regulation (Kruse et al., 2014; Leary et al., 2006, 2010) is a form of self-regulation that is relevant to this proposed process, and is when “people relinquish deliberate, conscious control over their own behavior so they will respond more naturally, spontaneously, or automatically” (Leary et al., 2006). In other words, hypo-egoic self-regulation is when people use self-control resources to decrease the influence of self-focus (Leary et al., 2006), and has been associated with other-focused states (Kruse et al., 2014; Leary & Guadagno, 2011). Specifically, humility, which is closely associated with gratitude (Kruse et al., 2014) has been established as a hypo-egoic state (Leary & Guadagno, 2011). If gratitude’s mechanistic features similar to humility, it is likely that individuals who have difficulty engaging in hypo-egoic regulation will also have difficulty entering the other-focused state that typically precedes gratitude expression. Trait self-consciousness has been established as the main disposition associated with difficulty engaging in hypo-egoic regulation (Leary et al., 2010). I predict that for individuals who are more self-focused there will be a strong association between self-regulatory capacity and willingness to express gratitude, because they will need to utilize

more self-regulatory resources to engage in the hypo-egoic regulation that underlies gratitude.

Leary and colleagues (2010) make different theoretical predictions about how hypo-egoic regulation relates with the three self-consciousness factors. Specifically, they propose that individuals high in SR private self-consciousness and individuals high in public self-consciousness will have more difficulty with hypo-egoic regulation (Leary et al., 2010). Again, since ISA is associated with nonevaluative present-focused thinking, Leary and colleagues suggest that individuals high on ISA will be better at engaging in hypo-egoic regulation (2010). The theoretical connection between self-consciousness and hypo-egoic regulation corresponds with Mathews and Green's findings that high self-focus is associated with experiencing less gratitude, which is a hypo-egoic state, and more indebtedness (2010). I anticipate the results will be similar for willingness to express gratitude, and that individuals high in SR private self-consciousness and public self-consciousness will have a strong positive association between self-regulation capacity and willingness to express gratitude.

Current Research

Existing research aptly surveys the benefits of experiencing gratitude and expressing it to others. However, it has not explicitly examined why people are sometimes unwilling to express gratitude and the specific factors that reduce interpersonal gratitude expression. Since there are ample benefits surrounding gratitude, identifying factors that hinder the process is an important stepping stone in promoting not only gratitude expression, but intrapersonal and interpersonal well-being. In the proposed

research, I will examine interpersonal gratitude expression across multiple relationship contexts, rather than solely in the romantic relationship context, with the goal of identifying a general underlying process of the experience and expression of gratitude. In investigating why people do not always express gratitude to others, the following hypotheses will be tested:

Hypothesis 1a – High dispositional self-regulatory capacity is associated with greater willingness to express gratitude to others. Since executive functions are associated dispositional gratitude (Kruger, 2011), it is likely that self-regulatory resources are also utilized in interpersonal gratitude expression. I predict that individuals who have higher levels of trait self-control should also report greater willingness to express gratitude to others.

Hypothesis 1b – Self-regulatory depletion is associated with less gratitude expression. While dispositional self-control should predict a greater general tendency to be willing to express gratitude, on a day to day basis people vary in the amount of self-regulatory resources they have available. I anticipate that when individuals are depleted, i.e., low in self-regulatory resources, they will be less willing to express gratitude to others.

As I discussed earlier, gratitude is defined as an other-focused emotion (Algoe & Haidt, 2009; McCullough et al., 2001; Watkins et al., 2006) and is closely related to other-focused states like empathy (DeWall et al., 2012) and humility (Kruse et al., 2014). When considering why people might not express gratitude to others, it is likely that their focus is not on the other person, and has shifted back to the self. The most common way

to assess the tendency to be self-focused is by measuring private and public self-consciousness (Leary et al., 2010; Mellings & Alden, 2000; Mor & Winquist, 2002; Robins, Nofle, & Tracy, 2007). Since these different forms of self-focus result in unique sets of outcomes, I propose the subsequent hypotheses for how each form of self-focus will relate to gratitude expression.

Hypothesis 2a – People higher in public self-consciousness will report lesser willingness to express gratitude. Individuals who are concerned with how others perceive them are more prone to social anxiety, embarrassability, shyness, and loneliness, which are states characterized by dwelling on social evaluation (Bruch, Hamer, & Heimberg, 1995; Edelmann, 1985; Hope & Heimberg, 1988; Leary et al., 2010; Miller, 1996; Moore & Schultz, 1983). Public self-consciousness is particularly relevant to gratitude expression, because it is the form of self-consciousness that is clearly rooted in social contexts. Additionally, public self-consciousness is negatively associated with feeling grateful and positively associated with feeling indebted (Mathews & Green, 2010). I anticipate that individuals high in public self-consciousness will be less willing to express gratitude, because they will feel more indebted, leading them to focus more on how or if they can return the favor, rather than focusing primarily on the good that the other person has done.

Hypothesis 2b – People higher in SR private self-consciousness will report lesser willingness to express gratitude. Similar to public self-consciousness, SR private self-consciousness is associated with a variety of negative outcomes, such as neuroticism, anxiety, shame, guilt, and low agreeableness (E. M. Anderson et al., 1996; Conway &

Giannopoulos, 1993; Scandell, 2001; Trapnell & Campbell, 1999). Like public self-consciousness, SR private self-consciousness is positively associated with feeling indebted (Mathews & Green, 2010). However, there is not a significant correlation between SR private self-consciousness and how grateful someone feels (Mathews & Green, 2010). SR private self-consciousness differs from public self-consciousness in that it is more introspective negative self-preoccupation, without an explicit social evaluation aspect. Since SR private self-consciousness is associated with multiple self-focused emotions, like indebtedness, shame, guilt, which are incompatible with feelings of gratitude, I predict that it will be associated with lower willingness to express gratitude.

Hypothesis 2c – People higher in ISA private self-consciousness will report greater willingness to express gratitude. ISA differs from both public self-consciousness and SR private self-consciousness, because this form of private self-consciousness tends to be present-focused, concrete, and nonevaluative (Leary et al., 2010). Fittingly, ISA is not maladaptive, and is associated with better mental health (E. M. Anderson et al., 1996). I predict that since ISA does not have a negative evaluative component, that it will be associated with more willingness to express gratitude.

Hypothesis 2d – People higher in social anxiety will report lower willingness to express gratitude. Social anxiety is associated with feeling less grateful and more indebted in response to benefits afforded by others (Mathews & Green, 2010). I predict that, similar to aforementioned correlation, high levels of social anxiety will be associated with lower willingness to express gratitude.

The next step in unpacking the underlying mechanisms of gratitude expression is to establish how self-regulation and self-consciousness interact with one another in this process. I expect that, individuals who are high in all forms of self-consciousness, except for ISA, and those who are high in social anxiety will require more self-regulatory resources when expressing gratitude than individuals low in self-consciousness. Specifically, I predict there will be a strong association between self-regulatory capacity and willingness to express gratitude for self-conscious individuals because they will utilize more self-regulatory resources to engage in the hypo-egoic regulation that underlies gratitude.

I anticipate that individuals with lower trait self-control who are highly self-conscious will be the least willing to express gratitude, since their heightened feelings of indebtedness and self-focus will detract from the other-focused state that precludes gratitude expression. Based on the Leary and colleagues (2010) theoretical associations between self-consciousness and hypo-egoic regulation, I propose the following specific hypotheses for the different forms of self-consciousness.

Hypothesis 3a – People higher in public self-consciousness will have a positive association between self-regulatory capacity and willingness to express gratitude

Hypothesis 3b – People higher in SR private self-consciousness will have a positive association between self-regulatory capacity and willingness to express gratitude.

Hypothesis 3c – People lower in ISA private self-consciousness will have a positive association between self-regulatory capacity and willingness to express gratitude.

Hypothesis 3d – People higher in social anxiety will have a positive association between self-regulatory capacity and willingness to express gratitude.

Similar to the predictions I made in hypothesis 3 regarding trait self-regulatory capacity, I expect to replicate these findings when examining state self-regulatory depletion. That is, when people are depleted of their self-regulatory resources, I expect that those who are higher on public self-consciousness and those higher in SR private self-consciousness will be less willing to express gratitude. Below are my specific hypotheses for these different forms of self-consciousness.

Hypothesis 4a – Self-regulatory depletion will be associated with less willingness to express gratitude to others for individuals who are higher in public self-consciousness relative to individuals who are lower in public self-consciousness.

Hypothesis 4b – Self-regulatory depletion will be associated with less willingness to express gratitude to others for individuals who are higher in SR private self-consciousness relative to individuals who are lower in SR private self-consciousness.

Hypothesis 4c – Self-regulatory depletion will be associated with less willingness to express gratitude to others for individuals who are lower in ISA private self-consciousness relative to individuals who are higher in ISA private self-consciousness.

Hypothesis 4d – Self-regulatory depletion will be associated with less willingness to express gratitude to others for individuals who are higher in social anxiety relative to individuals who are lower in social anxiety.

Pilot Studies

Pilot Study 1

The goal of this study was to establish which relationship qualities and individual differences are correlated with gratitude expression. Establishing these correlates better informs my research by providing evidence that the proposed studies are indeed examining factors that are significantly correlated with gratitude expression. Additionally, factors that are uncorrelated with gratitude will be omitted from the proposed studies, permitting a more parsimonious examination.

Subjects

Two hundred seventy-seven individuals were recruited through ResearchMatch.com. All subjects were at least 18 years of age and native English speakers. Additionally, only individuals who are currently in a romantic relationship completed this survey. I screened for attentive responding utilizing an instructional manipulation check (Oppenheimer, Meyvis, & Davidenko, 2009), and 125 individuals (45%) were flagged as inattentive responders. The Mahalanobis distance technique was used to screen for outliers, and among the 152 attentive responders, 8 multivariate outliers were detected. After cleaning the data, data from 144 individuals were included in analyses.

Procedure

This study was conducted online, and took subjects approximately 20 minutes to complete. Subjects responded to measures described below.

Measures

Expression of Gratitude in Relationships. I used Lambert and colleagues' (2010) 3-item Expression of Gratitude in Relationships Measure to assess how willing individuals are to express gratitude to their romantic partner ($\alpha=.86$). Subjects rated the extent to which they endorse the following items: "I express my appreciation for the things that my partner does for me," "I let my partner know that I value him/her," and "When my partner does something nice for me I acknowledge it." While Lambert and colleagues used a 1 to 5 scale ranging from "*Never*" to "*Very Frequently*," I modified the anchors to read as "*Rarely*" to "*Very Frequently*," since it seems unlikely that an individual would report that they never express gratitude to his or her romantic partner.

Trait Self-Control. I used the 13-item version of Tangney, Baumeister, and Boone's (2004) Trait Self-Control Scale ($\alpha=.84$). This scale is meant to assess how well an individual exerts self-control in general. Subjects responded to items like "I am good at resisting temptation" and "I refuse things that are bad for me" on a 1 to 5 scale ranging from "*Not at all*" to "*Very much*."

Relationship Power. An adapted version of The Relationship Power Inventory (RPI; Farrell, Simpson, & Rothman, 2015) was used to assess relationship power ($\alpha=.76$). Ten common domains in which couples typically make decisions about, such as finances, vacations, and how to spend time together, were used in this measure. For each of the ten

domains, subjects were asked to rate how often they make decisions in the domain, ranging from 0%-100% of the time with 0% representing having no input at all, 50% representing that each partner has equal input, and 100% representing having all of the input.

Quality of Alternatives. The Quality of Alternatives subscale from Rusbult, Martz, and Agnew's (1998) Investment Scale was also used to assess relational power. This subscale has two sets of items, which utilize facet measures, or specific examples of the construct, and global measures, or general items characterizing the construct. The facet measure asked subjects to indicate the degree to which their intimacy, companionship, sexual, security, and emotional involvement needs could be fulfilled by alternative relationships ($\alpha=.81$). These items used a 1 to 4 scale, which ranges from *"Don't At All Agree"* to *"Agree Completely."* The purpose of the facet measure is to activate the construct and increase the validity and reliability of the global items (Rusbult et al., 1998). In line with this reasoning, following the facet measure is the global measure, which has 5-items ($\alpha=.80$) (e.g., "My alternatives to our relationship are close to ideal (dating another, spending time with friends or on my own, etc.)," and "If I weren't dating my partner, I would do fine – I would find another appealing person to date."). Subjects rated items on the global measure on a 0 to 8 scale, ranging from *"Do Not Agree At All"* to *"Agree Completely."*

Attachment Style. The 18-item version of the Experiences with Close Relationships scale (Fraley, Waller, & Brennan, 2000) was used to assess attachment insecurity. This scale includes 9 items that assess attachment anxiety ($\alpha=.93$) (e.g., "I was

afraid that I would lose my partner's love", and "I often worried that my partner didn't really love me") and 9 items that assess attachment avoidance ($\alpha=.90$) (e.g., "I didn't feel comfortable opening up to romantic partners" and "I preferred not to show a partner how I feel deep down"). Subjects rated these items on a 1 to 7 scale ranging from "*Strongly Disagree*" to "*Strongly Agree*".

Self-Esteem. Rosenberg's (1965) 10-item Self-Esteem scale was used ($\alpha=.91$). Subjects rated items like "I feel that I am a person of worth, at least on an equal plane with others" and "I take a positive attitude toward myself" on a 1 to 7 scale, ranging from "*Strongly Disagree*" to "*Strongly Agree*."

Shyness. The Shyness and Sociability Scale (Cheek & Buss, 1981) was used to assess dispositional comfort in social situation. Subjects rated 9 shyness items ($\alpha=.87$) (e.g., "I feel inhibited in social situations") and 5 sociability items ($\alpha=.84$) (e.g., "I welcome the opportunity to mix socially with people") on a 0 to 4 scale, ranging from "*Extremely Uncharacteristic*" to "*Extremely Characteristic*".

Trust. The Dyadic Trust Scale (Larzelere & Huston, 1980) was used to assess relational trust ($\alpha=.92$). Subjects rated 8-items, such as "I feel that I can trust my partner completely" and "I feel that my partner can be counted on to help me" on a 1 to 4 scale, ranging from "*Not at all*" to "*Very much*".

Communal Strength. Previous research suggests that gratitude expression can increase perceptions of communal strength in a relationship (Lambert et al., 2010). Additionally, Algoe suggests that gratitude promotes communal relationship norms (2012). Since communal strength is an established component of the relationship

processes surrounding gratitude expression, I used Mills and colleagues (2004) Communal Strength Measure ($\alpha=.85$) to examine whether or not the same associations exist in our sample. Subjects responded to 10-items, such as “How far would you be willing to go to visit your romantic partner?” and “How large of a benefit would you be likely to give your romantic partner?” on a 0 to 10 scale, ranging from “*Not at all*” to “*Extremely*”.

Relationship Satisfaction. Relationship satisfaction is also likely to influence gratitude expression. Subjects completed the 4-item version of the Couple’s Satisfaction Index ($\alpha=.94$) (Funk & Rogge, 2007), which includes the items “Please indicate the degree of happiness, all things considered, of your relationship”, “I have a warm and comfortable relationship with my partner”, “How rewarding is your relationship with your partner?” and “In general, how satisfied are you with your relationship?” Subjects will be asked to respond to the first item on a 0 to 6 scale ranging from “*Extremely unhappy*” to “*Perfect*”, and the items on a 0 to 5 scale ranging from “*Not at all*” to “*Completely*”.

Relationship Commitment. Relationship commitment was measured using an elaborated version of the commitment subscale from Rusbult and colleagues Investment Model Scale ($\alpha=.95$) (Rusbult, Kumashiro, Kubacka, & Finkel, 2009; Rusbult et al., 1998). Subjects rated 15-items, such as “I will do everything I can to make our relationship last for the rest of our lives” and “I am completely committed to maintaining our relationship” on a 0 to 8 scale, ranging from “*Do not agree at all*” to “*Agree completely*”.

Closeness. Relationship closeness was measured using the Inclusion of the Other in the Self Scale (Aron, Aron, & Smollan, 1992). Subjects were shown a series of 7 different sets of overlapping circles, with one circle representing the self and the other circle representing the other, and were asked to select which pair of circles best describes their romantic relationship. The 7 sets of circles varied in how much the two circles overlapped, with more overlap representing more closeness and inclusion of the other in the self.

Demographics. Using 9 items, information about age, gender, race and ethnicity, sexual orientation, education, relationship status, and relationship length was gathered.

Pilot Study 1 Results

Willingness to express gratitude was significantly correlated with relationship satisfaction, $r(144)=0.38, p<.001$, dyadic trust, $r(144)=0.26, p<.01$, self-esteem, $r(144)=0.26, p<.01$, communal strength, $r(144)=0.32, p<.001$ (see Table 1 for correlations between all study measures). Self-control, $r(144)=.16, p=.06$, and quality of alternatives facet, $r(144)=-0.16, p=.06$, and global were marginally correlate with willingness to express gratitude. There were not significant correlations between willingness to express gratitude and relationship power, shyness, sociability, anxious attachment, avoidant attachment, inclusion of the other in the self, age, or gender. This correlational pilot data provided preliminary evidence for hypothesis 1a, that self-control is positively associated with gratitude expression. Additionally, these correlational results informed which measures were selected as control variables in this work.

Pilot Study 2

Next, I sought to acquire qualitative evidence about the reasons people provide for why they do not express gratitude to others, or general reasons why people would not express gratitude. Open-ended responses provide evidence of whether or not people are consciously aware that self-regulatory resources are required for gratitude expression.

Subjects

Seventy individuals were recruited through Amazon.com's Mechanical Turk. All subjects were at least 18 years of age and native English speakers. Subjects were paid \$0.20.

Procedure

This study was conducted online. Subjects responded to the following questions:

1. Think back to the last time you expressed gratitude to someone.

Expressing gratitude can range from thanking someone for buying you lunch to thanking them for being a good listener. Who did you express gratitude to? What did you express gratitude to them for? How did you feel after expressing gratitude to this person?

2. Sometimes people feel uncomfortable expressing gratitude to others.

Think of the last time you felt grateful to another person but didn't say anything. Why didn't you?

3. When do you think a person would feel uncomfortable expressing gratitude and why do you think they would feel this way?

4. Have you ever felt grateful to another person, but didn't say anything because you felt distracted, busy, or that it would require too much effort to do so? If so, describe the situation that led you to feel this way.

This survey took subjects approximately 5 minutes to complete.

Pilot Study 2 Results

When coding the first 3 questions, I first went through the open-ended responses and distilled the participants' examples into either a one word category or a concise description of their example using as few words as possible. After this first round of coding, I went through the codes and looked for overlapping themes. For instance, people described expressing gratitude to their parents, their children, or their siblings, and each of these categories fall under a broader category – family. When there was conceptual overlap, I recoded the specific code into the broader one, in order to get a better sense of which broad categories were more prevalent in the descriptions of gratitude expression. For codes that were very specific and rare, I recoded them into a category I called “other”.

First, I coded participants' open-ended responses to question 1, to get a sense of who people express gratitude to, what they are grateful for, and how they feel after expressing gratitude. I also coded whether participants gave examples of generalized or specific gratitude, based on Lambert and colleagues (2009) conceptualizations. This will provide whether a generalized or specific approach is a better conceptual fit when examining gratitude expression. Seventy participants responded to the first question. One participant did not answer the question correctly, and another participant provided two

examples of gratitude expression. Accounting for these two participants, 70 examples of gratitude expression were included in the coding. I found that most participants reported expressing gratitude to their family (26%), friends (21%), romantic partner (17%), and co-workers (10%). The most frequent things that participants reported being grateful for were others buying them food (24%), supporting them (20%), and loaning or giving them money (14%). Other less frequent categories are listed in Tables 2 and 3. The majority of participants described expressing gratitude for specific favors (77%), but just below a quarter of participants described expressing generalized gratitude to others (23%). When participants did describe generalized gratitude, they typically described being grateful for feeling generally supported by another person, or being grateful that the other person is reliable. Forty-five of the 70 respondents described how they felt after they expressed gratitude. Thirty-six (80%) of these participants felt an increase in positive emotion after they expressed gratitude, often saying that it felt good to express their feelings or it felt great making the other person feel appreciated. The remaining participants felt negative emotions (9%), no change in emotion (9%), or both positive and negative emotions (2%) after expressing gratitude.

Next I coded questions 2 and 3, which focused on why people do not express gratitude to others. I coded these questions in the same way, since they were similar in content, with question 2 focusing on why the participant does not always express gratitude and question 3 focusing on why the participant thinks other people do not always express gratitude. I looked for broad themes in their descriptions of why they did not express gratitude, and why others do not express gratitude. If the participant provided

more than one reason, I listed each reason that the participant provided. Sixty five participants answered question 2. The majority of participants (91%) provided one reason for why he or she did not always express gratitude to others. Five participants (8%) provided 2 reasons, and one participant (2%) provided 3 reasons. There were 72 reasons in total provided for question 2. Sixty three participants answered question 3. Similarly, most participants (63%) provided one reason for why other people do not always express gratitude to others. However, more participants provided multiple reasons, with 20 participants (32%) providing 2 reasons and 3 participants (5%) providing 3 reasons. There were 89 reasons in total provided for question 3.

For question 2, which focused on why the participant does not always express gratitude, there was not an overwhelming consensus across participants' responses. Many participants (17%) said they did not express gratitude because it is awkward, which includes reasons such as gratitude expression can be embarrassing and uncomfortable, and that they don't know how to approach the person. Additionally, being too close or not close enough to the other person can make gratitude expression awkward. Another subset of participants (14%) said they do not always express gratitude because it is unnecessary, and that other people already know. Additionally, participants noted that gratitude expression was unnecessary either because the behavior was expected, helping is a duty, or that the person helping acted like the favor was not a big deal. Some participants (13%) said they did not express gratitude because the helper did not deserve it. The helper was undeserving of gratitude when they provided bad service, or if they were disingenuous or manipulative. Participants also described that sometimes they did

not want to be helped, and that others should not be thanked for unsolicited favors. Yet another group (11%) described that they did not always express gratitude due to reasons related to self-control. More specifically, these participants noted that they did not express gratitude because they forgot, or they were busy, lazy, tired, overwhelmed, sick or distracted. Finally, a group of participants (14%) said that they never have this problem and always express gratitude to others. Though this is not the majority of people, it will be important to keep in mind in the proposed studies that some individuals do not have difficulty expressing gratitude to others. The remaining reasons for why people do not express gratitude are provided in Table 4.

For question 3, which focused on why other people do not always express gratitude, many participants (36%) said that insecurity is the main reason why people do not express gratitude. More specific reasons that fell under this broad category of insecurity were that people do not express gratitude if they are shy, embarrassed to receive help, are worried about looking incompetent, are generally uncomfortable expressing emotions, are worried about embarrassing the benefactor, don't want to feel vulnerable or show weakness, or feel guilt or shame. Fifteen participants (17%) said that other people do not express gratitude because it is awkward, 10 participants (11%) said others do not express gratitude when the benefactor does not deserve it, and 9 participants (10%) said others do not express gratitude because of their pride.

In question 4, I asked participants directly whether they have felt grateful, but didn't say anything because they felt distracted, busy, tired, or that it would require too

much effort. Sixty four participants answered this question, and 36 (56%) acknowledged that they have experienced such a situation.

The results of this qualitative investigation suggested that there was great variety in who people express gratitude to and what favors elicit gratitude expression. However, of greatest importance to this work, I found that people often indicated that insecurity was a reason behind why people choose not to express gratitude. More than half of the subjects in this study also endorsed that feeling depleted of self-regulatory resources has resulted in them not taking the time to express gratitude when they felt it. This provided preliminary support for the idea that self-control and self-consciousness are important predictors of gratitude expression.

Chapter 2: Study 1

The purpose of Study 1 was to replicate the association between trait self-control and willingness to express gratitude that was found in the pilot data, and to examine the association between trait self-consciousness and willingness to express gratitude. Specifically, I anticipated that individuals who were higher on public self-consciousness and SR private self-consciousness would report lower willingness to express gratitude. Additionally, I anticipated that the association between self-control and willingness to express gratitude would be stronger for individuals who were more self-conscious. This study used the same procedure as the correlational pilot study, and a measure of self-consciousness was added. A measure of feeling grateful for a romantic partner was also added. This allowed me to test if the correlation between feeling grateful and self-control

is of the same magnitude as the correlation between willingness to express gratitude and self-control.

Problems of inattentive responding that were encountered in pilot study 1 were addressed in two ways. First, only measures in pilot study 1 that were marginally or significantly correlated with self-reported willingness to express gratitude were included in study 1. Reducing the number of measures should lessen subject burnout, therein increase attentive responding. Additionally, a better measure of attentive responding was used. In this study I used the Directed Question approach (Maniaci & Rogge, 2014). A question was included among the substantive scales in which subjects were directed to select a specific answer (e.g., “Please skip this question”). This measure of attentive responding is less stringent than the approach used in Pilot Study 1, but still effectively screens for inattentive responding.

Subjects

Three hundred sixty two individuals were recruited through ResearchMatch.com. All subjects were at least 18 years of age (range: 18-75, mean age = 37.12, SD = 14.74), and native English speakers. Three hundred twenty seven (90.3%) of the 362 respondents passed both attention checks included in the survey. One participant was not currently in a romantic relationship, and was dropped from the dataset. I screened the remaining 326 participants for multivariate outliers using the Mahalanobis distances technique. Two multivariate outliers were detected and removed from the dataset. This means the final dataset consisted of 324 participants. The final sample was predominantly female

($n=243$) and Caucasian ($n=267$). The majority of the sample identified as heterosexual ($n=287$), and most were either in a committed relationship ($n=133$) or married ($n=146$).

Procedure

This study was conducted online. Subjects were asked to respond to a variety of measures.

Measures

The following measures from the correlational pilot were included in Study 1: Willingness to express gratitude ($\alpha=.83$), trait self-control ($\alpha=.87$), relationship satisfaction ($\alpha=.92$), communal strength ($\alpha=.81$), self-esteem ($\alpha=.92$), dyadic trust ($\alpha=.90$), quality of alternatives (facet ($\alpha=.88$) and global ($\alpha=.81$) subscales), and commitment ($\alpha=.93$). A new measure was included in Study 1 to assess self-focus in terms of dispositional self-consciousness.

Self-Consciousness. Self-focus was measured using the Public and Private Self-Consciousness Scales (Fenigstein et al., 1975). The private self-consciousness scale consists of two factors: self-reflectiveness (SR) and internal state awareness (ISA; E. M. Anderson et al., 1996). The original scales consist of 23 items. In order to reduce participant burden, I used the 3 items from each subscale that had the highest factor loadings based on Fenigstein and colleague's original scale development paper (1975) for public self-consciousness and social anxiety, and Anderson and colleague's private self-consciousness scale development paper (1996) for SR and ISA. This means subjects responded to 12 items in total. The items subjects rated from the SR subscale were "I'm always trying to figure myself out," "I'm constantly examining my motives," and "I

sometimes have the feeling that I'm off somewhere watching myself." The items from the ISA subscale subjects rated were "I reflect about myself a lot," "I'm generally attentive to my inner feelings," and "I'm alert to changes in my mood." The items from the public self-consciousness subscale subjects rated were "I'm concerned about the way I present myself," "I usually worry about making a good impression," and "I'm usually concerned about what other people think of me." The items from the social anxiety subscale subjects rated were "It takes me time to overcome my shyness in new situations," "I get embarrassed very easily," and "Large groups make me nervous." For each of the items, subjects rated how characteristic the statement is of them on a scale ranging from 0 "*Extremely uncharacteristic*" to 4 "*Extremely characteristic*." The reliabilities for these subscales were $\alpha = .72$ for SR private self-consciousness, $\alpha = .61$ for ISA private self-consciousness, $\alpha = .75$ for public self-consciousness, and $\alpha = .81$ for social anxiety.

Feelings of Gratitude and Indebtedness. In addition to gratitude expression, subjects were also asked how grateful and indebted they feel toward their romantic partner. Measuring both feelings of gratitude and indebtedness provided better insight on when subjects were most likely to report expressing gratitude to their romantic partner. The following prompt was used:

"People feel many different things as a result of others' actions on any given day or at any given time. Using a 0 (not at all) to 6 (very much) scale, please indicate how each item describes how you feel as a result of your romantic partners' actions toward you."

These instructions were borrowed from Algoe and colleagues' daily diary study on gratitude and indebtedness in romantic relationships (2010). Gratitude was assessed with the items grateful, thankful, and appreciative, and indebtedness was assessed with the items indebted, and obligated (Tsang, 2006b). The reliability for gratitude was $\alpha=.88$ and the reliability for indebtedness was $\alpha=.74$.

Results

Gratitude expression, gratitude emotion, and indebtedness emotion frequencies

On average, subjects reported their willingness to express gratitude to their romantic partner was 4.62 (sd = 0.53). The average amount of gratitude subjects reported feeling toward their partner was 5.05 (sd = 1.02) and the average amount of indebtedness subjects reported feeling toward their partner was 2.20 (sd = 1.66). This shows subjects reported slightly higher feelings of gratitude relative to gratitude expression, and that feeling indebted to a romantic partner was rare in this sample.

Gratitude expression correlates

Correlations were used to examine the associations between relationship qualities and individual differences with willingness to express gratitude. These correlations are reported in Table 5. Hypothesis 1a, which is that gratitude expression would be positively and significantly correlated with self-control, was supported, $r(323)=.15, p<.01$. This indicates that high dispositional self-control is associated with greater willingness to express gratitude to a romantic partner. I also anticipated that there would be significant correlations between gratitude expression and self-consciousness (Hypotheses 2a-2d).

Hypothesis 2c was supported, such that being high on ISA private self-consciousness was associated with greater willingness to express gratitude, $r(323)=.24, p<.001$. Hypothesis 2d was also supported, such that being high in social anxiety was associated with lesser willingness to express gratitude, $r(323)=-.12, p<.05$. Hypotheses 2a and 2b were not supported, as there were not significant correlations between gratitude expression and public self-consciousness, or gratitude expression and SR private self-consciousness ($r(323)=-.04, p=.428$ and $r(323)=.02, p=.722$, respectively).

Additionally, gratitude expression was positively and significantly correlated with relationship qualities such as trust, $r(323)=.24, p<.001$, communal strength, $r(322)=.27, p<.001$, commitment, $r(323)=.18, p<.01$, and relationship satisfaction, $r(323)=.27, p<.001$, all of which are attributes of healthy relationships. Gratitude expression was negatively and significantly correlated with quality of alternatives (facet subscale), $r(323)=-.12, p<.05$. Since a high quality of alternatives typically has a negative influence on romantic relationships, this provides evidence that gratitude expression is a beneficial behavior in relationships. Gratitude expression was also significantly correlated with self-esteem, $r(323)=.12, p<.05$. This shows that gratitude expression is positively associated, but still distinct, from other adaptive relationship processes and dispositional factors.

Hypothesized main effects

I also used regression to examine the main effects of trait self-control and the four dispositional self-consciousness factors on willingness to express gratitude. This test is more stringent compared to correlations, and will indicate whether or not the aforementioned results still hold when controlling for other variables. These regression

results are summarized in Table 6. Across all regression analyses there were significant main effects of self-control on gratitude expression, $B=0.08 - 0.11$, $F(1,321)=4.51 - 8.42$, $p=.004 - .034$, 95% C.I.s $\{0.01 - 0.04, 0.16 - 0.19\}$. This provides more support for hypothesis 1a, and reveals that individuals with high dispositional self-control report greater willingness to express gratitude to their romantic partner. The main effect of self-control on gratitude expression was robust and remained significant when controlling for feelings of gratitude and indebtedness.

On the other hand, most of the self-consciousness factors were not significant predictors of gratitude expression. Only ISA private self-consciousness was a significant predictor of gratitude expression, $B=0.17$, $F(1,321)=20.10$, $p<.001$, 95% C.I. = $\{0.09, 0.24\}$. This corresponds with hypothesis 2c, that individuals higher on ISA private self-consciousness are more willing to express gratitude to their romantic partner. These results did not change when controlling for feelings of gratitude and indebtedness (See Tables 10 and 11).

Hypothesized interactions

Interactions between trait self-control by each of the 3 self-consciousness factors on willingness to express gratitude were also examined using regression analyses. These results are also reported in Table 6. While most of the interactions did not reach significance, there was a marginally significant interaction of self-control by social anxiety on gratitude expression, $B=-0.05$, $F(1,320)=2.94$, $p=.087$, 95% C.I. = $\{-0.12, 0.01\}$. Simple slope analyses showed that individuals low in social anxiety were more likely to express gratitude when they are high in dispositional self-control, $B=.15$,

$F(1,321)=7.44, p<.01, 95\% \text{ C.I.} = \{0.04, 0.25\}$, but that there is not a significant effect of self-control on gratitude expression for individuals high in social anxiety, $B=.02, F(1,321)=0.13, p=.723, 95\% \text{ C.I.} = \{-0.09, 0.13\}$ (see Figure 1). These results go counter to what I proposed in hypothesis 3d, in which I proposed that there would be a positive and significant effect of dispositional self-control for individuals high in social anxiety. In sum, hypotheses 3a-d were not supported in Study 1.

The majority of these interaction results stayed the same when controlling for feelings of gratitude or indebtedness. However, the interaction between self-control and social anxiety was still marginally significant when controlling for indebtedness, but no longer reached marginal significance when controlling for feelings of gratitude (see Tables 10 and 11). This interaction should be interpreted with caution, as future studies and analyses are required to see if these results are robust and not simply due to chance.

Correlations between daily gratitude expression, gratitude, and indebtedness

In Study 1 I was also interested in examining the correlations between gratitude expression and feelings of gratitude and indebtedness, which I anticipated to be conceptually related concepts that are not redundant with one another. These results are summarized in Table 7. As anticipated, feeling grateful was positively correlated with gratitude expression, $r(323)=.31, p<.001$. However, indebtedness was not significantly correlated with gratitude expression, $r(322)=-.05, p=.340$. Additionally, though feeling grateful is typically negatively correlated with feeling indebted (Mathews & Green, 2010; Tsang, 2006b; Watkins et al., 2006), this correlation was not replicated in this study,

$r(322)=.01, p=.833$. These correlations suggest that gratitude expression, gratitude emotion, and indebtedness are conceptually distinct.

Comparing gratitude expression correlates with feelings of gratitude and indebtedness correlates

Next, I examined which individual difference and relationship factors were correlated with feeling grateful and feeling indebted. First off, while gratitude expression was positively and significantly correlated with self-control, feelings of gratitude were marginally correlated with self-control, $r(323)=.10, p=.062$ and indebtedness was not significantly correlated with self-control $r(322)=-.02, p=.792$. This provides support for the idea that self-control has a weaker association with feelings of gratitude and indebtedness compared to intentions of actually expressing gratitude to one's romantic partner. This is expected, since experiencing emotions is not considered an effortful process, while expressing emotions does require regulatory effort.

Similar to gratitude expression, gratitude emotion is not significantly correlated with SR private self-consciousness $r(323)=-.08, p=.152$. However, indebtedness is positively and significantly correlated with SR private self-consciousness, $r(322)=.16, p<.01$. These findings replicate previously established correlations in the literature (Mathews & Green, 2010). In contrast, though gratitude expression is significantly correlated with ISA private self-consciousness, feelings of gratitude, $r(323)=.08, p=.129$, and indebtedness, $r(322)=.04, p=.470$, are not significantly correlated with ISA private self-consciousness. This does not correspond with previous studies that reported positive and significant correlations between feelings of gratitude and ISA private self-

consciousness (Mathews & Green, 2010). However, Mathews & Green's finding that indebtedness was not significantly correlated with ISA private self-consciousness (2010) was replicated in this study. Again, similar to gratitude expression, gratitude emotion is not significantly correlated with public self-consciousness, $r(323)=-.05, p=.368$. However, indebtedness is marginally correlated with public self-consciousness, $r(322)=.09, p=.090$. The general pattern of findings in the existing literature was replicated in this study (Mathews & Green, 2010). Finally, though gratitude expression is significantly correlated with social anxiety, gratitude emotion, $r(323)=-.08, p=.160$, and indebtedness, $r(322)=.05, p=.346$, are not. Once again, this does not correspond with previous research findings (Mathews & Green, 2010), in which feelings of gratitude are significantly and negatively correlated with social anxiety and feelings of indebtedness are significantly and positively correlated with social anxiety.

Like gratitude expression, feelings of gratitude were also significantly and positively correlated with relationship qualities such as trust, $r(323)=.53, p<.001$, communal strength, $r(322)=.38, p<.001$, commitment, $r(323)=.42, p<.001$, and relationship satisfaction, $r(323)=.66, p<.001$. Feelings of gratitude were also significantly and negatively correlated with both the facet, $r(323)=-.15, p<.01$, and global, $r(323)=-.13, p<.05$, subscales of the quality of alternatives scale. Indebtedness was also significantly and negatively correlated with trust, $r(322)=-.15, p<.01$, and relationship satisfaction, $r(322)=-.13, p<.05$, and was marginally correlated with the quality of alternatives global subscale, $r(322)=.09, p=.094$. Based on these results, it appears that gratitude was associated with more adaptive relationship qualities than indebtedness. Just like gratitude

expression, feelings of gratitude were also significantly correlated with self-esteem, $r(323)=.16$, $p<.01$, but feelings of indebtedness were not, $r(322)=.00$, $p=.991$. For a complete summary of gratitude and indebtedness correlates, see Tables 8 and 9.

Feelings of Gratitude Interactions

I examined whether there were interactions between dispositional self-control by feelings of gratitude on gratitude expression and dispositional social anxiety by feelings of gratitude on gratitude expression, to see whether or not how grateful people feel changes the impact of self-control and social anxiety on gratitude expression. Neither of these interactions was statistically significant: $B=-0.04$, $F(1,320)=0.86$, $p=.353$, 95% C.I. = $\{-0.11, 0.04\}$ and $B=0.01$, $F(1,320)=0.24$, $p=.624$, 95% C.I. = $\{-0.03, 0.06\}$, respectively.

Gender effects

I also examined whether or not there were gender differences in these effects. Though I did not propose specific hypotheses about gender effects, previous research suggests that women tend to feel more gratitude, express more gratitude, and benefit more from this process than men (Kashdan, Mishra, Breen, & Froh, 2009). Similar patterns arise in this study, with women reporting greater willingness to express gratitude (mean=4.65) than men (mean=4.50), $t(319)=-2.26$, $p=.05$, 95% C.I.s $\{-.29, -.02\}$, and men reporting greater feelings of indebtedness (mean=2.75) than women (mean=2.00), $t(318)=3.51$, $p<.01$. These results are reported in Table 12.

A significant gender by SR private self-consciousness interaction on feelings of gratitude emerged, $B=0.27$, $F(1,320)=4.74$, $p<.05$, 95% C.I. = {0.03, 0.52} (See Table 13 and Figure 2). The simple slopes indicate that for men there is a significant effect of SR private self-consciousness on feelings of gratitude, $B=-0.28$, $F(1,321)=6.44$, $p<.05$, 95% C.I. = {-0.50, -0.06}, revealing that men who report higher levels of this form of self-consciousness tend to report feeling less gratitude toward their romantic partner. In contrast, SR private self-consciousness did not have a significant effect on feelings of gratitude among women, $B=-0.01$, $F(1,321)=0.01$, $p=.921$, 95% C.I. = {-0.13, 0.11}. This finding further informs the previous literature, showing that SR private self-consciousness is another roadblock for men that can dampen their feelings of gratitude.

Brief Discussion of Study 1

The goal of Study 1 was to establish the correlation between self-control and gratitude expression, as well as between self-consciousness and gratitude expression. I found support for hypothesis 1a, that having high self-control is associated with greater willingness to express gratitude. This effect was still significant even after adding additional controls, indicating there is a robust association between self-control and gratitude expression. Additionally, I found that the association between self-control and gratitude expression was stronger than the association between self-control and feeling grateful, further supporting the idea that feeling grateful does not require as much effort as actually expressing gratitude to another person.

I did not find support for hypotheses 2a and 2b, that higher public self-consciousness and higher SR private self-consciousness are associated with less gratitude

expression. I found support for hypothesis 2c and 2d in correlational analyses, with ISA private self-consciousness being positively associated with gratitude expression, and social anxiety being negatively associated with gratitude expression. However, when examining these effects in regression analyses, which control for other variables of interest, the association between ISA private self-consciousness and gratitude expression was still significant, but social anxiety was no longer significantly associated with gratitude expression. Thus, in Study 1, ISA private self-consciousness has a stronger association gratitude expression than social anxiety.

I did not find support for hypotheses 3a-d in Study 1. Though there was a marginally significant interaction between self-control and social anxiety on gratitude expression, the simple slopes were not in the expected direction. Rather than finding a strong positive effect of self-control on gratitude expression among individuals with high social anxiety, I found the opposite. Self-control was associated with more gratitude expression among individuals low in social anxiety, but not for individuals high in social anxiety. This suggests that self-control may not necessarily serve as a buffer for people with maladaptive forms of self-consciousness, but rather helps individuals who are low on measures of maladaptive self-focus to feel even more willing to express gratitude to others. The implications of this pattern of results will be discussed further in the general discussion.

Another important take away from Study 1 is that these correlational results indicate that gratitude expression, while correlated with individual difference variables and positive relationship factors, is an independent construct. Additionally, the

correlation between self-control and gratitude expression is stronger than the correlation between self-control and gratitude emotion, indicating that gratitude expression indeed is more effortful.

Chapter 3: Study 2

The previous study examined the correlation between individual differences in trait self-control and self-consciousness on willingness to express gratitude. The goal of the Study 2 was to extend Study 1 by examining how daily fluctuations in self-control capacity influence willingness to express gratitude, while accounting for trait self-consciousness. This study also examined gratitude expression in the context of close friendships, rather than among romantic partners. I anticipated that on days subjects' self-regulatory resources were depleted, relative to their typical average, they would be less willing to express gratitude to their friends.

Subjects

Two hundred seventy-four individuals were recruited from the University of Rochester psychology undergraduate subject pool. All subjects were at least 18 years of age (age range: 18-27, mean age = 20.17, SD = 1.32). One hundred sixty-two (59%) subjects completed the study in the Fall 2015 semester, and 112 (41%) subjects completed the study in the Spring 2016 semester. There were 162 (59%) women and 112 (41%) men who completed the study. One hundred thirty (47%) subjects were White/Caucasian, 90 (33%) were Asian, and 25 (9%) were Black/African-American. Additionally, 29 (11%) subjects were Hispanic/Latino.

Procedure

Before beginning the 14-day diary study, subjects attended an initial intake session, in which they completed a series of background measures and were given detailed instructions about how to access and complete the daily surveys. All subjects began their 14-nights of surveys on the Monday that followed their intake session. During the intake session, subjects were asked to indicate that they will not be engaging in activities that deviate from their typical routine, such as internships or work-related travel, during their 2 weeks of participation. If subjects did have a conflict, they began their nightly surveys on a Monday that was either two or three weeks from their intake session and in which they did not anticipate out-of-the-ordinary activities. The researchers sent all subjects a reminder text on the Monday that they were scheduled to begin their 14-days of nightly surveys. Two subjects' email addresses were entered incorrectly into the survey email program, resulting in them not receiving their first survey on a Monday night.

Subjects were asked to complete the surveys each night before going to bed. The nightly surveys were estimated to take about 10 minutes to complete. I computed the average time spent on nightly surveys for each participant, to account for between person differences. The average time spent across participants on the nightly surveys was 16 minutes and 36 seconds ($SD = 17$ minutes and 44 seconds); the median was 10 minutes and 52 seconds. Survey links were emailed to subjects each night at 8:00pm. In order to encourage compliance, subjects received a reminder text message and email with the survey link at 12:00am if they had not yet completed the survey. The survey links expired at 5:00am the next day. If subjects did not complete the survey on a given night, the

researchers sent an email the following morning to check-in with the subject. The researchers also emailed subjects after their first 7-days of participation to let them know how many surveys they had completed so far and to thank them for their participation. As an additional incentive, subjects received a lottery ticket for each diary that they complete. If subjects completed 8-10 daily surveys they received 5 extra lottery tickets, if they completed 11-12 daily surveys they received 10 extra lottery tickets, and if they completed 13-14 daily surveys they received 20 extra lottery tickets. When data collection for this study was complete, the lottery tickets were used in a drawing for one \$100 and two \$50 Amazon.com gift cards.

Data Cleaning Procedure

Before conducting analyses, we cleaned the data based on the following criteria: number of nightly surveys completed, number of failed attentive responding checks, time spent on nightly surveys, impossible survey submission times, amount of scales left blank, and amount of stereotyped responding.

First, we checked how many subjects completed 8 or more nightly surveys and 15 (5%) subjects were dropped for not meeting this criterion. Next, we screened for inattentive responding. On each nightly survey, two attention checks were included. The first asked subjects to leave the question blank. If subjects selected one of the answer options instead of leaving the question blank, they were alerted with the following pop-up message:

*We noticed that you are not paying attention to the questions and instructions!
Please make sure to pay attention throughout the rest of the survey.*

The second attention check asked subjects to choose a particular answer choice on a 1-7 Likert scale. The number was randomly generated on each nightly survey to prevent subjects from memorizing which number to select to pass the attention check.

Five (2%) subjects who failed both attention checks on more than half of their nightly surveys were not included in analyses. Additionally, if the sum of failed attention checks was greater than half of the number of nightly surveys the subject completed and they had a high rate of stereotyped responding (see below), the subject was not included in analyses. Five (2%) subjects failed this exclusion criterion.

Another concern was that some subjects may not have spent enough time completing the surveys, and thus did not thoughtfully respond to the questions. Therefore, we examined how much time subjects spent completing the nightly surveys. Among the 245 subjects with a mean duration of less than 30 minutes across all completed surveys, the median was 10:01 minutes, and the standard deviation was 05:33 minutes. We excluded subjects who were more than 1 standard deviation below the median completion time, but only if they also had a high rate of stereotyped responding. Four (1%) subjects failed this inclusion criterion.

Next, we checked for surveys that had been submitted at a time outside of the scheduled completion range. Surveys were programmed to be accessible between 7:30pm through 5:00am each night, and surveys that were submitted after 5:00am were not used in analyses. Thirteen (<1%) surveys were submitted out of the scheduled timeframe.

We also screened for how many scales subjects left blank and how often subjects used stereotyped responding. First, if subjects left more than 1/3 of the scales blank

across all their days of participation, they were excluded. One (<1%) person failed this exclusion criterion. Next, we examined how often subjects used stereotyped responding. We excluded subjects based on the number of times they used a single response item for all items on a given scale that had positively and negatively worded items (meaning that if a subject used the same response on these items, they were most likely not paying attention to the item content). There were 7 such scales. Subjects who used all the same response for at least 4 of these 7 scales were flagged. Additionally, we also tallied how often subjects used the same response across all scales (including scales in which there were no items to be reverse scored). If subjects used the same answer response for all items on at least 8 of the 15 scales, they were flagged. Subjects who were flagged for both criteria on one-third or more of their nightly surveys were excluded from analyses. Fifteen (5%) subjects met this exclusion criterion.

Finally, for participants who were included in the final dataset, we also excluded nightly surveys with a high rate of stereotyped responding. More specifically, if on a given night the subject used the same response for 7 of 7 scales with item reversals and the same response for 15 of 15 total scales included on the nightly surveys, these surveys were excluded. Five (<1%) nightly surveys met this exclusion criteria.

Measures

Since this study was part of a larger collaboration, participants completed many measures that will not be discussed in this manuscript. Below I provide information regarding only measures that were used in my analyses.

Individual Difference Measures

Trait Self-Control. Subjects completed The Trait Self-Control Scale (Tangney et al., 2004) in the intake survey. The same measure was used in Pilot Study 1. The reliability for trait self-control was $\alpha=.82$, $p<.001$.

Self-Consciousness. Subjects completed The Adapted Public and Private Self-Consciousness Scales (Fenigstein et al., 1975) in the intake survey. The same measure was used in Study 1. The reliabilities for the subscales were $\alpha=0.66$ for SR private self-consciousness, $\alpha=0.59$, for ISA private self-consciousness, $\alpha=0.79$, for public self-consciousness, and $\alpha=0.79$ for social anxiety.

Daily Measures

Items on all daily measures were rated on a 1 to 7 scale, ranging from “very little” to “a great deal,” or “definitely not” to “definitely yes,” depending on which set of anchors best suited the item content.

Daily Self-Control Capacity. Twenge and colleagues’ State Self-Control Capacity Scale (SSCCS; Twenge, Muraven, Harter, & Tice, n.d.) was used to assess daily self-control depletion. Subjects responded to the 10-item version, which includes statements such as “Right now, I feel drained,” and “Right now, if I were tempted by something it would be very difficult to resist.” In the scale development paper, the scale had high internal reliability ($\alpha=.95$) and a unifactorial factor structure (Twenge et al., 2004). Twenge and colleagues found that this scale is significantly correlated with vitality, well-being, relationship conflict, health problems, daily demands, sleep deprivation, and anxiety, which establishes scale validity. In developing the SSCCS,

Twenge and colleagues also found that after resisting tempting food or squeezing a handgrip, participants had lower scores on the SSCCS, indicating that after a behavioral measure of depletion the scale effectively captures a decrease in self-control resources. In the current study, the scale reliability for state self-control capacity across the 14 diary days, computed separately on each day and then averaged, was $\alpha=.89$, ranging from $\alpha=.87$ to $\alpha=.91$.

Daily Stress. The item “Compared to other days at college, how stressful was today?” was included to assess daily variations in stress. Daily stress was used as a control variable.

Daily Social Anxiety. In order to assess daily self-consciousness, a daily social anxiety measures was administered. Subjects responded to the following items: “Today, I felt nervous, even in casual get-togethers,” “Today, I felt comfortable with other people,” “Today, talking to other people made me feel anxious and uncomfortable,” “Today, I felt shy in social interactions,” and “Today, I felt relaxed around other people.” The average scale reliability for social anxiety across the 14 diary days was $\alpha=.83$, ranging from $\alpha=.79$ to $\alpha=.86$.

Feelings of Gratitude and Indebtedness. In order to assess whether subjects felt grateful on a given day, a daily emotion measure was administered. The measure used in Study 1 was also used in Study 2 (Algoe et al., 2010; Tsang, 2006b), but the instructions were adapted to fit the daily diary format. The following prompt was given to subjects:

“People feel many different things as a result of others’ actions on any given day or at any given time. Using a 0 (not at all) to 6 (very much) scale, please indicate

how each item describes how you feel as a result of your friends' actions toward you throughout the day.”

Like in Study 1, gratitude was assessed with the items grateful, thankful, and appreciative, and indebtedness was assessed with the items indebted, and obligated. The average reliability for feelings of gratitude across the 14 diary days was $\alpha=.95$, ranging from $\alpha=.94$ to $\alpha=.97$. The average reliability for feelings of indebtedness across the 14 diary days was $\alpha=.77$, ranging from $\alpha=.66$ to $\alpha=.87$.

Gratitude Expression. The items used in Pilot Study 2 were modified for a daily assessment format. Subjects responded to the following items: “Today, I expressed my appreciation for the things that my friends did for me,” “Today, I let my friends know that I value them,” and “Today, when my friends did something nice for me I acknowledged it.” The average reliability for gratitude expression across the 14 diary days was $\alpha=.92$, ranging from $\alpha=.89$ to $\alpha=.95$.

Study 2: Results

Descriptive Statistics

First, I examined how frequently subjects expressed gratitude, as well as how grateful and indebted they felt during their 2-weeks of participation. On average, subjects reported their gratitude expression was 4.36 ($sd = 1.23$) on a 1 to 7 scale, slightly above the midpoint of the scale. One hundred and fifty (65%) subjects reported that they expressed some amount of gratitude (>1) on each nightly survey they completed. Additionally, there was not an association between diary day and amount of gratitude expression reported, $B=0.003$, $t(2783)=0.40$, $p=.686$, 95% C.I.s $\{-0.01, 0.02\}$, meaning

there was not a linear increase or decrease in gratitude expression during the two weeks of surveys (see Figure 3).

Next, I examined how grateful and indebted subjects reported feeling. On average, subjects reported their daily feelings of gratitude were 3.42 ($sd = 1.26$) on a 0 to 6 scale, also slightly above the midpoint of the scale. One hundred and fifty nine (69%) participants reported that they felt some amount of gratitude (>0) on each nightly survey. There was not an association between diary day and amount of gratitude emotion reported $B=0.01$, $t(2796)=1.56$, $p=.119$, 95% C.I.s $\{-0.003, 0.03\}$ (see Figure 4).

Finally, on average subjects reported their daily feelings of indebtedness was 1.51 ($sd = 1.25$) on a 0 to 6 scale. Also, 67 (29%) participants reported that they felt some amount of indebtedness (>0) on each nightly survey they completed. Compared to gratitude, indebtedness was experienced less frequently. Additionally, there was an association between diary day and amount of indebtedness emotion reported, $B=-0.01$, $t(2795)=-2.21$, $p=.027$, 95% C.I.s $\{-0.03, -0.002\}$, indicating that participants reported less indebtedness as the diary study progressed (see Figure 5).

Correlations between daily gratitude expression, gratitude, and indebtedness

I also examined the correlations between gratitude expression, feelings of gratitude, and feelings of indebtedness on each diary day. As expected, there is a strong positive correlation between feeling grateful and expressing gratitude across diary days, ranging from .49 - .64. It will be important to control for feeling grateful in analyses testing the hypothesized effects of self-control and self-consciousness on gratitude expression, to ensure that these effects are robust. In comparison, the correlation between

gratitude expression and feeling indebted was weaker, $r = .09 - .33$. However, given these positive correlations, it will still be important to control for feeling indebted in subsequent analyses. Lastly, feelings of gratitude and indebtedness were positively correlated with each other, $r = .23 - .39$. Once again, this correlation contradicts the previous gratitude literature, which finds that gratitude and indebtedness are negatively correlated with one another (e.g., Mathews & Green, 2010; Tsang, 2006; Watkins, Scheer, Ovnicek, & Kolts, 2006).

Hypothesized main effects

Next, I used HLM to examine if daily fluctuations in self-control and social anxiety predicted self-reported daily gratitude expression. In all subsequent multilevel models I used full maximum likelihood estimation.

The level-1 equation for the model assessing my hypothesized main effects was:

$$\text{Gratitude Expression} = \beta_{0j} + \beta_{1j}(\text{DAY}) + \beta_{2j}(\text{State Self-Control}) + \beta_{3j}(\text{Daily Stress}) + \beta_{4j}(\text{Daily Social Anxiety}) + \varepsilon_{ij}$$

where β_{1j} controls for the day of participation, β_{2j} assesses daily fluctuations in state self-control, β_{3j} controls for daily fluctuations in stress, and β_{4j} assesses daily fluctuations in social anxiety. State self-control, daily stress, and daily social anxiety were all person-centered, meaning that these coefficients were estimated in terms of each person's daily deviation from their own average.

The level-2 equation models between-person variables, as well as between-person variation in the level-1 equation coefficients:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Dispositional Self-Control}) + \gamma_{02}(\text{SR Private Self-Consciousness}) + \gamma_{03}(\text{ISA Private Self-Consciousness}) + \gamma_{04}(\text{Public Self-Consciousness}) + \gamma_{05}(\text{Social Anxiety}) + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

where γ_{01} is the slope for the main effect of dispositional self-control and γ_{02} through γ_{05} are the slopes for dispositional SR private self-consciousness, ISA private self-consciousness, public self-consciousness, and social anxiety on daily gratitude expression. These variables are not centered, meaning the coefficients are in terms of scale.

The results of this model are summarized in Table 14. There was a significant main effect of daily self-control, indicating that on days participants reported higher state self-control they were also likely to report more gratitude expression, $B=0.12$, $t(2755)=3.81$, $p<.001$, 95% C.I.s {0.06, 0.18}. This provides support for hypothesis 1b. Also, there was a significant main effect of daily social anxiety, indicating that on days participants reported higher social anxiety they were also likely to report less gratitude expression, $B=-0.28$, $t(2755)=-6.07$, $p<.001$, 95% C.I.s {-0.38, -0.18}. This provides support for hypothesis 2d. Diary day and daily stress, which were included as control variables, were not significant predictors of daily gratitude expression.

Similarly, there was a significant main effect of dispositional social anxiety, such that individuals with higher social anxiety ratings reported less daily gratitude expression, $B = -0.22$, $t(218) = -2.25$, $p = .025$, 95% C.I.s $\{-0.42, -0.02\}$, which also supports hypothesis 2d. However, there were not significant main effects of dispositional self-control, SR private self-consciousness, ISA private self-consciousness, or public self-consciousness on daily gratitude expression. These null findings do not support hypotheses 2a-2c.

Hypothesized main effects with additional controls

To test how robust these main effects were, I ran the same model adding the following additional controls. First, I controlled for daily feelings of gratitude and indebtedness, since they are positively correlated with gratitude expression and could potentially wash out the predicted effects of self-control and self-consciousness. In this model, there was a significant main effect of feeling grateful on gratitude expression, but there was not a significant main effect of feeling indebted on gratitude expression. There were still significant main effects of dispositional social anxiety and daily social anxiety. However, there was no longer a significant main effect of daily self-control on gratitude expression. See Table 15 for a summary of this model.

In the next model, I controlled for daily feelings of gratitude and indebtedness, as well as gratitude expression on the previous day. I controlled for gratitude expression on the previous day, because someone who expressed gratitude yesterday might also be likely to express gratitude today. In fact, I did find a significant main effect of gratitude expression on the previous day, showing that if participants reported high gratitude expression yesterday they were also likely to report high gratitude expression today,

$B=0.06$, $t(2502)=2.50$, $p=.013$, 95% C.I.s {0.02, 0.10}. However, there were still significant main effects of dispositional social anxiety, daily social anxiety, and feelings of gratitude on gratitude expression, even after adding this additional control variable. See Table 16 for a summary of this model.

In sum, even after adding controls, dispositional and daily social anxiety were robust predictors of gratitude expression. People with more social anxiety were less likely to report expressing gratitude, which supports hypothesis 2d. I also found some evidence supporting hypothesis 1a, which predicted that higher self-control would be associated with more gratitude expression. However, the effect of daily self-control no longer reached significance when controlling for how much gratitude people felt.

Hypothesized dispositional self-control by self-consciousness interactions

Next, I tested for interactions between dispositional self-control and each of the self-consciousness factors on gratitude expression.

The level-1 equation:

$$\text{Gratitude Expression} = \beta_{0j} + \beta_{1j}(\text{DAY}) + \beta_{2j}(\text{State Self-Control}) + \beta_{3j}(\text{Daily Stress}) + \beta_{4j}(\text{Daily Social Anxiety}) + \epsilon_{ij}$$

The level-2 equation:

$$\begin{aligned} \beta_{0j} = & \gamma_{00} + \gamma_{01}(\text{Dispositional Self-Control}) + \gamma_{02}(\text{SR Private Self-Consciousness}) + \\ & \gamma_{03}(\text{ISA Private Self-Consciousness}) + \gamma_{04}(\text{Public Self-Consciousness}) + \gamma_{05}(\text{Social Anxiety}) + \\ & \gamma_{06}(\text{Dispositional Self-Control by SR Private Self-Consciousness}) + \\ & \gamma_{07}(\text{Dispositional Self-Control by ISA Private Self-Consciousness}) + \gamma_{08}(\text{Dispositional} \end{aligned}$$

Self-Control by Public Self-Consciousness) + γ_{09} (Dispositional Self-Control by Social Anxiety) + u_{0j}

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

None of the predicted interactions were significant. This does not provide support for hypotheses 3a-3d. In addition, when controlling for daily feelings of gratitude and indebtedness, and daily feelings of gratitude, indebtedness, and gratitude expression on the previous day, the interaction results did not change, and none of the proposed interactions were statistically significant. See Tables 17-19 for summaries of these models.

Hypothesized state self-control by self-consciousness interactions

Finally, I tested for interactions between state self-control and each of the self-consciousness factors on gratitude expression using the following model.

Level-1 equation:

$$\text{Gratitude Expression} = \beta_{0j} + \beta_{1j}(\text{DAY}) + \beta_{2j}(\text{State Self-Control}) + \beta_{3j}(\text{Daily Stress}) + \beta_{4j}(\text{Daily Social Anxiety}) + \epsilon_{ij}$$

Level-2 equation:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Dispositional Self-Control}) + \gamma_{02}(\text{SR Private Self-Consciousness}) + \gamma_{03}(\text{ISA Private Self-Consciousness}) + \gamma_{04}(\text{Public Self-Consciousness}) + \gamma_{05}(\text{Social Anxiety}) + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20} + \gamma_{21}(\text{SR Private Self-Consciousness}) + \gamma_{22}(\text{ISA Private Self-Consciousness}) + \gamma_{23}(\text{Public Self-Consciousness}) + \gamma_{24}(\text{Social Anxiety})$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

There was a significant interaction between ISA private self-consciousness and daily self-control, $B=0.11$, $t(2751)=2.00$, $p=.045$, 95% C.I.s {0.01, 0.21}. None of the other hypothesized interactions reached statistical significance. When controlling for daily feelings of gratitude and indebtedness, and daily feelings of gratitude, indebtedness, and gratitude expression on the previous day, the results changed very little. The ISA private self-consciousness by daily self-control interaction was marginally significant: $B=0.09$, $t(2745)=1.87$, $p=.061$, 95% C.I.s {-0.01, 0.19} when controlling for daily feelings of gratitude and indebtedness and $B=0.09$, $t(2498)=1.66$, $p=.097$, 95% C.I.s {-0.01, 0.19} when controlling for feelings of gratitude and indebtedness, and gratitude expression on the previous day. No other significant interactions emerged in these models, meaning I did not find support for hypotheses 4a, 4b, or 4d. See Tables 20-22 for summaries of these models.

I examined the simple slopes of the ISA private self-consciousness by daily self-control interaction and removed all other variables in the model based on Preacher,

Curran, and Bauer's HLM simple slope technique (2003). When examining the simple slope effects in isolation, I found a significant main effect of daily self-control on daily gratitude expression for individuals who were one standard deviation below the mean on ISA private self-consciousness, $B = 0.10$, $t(2780) = 2.18$, $p = .029$, 95% C.I.s {0.01, 0.19}, as well as a significant main effect of daily self-control on gratitude expression of individuals who were one standard deviation above the mean on ISA private self-consciousness, $B = 0.23$, $t(2780) = 5.44$, $p < .001$, 95% C.I.s {0.15, 0.31} (see Figure 6). Both simple slopes are in the same direction, indicating that on days participants had high state self-control they were more likely to report expressing gratitude. However, the slope is slightly steeper for individuals high on ISA private self-consciousness, which supports hypothesis 4c.

Daily social anxiety by dispositional and state self-control interactions

Though I did not explicitly hypothesize interactions between daily fluctuations in social anxiety and self-control, I tested the following post-hoc model examining the daily social anxiety by dispositional self-control and daily social anxiety by state self-control interactions.

Level-1 equation:

$$\text{Gratitude Expression} = \beta_{0j} + \beta_{1j}(\text{DAY}) + \beta_{2j}(\text{State Self-Control}) + \beta_{3j}(\text{Daily Stress}) + \beta_{4j}(\text{Daily Social Anxiety}) + \beta_{5j}(\text{State Self-Control by Daily Social Anxiety}) + \varepsilon_{ij}$$

Level-2 equation:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Dispositional Self-Control}) + \gamma_{02}(\text{SR Private Self-Consciousness}) + \gamma_{03}(\text{ISA Private Self-Consciousness}) + \gamma_{04}(\text{Public Self-Consciousness}) + \gamma_{05}(\text{Social Anxiety}) + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20} + \gamma_{21}(\text{SR Private Self-Consciousness}) + \gamma_{22}(\text{ISA Private Self-Consciousness}) + \gamma_{23}(\text{Public Self-Consciousness}) + \gamma_{24}(\text{Social Anxiety})$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40} + \gamma_{41}(\text{Dispositional Self-Control})$$

$$\beta_{5j} = \gamma_{50}$$

Neither the daily social anxiety by dispositional self-control interaction, $B = -0.05$, $t(2749) = 0.69$, $p = .492$, 95% C.I.s $\{-0.19, 0.09\}$, nor the daily social anxiety by state self-control interaction, $B = -0.01$, $t(2749) = 0.78$, $p = .435$, 95% C.I.s $\{-0.05, 0.03\}$, reached statistical significance. Thus I found no support for the possibility that the association between daily fluctuations in social anxiety and gratitude expression differs based on whether a person has high or low self-control. See Table 23 for a summary of these results.

Parallel analyses with feelings of gratitude as outcome

In order to assess whether or not the effects of self-control and self-consciousness were unique to gratitude expression, I ran the same models using feelings of gratitude as the outcome variable instead. Since feeling grateful should not require as much effort, I anticipate that though self-consciousness may have a similar relationship with feeling

grateful as it does with expressing gratitude, the relationship between self-control and feeling grateful should be weaker than the relationship between self-control and gratitude expression.

First, I examined the main effects of self-control and self-consciousness on feeling grateful. For comparison, see Table 14 for a summary of these effects on gratitude expression and Table 24 for a summary of these effects on feeling grateful. I found that there was a marginally significant main effect of dispositional self-control on feeling grateful, $B=0.29$, $t(218)=1.96$, $p=.051$, 95% C.I.s $\{-0.01, 0.59\}$, but not for gratitude expression $B=0.17$, $t(218)=1.19$, $p=.236$, 95% C.I.s $\{-0.11, 0.45\}$. Higher dispositional self-control was associated with feeling more grateful towards close others. Similarly, there was a significant main effect of state self-control on both feeling grateful, $B=0.24$, $t(2759)=6.68$, $p<.001$, 95% C.I.s $\{0.16, 0.32\}$, and gratitude expression, $B=0.12$, $t(2755)=3.81$, $p<.001$, 95% C.I.s $\{0.06, 0.18\}$, such that having high state self-control was associated with feeling more grateful and expressing more gratitude. However, unlike in Study 1, in Study 2 the effects of self-control on feeling grateful were of greater magnitude than the effects of self-control on expressing gratitude. Though I did not anticipate that the association between dispositional and state self-control with feeling grateful to be as strong, it does make sense that self-control is associated with feeling grateful. Individuals high on self-control are most likely more attentive to social cues and what is going on around them, and therefore would be more likely to be aware that something happened to feel grateful about. Additionally, self-control tends to be associated with positive outcomes in general (Tangney, Baumeister, Boone, 2004), and

since feeling grateful is associated with increased well-being (Emmons & Crumpler, 2000; Emmons et al., 2003) it is not surprising it would have a positive association with self-control.

There was a significant main effect of SR private self-consciousness on feeling grateful, $B=0.26$, $t(218)=2.25$, $p=.025$, 95% C.I.s {0.02, 0.50}, but not on gratitude expression, $B=0.13$, $t(218)=1.17$, $p=.244$, 95% C.I.s {-0.09, 0.35}. Being higher on SR private self-consciousness was associated with feeling more grateful towards others. This finding was unexpected, since in the previous literature SR private self-consciousness was not associated with feeling grateful and instead was associated with greater feelings of indebtedness (Mathews & Green, 2010). One reason for this non-replication might be that Mathews and Green (2010) used different measures of gratitude and indebtedness than I did in my studies. Additionally, in this research the reliability statistics for the self-consciousness factors were stronger than those in Mathews and Green's research (2010), meaning there was a greater chance of detecting this effect in the present research than there was in the previous research.

There were not significant main effects of ISA private self-consciousness or public self-consciousness on either feeling grateful or expressing gratitude. Additionally, while there was not a significant main effect of social anxiety on feeling grateful, $B=-0.09$, $t(218)=-0.95$, $p=.345$, 95% C.I.s {-0.29, 0.11}, there was a significant main effect of social anxiety on gratitude expression, $B=-0.22$, $t(218)=-2.25$, $p=.025$, 95% C.I.s {-0.42, -0.02}. However, there was a significant effect of daily social anxiety on feeling grateful,

$B = -0.17$, $t(2759) = -4.08$, $p < .001$, 95% C.I.s $\{-0.25, -0.09\}$, and expressing gratitude, $B = 0.28$, $t(2755) = -6.07$, $p < .001$, 95% C.I.s $\{-0.38, -0.18\}$. Higher daily social anxiety was associated with both feeling less grateful for close others and expressing less gratitude to them.

I also examined the interactions between dispositional self-control by self-consciousness on feelings of gratitude (see Table 25) and state self-control by self-consciousness on feelings of gratitude (see Table 26). No statistically significant interactions emerged in either of these models.

Feelings of gratitude interactions

I examined whether there were interactions between dispositional and daily self-control by feelings of gratitude on gratitude expression, as well as dispositional and daily social anxiety by feelings of gratitude on gratitude expression, to see whether or not how grateful people feel changes the impact that self-control and social anxiety have on gratitude expression. None of these interactions reached statistical significance.

Gender effects

There was a significant main effect of gender on gratitude expression, $B = 0.42$, $t(217) = 2.47$, $p = .015$, 95% C.I.s $\{0.08, 0.76\}$, such that women expressed more gratitude on average than men. There was a marginally significant gender by dispositional self-control interaction, $B = 0.46$, $t(212) = 1.67$, $p = .096$, 95% C.I.s $\{-0.09, 1.01\}$. When examining the simple slopes, for men there was not a significant effect of dispositional self-control on gratitude expression, $B = 0.02$, $t(220) = 0.11$, $p = .917$, 95% C.I.s $\{-0.38,$

0.42}, but for women there was a positive association between self-control and gratitude expression, $B = 0.39$, $t(220) = 2.36$, $p = .019$, 95% C.I.s {0.06, 0.72}, indicating that women with higher self-control were more likely to report expressing gratitude (see Figure 7). There was not a significant interaction between gender and state self-control on gratitude expression, nor were there significant interactions between gender and any of the self-consciousness factors.

Cultural differences

There was a significant difference between White and Asian participants in daily gratitude expression, with White participants (mean = 4.62) reporting more gratitude expression than Asian participants (mean = 4.18), $B = 0.22$, $t(179) = 2.52$, $p = .013$, 95% C.I.s {0.04, 0.40}. White participants also reported higher feelings of gratitude, $B = 0.34$, $t(179) = 3.67$, $p = .001$, 95% C.I.s {0.16, 0.52}, and lower feelings of indebtedness, $B = -0.25$, $t(179) = -2.56$, $p = .012$, 95% C.I.s {-0.45, -0.05}, (means of 3.72 and 1.34, respectively), compared to Asian participants (means of 3.05 and 1.84, respectively). These group differences correspond with the previous literature on cultural differences in gratitude and indebtedness. These cultural differences are similar to those found in the extant literature (Kotani, 2002). See Table 27 for a summary of these results.

I also examined whether or not culture moderated the effects of self-control and social anxiety on gratitude expression. There was a significant interaction between culture and daily self-control on gratitude expression (see Table 28 and Figure 8). For White participants on days when daily self-control was high, they were also more likely

to report more gratitude expression, $B=0.26$, $t(2242)=5.28$, $p<.001$, 95% C.I.s {0.16, 0.35}, but there was not a significant main effect of daily self-control on gratitude expression among Asian participants, $B=0.07$, $t(2242)=1.46$, $p=.146$, 95% C.I.s {-0.02, 0.16}. However, there was not a significant interaction between culture and dispositional self-control (see Table 29). In addition, there was a significant interaction between culture and daily feelings of gratitude on daily gratitude expression (see Table 30 and Figure 9) such that feeling more grateful was associated with more gratitude expression among both White, $B=0.51$, $t(2237)=13.41$, $p<.001$, 95% C.I.s {0.44, 0.59}, and Asian, $B=0.34$, $t(2237)=10.01$, $p<.001$, 95% C.I.s {0.27, 0.39}, participants but the effect was stronger among White participants.

This moderation by culture corresponds with the previous literature examining cultural differences. Individuals from Western cultures tend to experience their emotions for longer periods of time and more intensely compared to individuals from Eastern cultures (Markus & Kitayama, 1991; Matsumoto, Kasri, & Kookan, 1999). This means that compared to Asian participants, White participants who report feeling grateful are more likely to have a strong enough emotional experience to be aware of it and potentially express it, making it easier in general to detect whether or not variables, like self-control, have an effect on gratitude expression. It also follows that the association between feeling grateful and expressing gratitude is stronger among White participants than among Asian participants, since White participants are more likely to experience the emotion strongly and long enough to detect it and ultimately express gratitude to others.

Also, individuals from Western cultures are more likely to self-disclose to others than those from Eastern cultures (Chen, 1995). If gratitude expression is a form of self-disclosure, White participants will be more inclined than Asian participants to express gratitude to others, which again will make it easier to detect the effects of self-control on gratitude expression. Furthermore, in Eastern cultures, there is much weaker differentiation between gratitude and indebtedness, and gratitude is often expressed by emphasizing that one has burdened the benefactor (Kotani, 2002). If individuals in Eastern cultures are more selective with self-disclosure due to concerns about how their self-disclosure can potentially influence their social network (Chen, 1995; Markus & Kitayama, 1991), and events that elicit gratitude often involve inconveniencing or burdening another individual, they may be less likely to express gratitude in the same way that Westerners do (Kotani, 2002). Feeling grateful and having high self-control may not be relevant in predicting gratitude expression among Asian participants, since not only are their emotional experiences likely to be weaker and short-lived compared to Westerners (Markus & Kitayama, 1991; Matsumoto, Kasri, & Kookan, 1999), but the experience of gratitude is intertwined with feelings of indebtedness (Kotani, 2002). While gratitude is considered an other-focused emotion while indebtedness is considered a self-focused one (Algoe et al., 2010), these lines are blurred in the experience of gratitude among Asians (Kotani, 2002), which dovetails with the interdependent construal in which there are great deals of overlap between others and the self. Ultimately, both feeling grateful and gratitude expression are likely to function differently in Western and Eastern

cultures as a result of this blend of both positive and negative valence as well as the blend of self and others in one's self-construal.

Brief Discussion of Study 2

The goal of study 2 was to see if daily fluctuations in self-control were associated with gratitude expression, and how dispositional self-consciousness interacts with these effects.

Though I did not find support for hypothesis 1a, that higher dispositional self-control would be associated with gratitude expression, I found support for hypothesis 1b, in which I predicted that when state self-control is low people are less likely to express gratitude. However, this effect did not remain statistically significant when I added additional control variables to the model.

I did not find support for hypotheses 2a-2c, that higher public self-consciousness and higher SR private self-consciousness are associated with less gratitude expression, and that higher ISA private self-consciousness is associated with more gratitude expression. I did find significant effects of both dispositional and daily social anxiety, showing that higher social anxiety was associated with less gratitude expression. This result supports hypothesis 2d. These effects were robust, and remained statistically significant when I added additional control variables to the model.

Also, I did not find support for hypothesis set 3, which predicted interactions between dispositional self-control and self-consciousness on gratitude expression. When testing hypothesis set 4, which predicted interactions between state self-control and self-consciousness, I found a significant ISA private self-consciousness by daily state self-

control on gratitude expression. I found that the simple slopes of self-control on gratitude expression were positive and significant for participants who were both high and low on ISA private self-consciousness. Though dispositional self-control was consistently associated with more gratitude expression, the association was stronger for individuals who were higher on ISA private self-consciousness, which supports hypothesis 4c.

I also found a significant gender difference in gratitude expression, indicating that women reported expressing more gratitude than men, which is consistent with prior research (Kashdan, Mishra, Breen, & Froh, 2009). Additionally, I also found a significant interaction between gender and dispositional self-control on daily gratitude expression. While having high self-control was associated with more gratitude expression among women, there was not a significant effect of self-control on gratitude expression for men.

All in all, I found some support for my predictions. Among all the self-consciousness factors included in this study, social anxiety seems to be the strongest and most robust predictor of daily gratitude expression. Individuals who are dispositionally high on social anxiety were less likely to report expressing gratitude. Additionally, on days participants reported feeling more anxious and nervous around others they also reported lower levels of gratitude expression. Thus, social anxiety is an influential form of self-focus associated with diminished gratitude expression. Also, my hypotheses regarding self-control are somewhat supported, with high daily self-control being associated with greater gratitude expression. Though this effect does not remain significant when adding additional controls, dispositional self-control is a significant predictor in the expected direction for women. Though my predictions regarding self-

control are not strongly supported, self-control still seems to play an explanatory role in understanding when people are most likely to express gratitude to others.

Chapter 4: Study 3

The goal of Study 3 is to build upon the correlational analyses of Studies 1 and 2 by looking at the causal effect of self-regulation on gratitude expression. This will be done by experimentally manipulating ego-depletion. Study 3 will also use a different measure of gratitude expression, in which subjects will all respond to the same gratitude inducing scenario in a laboratory setting. To induce gratitude, a paradigm in which subjects are relieved from having to engage in an undesirable task will be used (Bartlett & DeSteno, 2006; MacKenzie, Vohs, & Baumeister, 2014). This design will allow for examination of whether self-regulatory depletion results in differences in behavioral gratitude expression.

Subjects

G*Power was used to determine the sample size needed to attain acceptable power (.80). For an effect size of f of 0.10, the G*Power calculation estimated that 72 subjects are needed in each experimental condition (i.e., 144 subjects in total). One hundred thirty-nine individuals were recruited from the University of Rochester psychology undergraduate subject pool. One subject did not give permission for their data to be used. Of the remaining 138 subjects, all were at least 18 years of age (age range: 18-30, mean age = 20.24, SD = 1.62). There were 114 (83%) women and 24 (17%) men who completed the study. Sixty-six (48%) subjects were White/Caucasian, 45

(33%) were Asian, 19 (14%) were Black/African-American, and 8 (6%) identified as another race. Additionally, 11 (8%) subjects were Hispanic/Latino.

Procedure

Subjects completed a preliminary survey online before coming to the lab. This step was implemented to reduce concerns that the content of the survey measures would influence how subjects react to the experimental procedures. One hundred thirty-eight individuals completed the preliminary survey, as requested. One subject submitted a partially complete preliminary survey, and did not provide responses to any of the scales.

Two experimenters and one confederate acting as another study subject were involved in conducting Study 3. The first experimenter had the subject and confederate complete an ego depletion task. The ego depletion task that was used is specifically relevant to the depletion of working memory capacity (Murray et al., 2011; Schmeichel, 2007). Subjects in the control condition were asked to write a story about their most recent trip, and were not given additional instructions or limitations (Schmeichel, 2007). In the depletion condition, subjects were given the same instructions, but were told they cannot use the letters A or N, high-frequency letters, anywhere in their story (Murray et al., 2011; Schmeichel, 2007). The subject and confederate were asked to write as much as possible by hand (Schmeichel, 2007). The first experimenter stopped them after 6 minutes of writing.

After completing the ego-depletion task, the first experimenter told the subject and confederate that next they would complete a different task for a second study in another room down the hall. The first experimenter walked both the subject and

confederate to the other lab room and explained that a different experimenter would give them instructions about the next task. The second experimenter greeted the subject and confederate, and then gave the following instructions, which describe the Trier Social Stress Test (TSST; Kirschbaum, Pirke, & Hellhammer, 1993; Kudielka, Hellhammer, & Kirschbaum, 2007):

For this part of the SONA session, we would like you to talk about your feelings and experiences in math classes. Specifically, you will be asked to describe and explain your mathematical abilities and experiences.

In addition to me, there will also be two evaluators who will later review the quality of your speech about your math-related feelings and experiences. The evaluators will not be judging your math experience or math knowledge, but rather they will assess your ability to successfully and clearly present your thoughts and ideas.

To provide more detail, you will be giving a speech for 5 minutes about your feelings and experiences in math-related courses and your assessment of your mathematical abilities. For example, you can talk about your feelings you experience before taking difficult math exams, study habits that you have used specific to math courses, and/or breadth of your math knowledge. We will make a video recording of your speech that will be reviewed by researchers involved in the study. The evaluators will watch this video and track your verbal responses and code your non-verbal behavior. When you deliver your speech, please sit up straight and look at video camera. It is important that you try to be as thorough as possible talking for the full 5 minutes, without any pauses for more than a few seconds.

You can talk about any math-related experiences or feelings, but you must talk about both by providing at least one concrete experience and one subjective feeling. You may then choose to focus most heavily on one or two specific experiences, feelings, or abilities if you wish.

I will let you know when the 5 minutes are over. During your speech, please try to demonstrate that you have thought about the topic and have an idea of what your experiences and feelings are. The evaluators will evaluate you on the following categories.

- 1. Well-thought out statements that thoroughly describe your opinions*
- 2. Ability to communicate through verbal and non-verbal channels*
- 3. Eye contact*

4. *Positive attitude*

Each of you will have 3 minutes to prepare your thoughts before starting the speech and think about what you want to say. We'd like you to prepare mentally without taking any notes. Please prepare yourself well so that you can talk about your experiences and feelings for several minutes without interruption since this will make the best impression.

In this lab, a video camera was set up, to increase the believability of this manipulation. After giving these instructions to the subject and confederate, the second experimenter checked his/her clipboard to see in which order the subject and confederate would complete the task. He/she then expressed some surprise and said, "Hmm, it turns out that I only need one person to complete this task today instead of two. So, which one of you is willing to do this task for me today?" The confederate volunteered, and said "I can do the task, I don't mind." The entire time the subject and confederate were in this second lab room, an audio recorder was used to record whether or not the participant expressed gratitude when the confederate volunteered to complete this stressful task.

After the confederate volunteered, the second experimenter then said, "OK, great! I need to grab a consent form from the other room. I'll be back in a second." The experimenter then left the room for about 30 seconds. This gave the subject and the confederate a brief amount of time alone, which provided another opportunity for the subject to express gratitude to the confederate. The opportunity for a one-on-one interaction between the subject and confederate may be important, because in Pilot Study 2 some individuals noted that people may be less willing to express gratitude when they think they are in public or do not have a private moment. This should help account for the potential confound of the experimenter's presence. During this time the audio recorder

was still on. When the experimenter returned, he/she took the subject back to the lab room they started in and asked the confederate to begin preparing their speech. In actuality, no one completed the TSST. Subjects were led to believe that this task was part of the study in order to induce gratitude when the confederate volunteered to do the task and relieved them of having to give a stressful speech.

Once the subject returned to the original lab room, the first experimenter asked the subject to complete a final questionnaire, which contained questions about their current feelings and questions about their impressions of the confederate along with distractor questions. Once the subject completed this set of questionnaires, they were thoroughly debriefed. During the debriefing portion of the lab experiment, the experimenter asked subjects the following questions to probe for suspicions:

- 1. What did you think the purpose or goal of the study was?*
- 2. Do you think the first task might have influenced your behavior in the next activity?*
- 3. Do you think anything was suspicious about this study?*

Audio Coding Procedure

The audio recordings from the interactions between the second experimenter, the confederate, and the subject were coded to see if the subject expressed gratitude when the confederate volunteered to do the stressful speech task. The audio recordings were first transcribed, in order to protect the subjects' privacy, and the audio transcriptions were then coded. Three coders reviewed the audio transcriptions and indicated whether or not the subject expressed gratitude, indebtedness, or other positive feelings to the confederate. The codes for gratitude and indebtedness expression were binary (i.e., the participant either expressed or did not express one of these sentiments), while the other

positive feelings code was an open-ended qualitative code. The coding scheme is provided under Appendix D. The coders' ratings had excellent inter-rater reliability, with $\alpha=0.95$, $p<.001$, for gratitude expression and $\alpha=0.95$, $ICC=0.86$, $p<.001$, for indebtedness expression. The code assigned by the majority of coders was used to represent gratitude and indebtedness expression.

Measures

State Self-Control Capacity. The same measure from Study 1 was used. The reliability for state self-control capacity was $\alpha=0.88$, $p<.001$.

Feelings of Gratitude and Indebtedness. The daily diary measure used in Study 2 was adapted to ask subjects about how they feel toward the "other participant," who was a confederate. Subjects were asked to what extent they currently felt each of the following emotions: grateful, thankful, appreciative, indebted, and obligated, and will use a 0 (not at all) to 6 (very much) scale. The reliability for gratitude was $\alpha=0.93$, $p<.001$, and the reliability for indebtedness was $\alpha=0.57$, $p<.001$.

Motivational Focus. Since the intention of the giver influences how much gratitude people experience (Tsang, 2006a), I measured motivational focus as a control variable. Subjects were asked to rate the confederate's motivation for volunteering to complete the TSST on a 1 (Very concerned about me) to 7 (Motivated by selfish reasons) scale. The mean score on this item was 3.81 ($SD=1.20$), which is nearly the midpoint of the scale. Subjects tended not to think the other participant did the favor out of either altruistic or selfish motivations, with 63 (55%) subjects selecting the neutral midpoint of the scale. Also, 81% of the sample selected either 4 or lower on the Likert scale,

indicating that most subjects did not believe the confederate was motivated by selfish reasons.

Cost and Value of the Favor. Subjects were asked how much of a cost the confederate incurred for doing this favor, and how much they personally valued the favor. These items were on a 1 (very little) to 7 (very much) scale. The mean score for cost of the favor was 3.22 ($SD=1.53$), which is close to the midpoint of the scale. Fifty-seven percent of subjects selected either 3 or lower on the scale, indicating that most subjects believed the confederate incurred relatively low personal costs by volunteering to do the speech task. On the other hand, the mean score for the value of the favor was 5.55 ($SD=1.48$), which is on the higher end of the scale. Most subjects did personally value the confederate volunteering to do the speech, with only 20% of the sample selecting 4 or lower on the scale.

Desirability of completing the TSST. As a manipulation check, I asked subjects how much they wanted to complete the TSST and how happy they were when they discovered they did not have to complete the TSST. These items used a 1 (not at all) to 7 (very much) scale. The mean score for how much subjects wanted to complete the TSST was 2.61 ($SD=1.51$), which is on the lower end of the scale. Most subjects were either neutral or did not want to complete the speech, with 90% of subjects selecting 4 or lower on the scale. The mean score for how happy subjects were upon discovering they did not have to complete the TSST was 5.56 ($SD=1.36$), which is on the higher end of the scale. Most subjects were happy to not have to complete the speech task, with 93% of subjects selecting 4 or higher on the scale, and 77% of subjects selecting 5 or higher on the scale.

Individual Difference Measures

Data Cleaning

First, I reviewed the preliminary survey data to make sure subjects did not complete the survey multiple times. I found that of the 137 subjects who completed the preliminary survey, 20 (14%) subjects completed the survey twice, and two (1%) subjects completed the survey three times. The following criteria were used to determine which survey to retain: (1) If the subject completed the survey multiple times on the same day or in the same week, their first response was retained. (2) If the subject completed the survey multiple times, but there was a time gap greater than 1 week between the surveys, the response submitted closest to the day he/she completed the lab portion of the study was retained.

Trait Self-Control. The Trait Self-Control Scale (Tangney et al., 2004) was completed in the preliminary survey. The same measure was used in Pilot Study 1. The reliability for the trait self-control scale was $\alpha=0.88$, $p<.001$.

Self-Consciousness. The Adapted Public and Private Self-Consciousness Scales (Fenigstein et al., 1975) was completed in the intake survey. The same measure was used in Study 1. The reliabilities for these subscales were $\alpha=0.71$, $p<.001$ for SR private self-consciousness, $\alpha=0.75$, $p<.001$, for ISA private self-consciousness, $\alpha=0.81$, $p<.001$, for public self-consciousness, and $\alpha=0.76$, $p<.001$ for social anxiety.

Study 3 Results

Data Exclusions: Coding for Suspiciousness

Subjects' responses to the debriefing questions were used to code for suspicion and assess whether or not their degree of suspicion made their data unacceptable to use. First, I flagged whether or not each subject had one of the following different suspicions that might have warranted exclusion:

- 1. Thought it was planned that only 1 person had to do the speech.*
- 2. Thought other participant was a confederate during the entire study.*
- 3. Thought other participant was a confederate, but only after the final questionnaire.*
- 4. Thought they were being recorded during their interaction with the confederate.*
- 5. Thought the writing task made them tired and unwilling to do the speech.*
- 6. Thought the speech task was meant to stress people out.*
- 7. Thought having more than 1 person at a SONA study was suspicious.*
- 8. Thought it was suspicious the other participant volunteered so quickly.*

Fifty-five subjects (40%) thought it was planned that only 1 person had to do the speech. Ten subjects (7%) thought the other participant was a confederate during the entire study, while 25 (18%) thought the other participant was a confederate, but only after completing the final questionnaire. Two subjects (1%) thought they were being recorded during their interaction with the confederate. Four subjects (3%) thought the writing task made them feel tired and unwilling to do the speech, and 9 subjects (7%) thought the speech task was meant to stress people out. Eight subjects (6%) thought it was suspicious to have more than 1 person in a SONA study, and 11 subjects (8%) thought it was suspicious that the confederate volunteered so quickly.

When making exclusions, I used the following criteria. First, all subjects who believed the other participant was a confederate and all subjects who believed they were

being recorded during their interaction with the confederate were excluded. Additionally, there were two (1%) subjects who knew one of the experimenters and indicated during debriefing that this made them suspicious of the study. These two subjects were excluded as well. Finally, if subjects were flagged as having 3 or 4 of the 8 suspicions listed above, they were excluded for having a high degree of suspicion. In total, 22 subjects (16%) were excluded for being suspicious.

In addition to screening for suspicions, I also used the Malhalanobis distances technique to screen for multivariate outliers. One multivariate outlier was detected and removed from the dataset.

In sum, after screening for suspicions and multivariate outliers, 115 subjects were included in the final dataset. In the final sample, 57 subjects were in the depletion condition and 58 subjects were in the control condition.

Manipulation Check

Subjects completed a state self-control measure after the manipulation, so I could test whether or not subjects in the depletion condition reported lower levels of state self-control than subjects in the control condition. I found that there was not a significant difference in state self-control when comparing the depletion and control condition, $t(113)=-1.34, p=.184$. In addition, the pattern of means was not in the expected direction, with subjects in the depletion condition reporting higher levels of state self-control (mean=4.73) than subjects in the control condition (mean=4.44). This suggests that the ego-depletion manipulation was not successful. For this reason, both ego-depletion

condition and state self-control will be used in analyses concerned with fluctuations in self-control.

Despite the fact that depletion manipulation did not relate to state self-control in the anticipated direction, dispositional self-control was significantly correlated with state self-control, $r(114) = .52, p < .001$. This indicates that subjects with high dispositional self-control were also likely to report higher levels of state self-control.

Descriptive Statistics

Twenty-five (21.7%) subjects expressed gratitude to the confederate and, on average, subjects' ratings of how grateful they felt was 3.63 (SD = 1.86), which is slightly above the midpoint of the scale. When including all subjects, even those who were suspicious, these frequencies were similar. Thirty-four (24.6%) subjects expressed gratitude and on average their rating of how grateful they felt was 3.60 (SD = 1.86). Among the final sample, only one (0.9%) subject expressed indebtedness, so this variable will not be included in subsequent analyses. Additionally, on average, subjects' ratings on how indebted they felt was 1.58 (SD = 1.50), indicating that most subjects did not feel indebted as a result of the confederate volunteering to do the speech.

Hypothesis Tests

All analyses were tested using the dataset in which outliers and suspicious participants were excluded. I also conducted all analyses a second time using the full sample, for comparison. I only report results acquired from the dataset using the full sample when they differ from the results reported for the sample that excluded suspicious participants and outliers.

Correlations among Gratitude, Indebtedness, and Self-Control

First, correlations were used to examine the associations between gratitude and indebtedness. There was a significant positive correlation between feeling grateful and gratitude expression, such that the more grateful people felt the more likely they were to express gratitude, $r(113)=.24, p=.011$. However, there was not a significant correlation between feeling indebted and expressing gratitude, $r(113)=.13, p=.157$. Also, there was a positive correlation between feeling grateful and feeling indebted, $r(113)=.53, p<.001$, which is contrary to the usual negative correlation found in prior research (e.g., Mathews & Green, 2010; Tsang, 2006; Watkins, Scheer, Ovnicek, & Kolts, 2006).

Correlations were also used to examine the association between self-control, gratitude, and indebtedness. Dispositional self-control was not significantly correlated with gratitude expression, $r(114)=-.02, p=.810$, feeling grateful, $r(113)=-.08, p=.374$, or feeling indebted, $r(113)=-.08, p=.384$. Similarly, state self-control was not significantly correlated with gratitude expression, $r(114)=.01, p=.957$, feeling grateful, $r(113)=-.07, p=.482$, or feeling indebted, $r(113)=-.15, p=.120$. Thus, hypotheses 1a and 1b were not supported in study 3.

Hypothesized main effects of self-control

First, I examined whether there were differences between the depletion and control conditions on gratitude and indebtedness. Using logistic regression, I found that there were not significant group differences when looking at gratitude expression, $B=-0.33$, Odds Ratio= 0.72, Wald= 0.53, $p=.468$, 95% C.I.s {0.30, 1.75}. I also found that there were not significant group differences in feelings of gratitude, $t(112)=-0.33, p=.741$,

95% C.I.s $\{-0.81, 0.58\}$, and feelings of indebtedness $t(112) = -0.60$, $p = .549$, 95% C.I.s $\{-0.73, 0.39\}$ (see Table 31). Again, I did not find evidence supporting hypothesis 1b.

Next, I examined the main effects of self-control on gratitude expression. From this point on, all analyses control for depletion condition. I found no support for hypothesis 1a or 1b. Dispositional self-control was not a significant predictor of the odds of expressing gratitude, $B = -0.07$, Odds Ratio = 0.94, Wald = 0.06, $p = .810$, 95% C.I.s $\{0.55, 1.60\}$, nor was state self-control, $B = -0.01$, Odds Ratio = 0.99, Wald = 0.00, $p = .971$, 95% C.I.s $\{0.67, 1.46\}$. See Tables 32 and 33 for a summary of these results.

Hypothesized main effects of Self-Consciousness

Logistic regression analyses were also used to examine the effects of self-consciousness on gratitude expression while controlling for depletion condition. Self-reflective (SR) private self-consciousness, $B = -0.45$, Odds Ratio = 0.64, Wald = 3.19, $p = .074$, 95% C.I.s $\{0.39, 1.05\}$, and internal state awareness (ISA) private self-consciousness, $B = -0.48$, Odds Ratio = 0.62, Wald = 2.92, $p = .088$, 95% C.I.s $\{0.36, 1.07\}$, were marginally significant predictors of the odds of expressing gratitude. These effects indicated that participants who were high on SR or ISA private self-consciousness were less likely to express gratitude to the confederate, which lends support for hypothesis 2b, but goes counter to hypothesis 2c. However, the effects of SR and ISA private self-consciousness on gratitude expression did not reach significance when using the full sample (see Table 28). Public self-consciousness, $B = 0.01$, Odds Ratio = 1.01, Wald = 0.00, $p = .964$, 95% C.I.s $\{0.63, 1.63\}$, and social anxiety, $B = -0.35$, Odds Ratio = 0.71, Wald = 2.25, $p = .134$, 95% C.I.s $\{0.45, 1.11\}$, were not significant predictors of the odds

of expressing gratitude. This does not support hypotheses 2a and 2d. See Tables 34 and 35 for a summary of these results.

Hypothesized interactions

I examined the interactions between dispositional self-control and each of the self-consciousness factors on gratitude expression. There were no significant interactions between dispositional self-control and any of the self-consciousness factors on the odds of gratitude expression (see Tables 36 and 37). These results do not support hypotheses 3a-d. There also were no significant interactions between depletion condition and any of the self-consciousness factors on the odds of gratitude expression (see Tables 38 and 39). Additionally, there were not significant interactions between state self-control and any of the self-consciousness factors on the odds of gratitude expression (see Tables 40 and 41). These results do not support hypotheses 4a-d.

Gender effects

Just like in Studies 1 and 2, I examined whether or not there were gender differences in these effects. There was a marginally significant gender difference in gratitude expression, $t(113)=-1.92$, $p=.057$ 95% C.I.s $\{-0.40, 0.01\}$, such that more women expressed gratitude than men. Of the 96 women in the study 24 (25%) expressed gratitude, while of the 19 men in the study only one (5%) expressed gratitude. However, there were no significant gender differences in feelings of gratitude, $t(112)=-0.36$, $p=.721$ 95% C.I.s $\{-1.12, 0.78\}$ or indebtedness, $t(112)=0.51$, $p=.610$ 95% C.I.s $\{-0.57, 0.96\}$ (see Tables 42 and 43). Of greater importance to the tests of my hypotheses, there were no

significant gender by self-control interactions, nor were there significant gender by self-consciousness interactions.

Post-hoc analyses using control variables

Based on previous gratitude research (MacKenzie et al., 2014; Tsang, 2006a), I included measures of the following control variables that are typically associated with gratitude: motivational focus, cost of the favor, value of the favor, desirability of completing the TSST, and happiness as a result of not having to complete the TSST. First, I examined whether or not there were differences by condition on these control variables. There were no significant differences between the depletion and control condition on motivational focus, $t(112)=0.31$, $p=.756$, 95% C.I.s $\{-0.38, 0.52\}$, cost of the favor, $t(112)=-0.79$, $p=.429$, 95% C.I.s $\{-0.80, 0.34\}$, value of the favor, $t(112)=-0.31$, $p=.754$, 95% C.I.s $\{-0.64, 0.46\}$, desirability of completing the TSST, $t(112)=1.31$, $p=.194$, 95% C.I.s $\{-0.19, 0.93\}$, or happiness as a result of not having to complete the TSST, $t(112)=-0.69$, $p=.495$, 95% C.I.s $\{-0.68, 0.33\}$.

Next, I sought to establish that these control variables relate to gratitude in the expected directions, while controlling for depletion condition. There was a significant main effect of gratitude expression on value of the favor, $B=0.88$, $F(1,113)=7.13$, $p=.009$, 95% C.I.s $\{0.23, 1.53\}$, and happiness as a result of not having to do the speech $B=0.70$, $F(1,113)=5.37$, $p=.022$ 95% C.I.s $\{0.10, 1.31\}$. There was also a marginally significant main effect of gratitude expression on task desirability, $B=-0.65$, $F(1,113)=3.68$, $p=.057$ 95% C.I.s $\{-0.32, 0.02\}$. Similarly, there was a significant main effect of feeling grateful on perceived cost of the favor, $B=0.17$, $F(1,112)=4.65$, $p=.033$ 95% C.I.s $\{0.01, 0.32\}$, value

of the favor, $B=0.33$, $F(1,112)=21.72$, $p<.001$, 95% C.I.s $\{0.19,0.47\}$, and happiness as a result of not having to do the speech, $B=0.15$, $F(1,112)=4.96$, $p=.028$, 95% C.I.s $\{0.02,0.29\}$. These results indicate that individuals who found the favor valuable and were happy to discover they didn't have to give the speech were more likely to feel and express gratitude. Also, individuals who thought the benefactor incurred greater personal cost felt more grateful, and individuals who didn't want to give the speech were more likely to express gratitude. These results are in line with my expectations and what has been established in the previous literature (MacKenzie, Vohs, & Baumeister, 2014; Tsang, 2006a).

Next, I was interested in whether or not the self-regulation measures correlated with the control variables, since this may have implications for how self-regulation relates to both feeling and expressing gratitude. There was a significant main effect of dispositional self-control on the value of the favor, $B=-0.46$, $F(1,113)=7.92$, $p=.006$, 95% C.I.s $\{-0.78,-0.14\}$, task desirability, $B=0.50$, $F(1,113)=9.36$, $p=.003$, 95% C.I.s $\{0.18,0.82\}$, and happiness as a result of not having to do the speech, $B=-0.53$, $F(1,113)=13.16$, $p<.001$, 95% C.I.s $\{-0.82,-0.24\}$. These effects indicate that individuals high in dispositional self-control valued the favor less, found the speech task more desirable, and were less happy when discovering they did not have to give the speech. This means that the stressful speech task may not have seemed so stressful for individuals high in dispositional self-control.

When looking at the main effects of state self-control on the control variables, the results were similar to those for dispositional self-control. There was a significant main

effect of state self-control on the value of the favor, $B=-0.46$, $F(1,113)=16.31$, $p<.001$, 95% C.I.s $\{-0.68,-0.23\}$, task desirability, $B=0.30$, $F(1,113)=6.13$, $p=.015$, 95% C.I.s $\{0.06,0.53\}$, and happiness as a result of not having to do the speech, $B=-0.46$, $F(1,113)=20.16$, $p<.001$, 95% C.I.s $\{-0.67,-0.26\}$. Individuals high in state self-control valued the favor less, found the speech task more desirable, and were less happy when discovering they didn't have to do the speech. There was also a significant correlation between state self-control and motivation of the giver, $B=0.22$, $F(1,113)=5.36$, $p=.022$, 95% C.I.s $\{0.03,0.41\}$, indicating that individuals with higher state self-control believed the confederate volunteered to complete the speech for selfish reasons rather than altruistic ones. There was also a marginally significant main effect of state self-control on the perceived cost of the favor, $B=-0.24$, $F(1,113)=3.71$, $p=.057$, 95% C.I.s $\{-0.48,0.01\}$. However, the marginally significant main effect of state self-control on perceived cost of the favor did not reach significance in the full sample, $B=-0.14$, $F(1,133)=1.57$, $p=.213$, 95% C.I.s $\{-0.37,-0.08\}$. These results indicate that subjects with high state self-control thought the confederate volunteered to do the speech task for more selfish reasons, as opposed to altruistic reasons, and that confederate incurred very little personal cost as a result of volunteering to give the speech.

In sum, if subjects high on dispositional or state self-control did not find the favor valuable, think the confederate volunteered for selfish reasons, thought the confederate did not incur much personal cost as a result of volunteering to do the speech, thought giving the speech would be desirable, and did not feel happy as a result of not having to

do the speech, they would not be likely to experience gratitude as a result of my experimental manipulation.

I also investigated how self-consciousness related to the control variables. I found significant main effects of each self-consciousness factor on the value of the favor: public self-consciousness, $B=0.42$, $F(1,113)=8.70$, $p=.004$, 95% C.I.s $\{0.14,0.71\}$, self-reflective (SR) private self-consciousness, $B=0.34$, $F(1,113)=5.38$, $p=.022$, 95% C.I.s $\{0.05,0.64\}$, internal state awareness (ISA) private self-consciousness, $B=0.38$, $F(1,113)=5.03$, $p=.027$, 95% C.I.s $\{0.04,0.72\}$, and social anxiety, $B=0.55$, $F(1,113)=16.79$, $p<.001$, 95% C.I.s $\{0.28,0.81\}$. These correlations indicate that subjects high on any form of self-consciousness reported more highly valuing the favor. Also, there was a significant main effect of social anxiety on happiness as a result of not having to do the speech, $B=0.31$, $F(1,113)=5.66$, $p=.019$, 95% C.I.s $\{0.05,0.56\}$, such that subjects high in social anxiety felt happier when they realized they did not have to complete the speech. When using the full sample, two additional significant main effects emerged. First, public self-consciousness was a significant predictor of happiness as a result of not having to complete the speech, $B=0.29$, $F(1,132)=5.23$, $p=.024$, 95% C.I.s $\{0.04-0.55\}$, with individuals higher on public self-consciousness rating that they were happier upon discovering they did not have to give the speech. Next, social anxiety was a significant predictor of desirability of the TSST, $B=-0.28$, $F(1,132)=4.63$, $p=.033$, 95% C.I.s $\{-0.54- -0.02\}$, showing that individuals higher on social anxiety thought the TSST was less desirable. These results indicate that subjects who are highly self-conscious were more likely to experience gratitude as a result of the experimental manipulation, since

they found the favor extremely valuable and were happier upon discovering they don't have to give a speech.

Cultural Differences

When comparing White and Asian participants, there was not a significant difference in the odds of expressing gratitude in the lab, $B = -0.25$, Odds Ratio = 0.78, Wald = 0.22, $p = .636$, 95% C.I.s {0.27, 2.20}, with 13 (25%) White participants and 7 (21%) Asian participants expressing gratitude in the lab. Also, there was not a significant interaction between culture and depletion condition on the odds of expressing gratitude in the lab, $B = -0.29$, Odds Ratio = 0.75, Wald = 0.27, $p = .607$, 95% C.I.s {0.25, 2.25}.

Brief Discussion of Study 3

The goal of study 3 was to establish a causal effect of self-control on behavioral gratitude expression. I found little support of my hypotheses in this study. To start, I did not find support for hypothesis 1a, that higher dispositional self-control is associated with gratitude expression. I also did not find support for hypothesis 1b, that when people are depleted they are less likely to express gratitude. One crucial reason behind these null findings is that my experimental manipulation of self-regulatory depletion did not work as expected. Participants in the depletion and control condition did not report different levels of state self-control, indicating that self-regulatory capacity was not successfully manipulated in the study. Additionally, the rate of gratitude was lower than expected, suggesting that the gratitude induction utilized in the study may not have produced as widespread feelings of gratitude as anticipated.

Though the depletion manipulation did not accurately represent the construct, self-reported dispositional and state self-control served as alternative predictors of gratitude expression. These self-report variables also were not associated with gratitude expression in the hypothesized direction. One potential explanation for these null findings is that participants high on both dispositional and state self-control wanted to do the task that had been intended to be undesirable and felt less appreciative when the confederate volunteered to do the task. Participants with high self-control did not experience relief and gratitude when discovering they did not have to give the speech, and gratitude cannot be experienced if one doesn't perceive that someone else has done them a favor or benefited them in some way.

While establishing a causal effect of self-control on gratitude expression was the central goal of study 3, I also examined the associations between self-consciousness and behavioral gratitude expression. I found limited support for this set of hypotheses. I did not find support for hypothesis 2a, that people higher in public self-consciousness would be less likely to express gratitude. However, I did find support for hypothesis 2b, that people higher on SR private self-consciousness were less likely to express gratitude. I did not find support for hypothesis 2c, that people higher on ISA private self-consciousness were more likely to express gratitude. In fact, contrary to my predictions, individuals high in ISA private self-consciousness were less likely to express gratitude. One reason for this finding may be that in study 3, the ISA private self-consciousness factor was positively correlated with SR private self-consciousness; therefore the associations of SR and ISA private self-consciousness with gratitude expression were similar. This means

that the ISA private self-consciousness variable was not an accurate representation of the construct as established in the previous literature. ISA private self-consciousness is usually negatively correlated with SR private self-consciousness, and is meant to represent an adaptive form of self-awareness that is theoretically similar to the mindfulness construct (E. M. Anderson et al., 1996). Therefore, the counterintuitive associations between ISA private self-consciousness and gratitude expression in study 3 should be interpreted with caution. Lastly, I did not find support for hypothesis 2d, that people high on social anxiety would be less likely to express gratitude.

Next, I did not find support for hypotheses 3 and 4, in which I predicted there would be interactions between dispositional self-control and self-consciousness on gratitude expression and that there would be interactions between self-regulatory depletion and self-consciousness on gratitude expression.

I also found that more women expressed gratitude than men, which is consistent with both the previous literature (Kashdan et al., 2009) and studies 1 and 2. However, I did not find significant gender by self-regulation interactions on gratitude expression, nor did I find significant gender by self-consciousness interactions on gratitude expression.

A major limitation of study 3 is construct validity. Based on the previous self-regulation and gratitude literature, it was reasonable to expect that the ego-depletion task would successfully manipulate self-regulatory depletion, and that the gratitude induction would successfully elicit feelings of appreciation. Though the TSST is frequently used in psychology research to induce stress, high self-control appears to be an unanticipated boundary condition of this effect. At least in the current study, participants with high self-

control wanted to give a speech about math, and were unhappy upon discovering that they wouldn't have to give the speech. Though people may react differently if they actually have to give a speech about math, simply anticipating having to give a speech was not undesirable to individuals high in self-control. This emphasizes the difficulty of identifying tasks or activities that are universally undesirable, as well as the difficulty in generalizing what will induce gratitude in an experimentally controlled environment.

Chapter 5: General Discussion

The goal of this research was to better understand the mechanisms behind gratitude expression by identifying factors that reduce people's willingness to express gratitude. To my knowledge this is the only program of research that has examined gratitude expression while also measuring feelings of gratitude and indebtedness. Study 1 examined the association between self-control, self-consciousness, and gratitude expression among individuals in romantic relationships. Another goal of Study 1 was to establish that gratitude is an independent construct despite overlap with other positive relationship factors, such as relationship satisfaction and communal strength. Study 2 examined how daily fluctuations in self-control influence daily gratitude expression, as well as investigating the interaction of self-control with several dispositional variables. Study 3 examined the causal effect of self-regulatory depletion on behavioral expressions of gratitude in a laboratory setting.

Summary of the results for each hypothesis

In Studies 1 and 2, I found that self-control was positively associated with gratitude expression, supporting hypothesis set 1. In Study 1 with individuals in romantic

relationships, dispositional self-control was positively associated with expressing gratitude to one's romantic partner, and this effect remained significant after adding control variables. In Study 2 with an undergraduate sample, daily self-control was associated with greater gratitude expression to close others, but this effect was no longer significant after adding control variables. Finally, in Study 3, an experiment in which participants could express gratitude to a stranger, there was no association between self-regulatory depletion and gratitude expression.

Hypothesis 2a, that higher public self-consciousness is associated with less gratitude expression, was not supported. There was support for hypothesis 2b, that high SR private self-consciousness is associated with less gratitude expression, in Study 3. However, there was not a significant effect of SR private self-consciousness on gratitude expression in Studies 1 and 2.

There was mixed support for hypothesis 2c, that ISA private self-consciousness is associated with more gratitude expression. In Study 1 my hypothesis was supported, as being high on ISA private self-consciousness was associated with expressing more gratitude to one's romantic partner. However, in Study 2 there was not a significant effect of ISA private self-consciousness on gratitude expression, and in Study 3 being high on ISA private self-consciousness was associated with less gratitude expression, the opposite of what I hypothesized.

Additionally, in Studies 1 and 2, I found support for hypothesis 2d, that social anxiety is associated with less gratitude expression. In Study 1, social anxiety was associated with expressing less gratitude to one's romantic partner, but this effect did not

remain significant after adding additional controls. In Study 2, both dispositional and daily social anxiety was associated with expressing less gratitude to close others and these effects remained significant even after adding additional controls. Social anxiety was not associated with gratitude expression in Study 3.

The interaction effects that emerged did not support hypothesis sets 3 and 4. For a full summary of these results, see Table 44. Study 1 found a significant positive association between self-control and expressing gratitude to a romantic partner for individuals low in social anxiety. However, there was no association between self-control and gratitude expression for individuals high on social anxiety. Study 2 found that for both individuals low and high on ISA private self-consciousness, there was a positive association between daily self-control and gratitude expression, but that this association was stronger for individuals higher on ISA private self-consciousness. I anticipated that self-control would have a stronger effect on gratitude expression for individuals who were higher in maladaptive forms of self-consciousness, which would be high social anxiety and low ISA private self-consciousness in this case. Yet, I found the opposite to be true. It appears that self-control had the strongest influence for individuals with more adaptive forms of self-consciousness or lower levels of self-consciousness.

Interpretation of effects that supported my hypotheses

As predicted, having high self-control does promote more gratitude expression. It could be the case that self-control is most important when it comes to expressing gratitude to a romantic partner and close others, but may not matter as much in other contexts where intimacy is low, since self-control was not associated with gratitude

expression to a stranger in Study 3. If gratitude expression is in fact a form of relationship maintenance, as I proposed, it would make sense that self-control would matter most in the context of close relationships. With romantic partners and close others, expressing gratitude may become more effortful because the gratitude we experience might be less norm-based and more based on specific qualities about the relationship partner or specific favors a relationship partner bestows. It may also be the case that relationship partners do favors for each other often, so that these favors become part of the background of everyday interaction within the relationship, often not rising to the level of exceptionalness that suggest offering thanks. In other words, partners in long-term relationships may become habituated to the favors that they do for each other. In order to express gratitude to a romantic partner, therefore, partners may need sufficient self-control and effort to explicitly notice the benefit that was provided.

However, gratitude expression does not occur exclusively in close relationships, since we regularly express gratitude to strangers or in other low intimacy relationships. In relationships that are low in intimacy, gratitude expression may not serve as a relationship maintenance mechanism in the same way. In these contexts, gratitude expression might be driven by social norms or expectations, which serves as a more generalized form of politeness that may not necessarily require self-control to enact.

This research also indicates that social anxiety is the most robust predictor of being less willing to express gratitude. This result corresponds with previous research which found that social anxiety is a robust predictor of feeling less gratitude (Mathews & Green, 2010). If someone feels uneasy in a social situation, they probably will not want to

make themselves even more vulnerable to others. For this reason, they may feel less comfortable with gratitude expression since it is a form of self-disclosure and may suggest increasing intimacy and vulnerability with others. By expressing gratitude, one acknowledges an imbalance of benefits provided, since people experience gratitude when someone else does something helpful for us that we could not have done alone. Making this known by expressing gratitude may create even more discomfort, especially for individuals who already feel uncomfortable interacting with others.

Discussion of what might explain hypotheses that were not supported

There was no support for hypothesis 2a, that public self-consciousness is associated with less willingness to express gratitude. Why might public self-consciousness not have a significant effect on gratitude expression? It's possible that individuals who are either high and low public self-consciousness may behave in the same way, but as a result of different motives. For instance, people with low public self-consciousness who are less worried about how others perceive them will not be worried about appearing vulnerable or conveying intimacy to others, which would then result in greater willingness to express gratitude. Alternatively, people with high public self-consciousness who are concerned with how others perceive them may have a heightened awareness of social norms and may be aware that gratitude expression is a positive thing that is expected in certain situations. This sort of motivation would also result in greater willingness to express gratitude.

Across these three studies I found inconsistent effects of ISA private self-consciousness on gratitude expression. Though there was support for hypothesis 2c, that

ISA private self-consciousness is associated with more gratitude expression, in Study 1, this effect was not replicated in Studies 2 and 3. Additionally, only in Study 2 did I find a significant interaction effect, but the simple slopes were not in the direction predicted in hypothesis 4c. More specifically, there was a stronger positive effect of daily self-control on gratitude expression among individuals high in ISA private self-consciousness than individuals low in ISA private self-consciousness, which opposite of what was expected. One reason for these discrepant results is that ISA private self-consciousness may simply be a neutral non-evaluative form of self-focus that does not negatively affect well-being, but does not necessarily positively affect well-being either (Anderson et al., 1996). In other words, ISA private self-consciousness might not be maladaptive like other forms of self-consciousness (Anderson et al., 1996), but it doesn't necessarily have a robust positive influence on various different indicators of well-being. Therefore, when examining the effect ISA private self-consciousness has on gratitude expression, ISA private self-consciousness may not have a consistent positive effect because it may not be an inherently adaptive form of self-focus.

Another reason for these discrepant effects of ISA private self-consciousness on gratitude expression might be the role that context plays in how ISA private self-consciousness may manifest. ISA private self-consciousness is characterized by an awareness of one's current internal state. Individuals reporting how much gratitude they typically express to their romantic partner are likely to be in a very different mindset than individuals in a laboratory deciding whether or not to express gratitude to a stranger who offered to take over doing a stressful speech. Since the attributions that precede gratitude

often rely on the context, and individuals high on ISA private self-consciousness have an acute awareness of their internal state in a given context, this combination may result in inconsistent associations between ISA private self-consciousness and gratitude expression.

In the three studies, none of the predicted interactions between dispositional self-control and self-consciousness, and between self-regulatory depletion and self-consciousness, on gratitude expression were supported. Either the interactions were null or the simple slopes of the significant interactions were not in the predicted direction. I anticipated that individuals with qualities that are associated with low gratitude expression would report greater gratitude expression if they were high in dispositional self-control and would report less gratitude expression if they were under self-regulatory depletion, since they may require a greater amount of self-regulatory resources to express gratitude. However, I found the opposite to be true. Individuals who were more likely to express gratitude, such as individuals with low social anxiety and women, were more likely to express gratitude when they were high in dispositional self-control. Additionally, on days when state self-control was high, individuals with high ISA private self-consciousness were more likely to express gratitude compared to those with low ISA private self-consciousness.

Why might it be the case that self-control doesn't benefit those who are the least likely to express gratitude? One reason might be that these individuals aren't motivated to express gratitude in the first place. Self-control would only be advantageous in helping people overcome difficulties with expressing gratitude if they feel motivated to do so.

Another important reason why people are not always motivated to express gratitude is that the specific elicitors of gratitude are often idiosyncratic. In the current research, individual differences, particularly dispositional self-control, influenced what participants perceived as a favor, and therefore what elicited feeling and expressing gratitude. This means the gratitude induction paradigm, in which I created a real-time situation where a confederate did a favor for a participant, may have been a weak manipulation that was influenced by individual differences more than anticipated. While feeling grateful and expressing gratitude most likely have generalizable underpinnings, what specifically people feel grateful for may be more idiosyncratic, since this process is based on appraisals and attributions. For instance, in Study 3, in response to the confederate volunteering to give a stressful speech, participants with either high dispositional self-control or high state self-control did not perceive this as a valuable favor-- they thought the confederate volunteered for selfish reasons, thought the confederate did not incur much personal cost, thought the speech task was desirable, and felt unhappy that they did not get to give the speech. Combined, these responses suggest that individuals with high self-control may have wanted to give this speech and did not perceive the confederate doing them a favor. In other words, these individuals may not have felt grateful as a result of the gratitude induction and, therefore, did not express gratitude, an interpretation which highlights the importance of the attributional component of gratitude.

Though dispositional self-control was associated with gratitude expression in Study 1 and daily fluctuations in self-control were associated with gratitude expression in study 2, there were no significant effects of either dispositional self-control or self-

regulatory depletion on gratitude expression in Study 3. In Study 3, the goal was to establish a causal link between self-control and gratitude expression, but this ended up being the only study where there was no association between the two variables. A key reason for these null effects in Study 3 is that the ego-depletion task was not successful. Participants in the depletion and control conditions indicated they had similar amounts of self-control after completing the task. Though the selected ego-depletion task (Writing without As and Ns; Schmeichel, 2007) is used frequently in the literature, there are a few possible reasons why the manipulation did not work in this research. First, though writing without As and Ns is intended to be taxing on working memory processes, people may utilize other skills to complete this task, like creativity and problem solving, adding noise that may interfere with the manipulation. In contrast, other ego-depletion measures, like the Stroop task (Stroop, 1935), may be more direct manipulations because the cognitive process (i.e., inhibition) required to successfully complete the task is clearer. Another reason the ego-depletion task in Study 3 did not work may be that a writing task may not be perceived as draining and tedious as other ego-depletion tasks. In fact, during the debriefing portion of Study 3, some participants said they enjoyed the writing task and thought it was fun and calming to write about the most recent trip they took. If writing is not perceived as tedious, and if participants approach the difficult depletion condition with creative strategies, they may not experience ego-depletion.

Finally, based on the previous literature, I anticipated that gratitude and indebtedness would be negatively correlated, since they are theoretical opposites. However, this finding was not replicated in the three studies conducted. In Study 1,

feelings of gratitude and indebtedness were uncorrelated, while in studies 2 and 3 gratitude and indebtedness were positively correlated. This pattern does not correspond with the previous literature, which has generally found gratitude and indebtedness to be negatively correlated. Additionally, participants tended to report feeling a great deal of gratitude, but feeling a lot of indebtedness was rare.

Why might I have found a positive association between gratitude and indebtedness? Perhaps because the same situations can elicit gratitude and indebtedness, people may experience both emotions simultaneously. Another reason for this correlation could be the phrasing and structure of the gratitude and indebtedness measure. Asking people to directly report if they feel appreciative or indebted may yield different results than asking them to respond to scale items that get at the concept using a more fully defined format. That is, asking participants “On a scale of 0-6, how grateful do you feel?” may yield different responses than “I feel appreciative when I notice my partner did something nice for me.” Using the format of the latter statement to differentiate between gratitude and indebtedness might result in better differentiation than the former format (which was used in this research).

Gender differences

In all three studies women were more willing to express gratitude than men. This gender difference was most pronounced in Study 3, where 24 (25%) female participants expressed gratitude, but only one (5%) male participant expressed gratitude. This gender difference dovetails with previous research findings that indicated that women feel and express gratitude more often than men (Kashdan et al., 2009). Women tend to be more

comfortable with emotional expression, and often help others, and actively strive to maintain strong social bonds (Kashdan et al., 2009). This tendency toward prosocial behavior among women corresponds well with the concept of communal orientation, the inclination to feel responsible for the needs of others and to provide help non-contingently when others need it. Both feeling grateful and expressing gratitude are associated with increases in the degree to which people feel communally oriented in a particular relationship (Algoe et al., 2010; Lambert et al., 2010). In this light, women, who tend to be more communally oriented, may also be more likely to express gratitude. In contrast, men tend to be more focused on acquiring power and status. Social power in both social hierarchies and interpersonal relationships is associated with experiencing less gratitude and a lower desire to reciprocate prosocial behavior, since powerful individuals often make cynical attributions when others provide favors to them (Inesi et al., 2012). As traditionally high status individuals, men may be suspicious of benefactors' motivations, which would result in men feeling grateful less frequently and expressing less gratitude as a result.

There were also a few significant gender interactions. In Study 1, for men, there was a significant effect of SR private self-consciousness on feelings of gratitude, showing that men higher in SR private self-consciousness reported feeling less gratitude toward their romantic partner. In contrast, for women there was not a significant effect of SR private self-consciousness on feeling grateful. In Study 2, dispositional self-control was not associated with men's gratitude expression, but women with high dispositional self-control reported greater daily gratitude expression. It appears that self-control does not

seem to help people who are unlikely to express gratitude overcome this tendency, again potentially because they are not as motivated to overcome this tendency in the first place. However, these interactions should be interpreted with caution since they were not predicted and given the large number of interactions examined, might be due to chance. Replication of these effects is needed in future research.

Limitations and future research suggestions

One limitation of this research is that it focused on sampling one relationship type per study, rather than collecting data across multiple different relationship types in a single study. This approach did not permit direct comparison of how self-control and self-consciousness may differentially effect gratitude expression depending on the relationship context. For instance, as I discussed earlier, the motivation and processes underlying gratitude expression in romantic relationships may differ from those of expressing gratitude to a stranger. Future research should explicitly examine gratitude expression in different social contexts to clarify the underlying mechanisms of gratitude expression and to document how social norms may influence the different motivational processes preceding gratitude expression.

Another limitation is that this research did not use representative samples. Two of the three studies used undergraduate samples, which limits the generalizability of this work. Perhaps gratitude functions differently among people with different levels of SES, who probably experience different struggles and receive different favors from others than undergraduate populations, which may influence how the processes underlying gratitude manifest. Additionally, the participants in Studies 1 and 3 were predominantly female. If

women are already predisposed to feeling and expressing gratitude, this may limit the variability in gratitude and gratitude expression that is observed. This means we may understand how gratitude works among individuals who experience relatively high levels of it, but have less information about individuals who experience less gratitude or who are less prone to express gratitude to others. Future research should focus on acquiring a generalizable sample in order to better understand the underpinnings of gratitude expression.

Further limitations arose particularly in Study 3, as there were issues with measurement validity. Specifically, the ego-depletion manipulation did not successfully deplete participants. Additionally, not all subjects interpreted the confederate volunteering to give a stressful speech as a favor, and therefore some did not experience gratitude, much less express it, as a result of the gratitude induction. Future research should utilize more effective measures of ego-depletion, such as the Stroop task. Future research should also utilize a method of gratitude induction that relies on an individual's own personal experience or memories of feeling grateful, or one that is more successful in leading everyone to feel gratitude.

Yet another limitation is that Studies 1 and 3 utilized many self-report measures that were completed at only one time point. Self-report measures can be prone to biased responding, especially as a result of social desirability and demand characteristics. This is particularly important with a concept like gratitude, which most people think of as normatively positive. In fact, since gratitude is often linked with morality (McCullough et al., 2001), when people perceive someone as ungrateful they typically make numerous

negative attributions (Emmons & Crumpler, 2000). Future gratitude research should focus on developing and utilizing other measurements of gratitude expression that do not depend on self-report scales.

Conclusion

This research was designed to better understand the circumstances under which people are more or less likely to express gratitude. This is the first research to systematically measure self-control and self-consciousness as predictors of gratitude expression while also controlling for both feelings of gratitude and indebtedness. This research revealed that self-control and social anxiety are important correlates with gratitude expression. Though the previous literature frequently documents the link between feeling grateful and well-being, this research adds to the literature an empirical examination of why some individuals struggle with reaping the benefits associated with gratitude expression. The limitations of this work have also proved to be informative. Self-control may not help people overcome individual differences that are associated with feeling and expressing low amounts of gratitude, perhaps because the motivation required to activate the benefits of self-control is lacking. My hope is that this work will inform future research on gratitude expression by highlighting the importance of motivation, personal attributions, and relationship context in determining whether or not one feels or expresses gratitude to others and whether or not one reaps the psychological and health benefits of gratitude.

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Table 1

Pilot Study 1: Correlation Table (part 1)

	2	3	4	5	6	7	8	9	10
1. Gratitude Expression	.375***	.045	.259**	.264**	-.106	.014	-.156†	-.156†	.323***
2. Relationship Satisfaction	1	.127	.753***	.119	.091	.061	-.432***	-.395***	.499***
3. Relationship Power		1	.219**	.061	-.089	.088	-.009	.086	.105
4. Trust			1	.214**	-.098	.158†	-.348***	-.307***	.499***
5. Self-Esteem				1	-.499***	.268**	.015	.053	.130
6. Shyness					1	-.593***	-.073	-.129	-.108
7. Sociability						1	.068	.114	.114
8. Quality of Alternative (Facet)							1	.520***	-.309***
9. Quality of Alternatives (Global)								1	-.361***

***p<.001, **p<.01, *p<.05, † p<.10

Table 1 Continued

	11	12	13	14	15	16	17
1. Gratitude Expression	.256**	-.066	-.066	.161†	.058	.040	.090
2. Relationship Satisfaction	.710***	-.167*	-.286**	.103	.044	-.145†	.389***
3. Relationship Power	.115	-.127	-.093	.110	.104	-.061	.059
4. Trust	.600***	-.350***	-.378***	.282**	.084	-.054	.243**
5. Self-Esteem	.092	-.340***	-.284**	.459***	-.038	.214*	.053
6. Shyness	.100	.409***	.238**	-.332***	.022	-.137	-.035
7. Sociability	.001	-.206*	-.159†	.133	.093	.028	.036
8. Quality of Alternative (Facet)	-.470***	.163†	.100	-.119	.044	-.082	-.374***
9. Quality of Alternatives (Global)	-.490***	.151†	.145†	-.163†	-.171*	.055	-.272**
10. Communal Strength	.639***	-.192*	-.288***	.190*	-.012	.051	.324***
11. Commitment	1	-.171*	-.291***	.243**	.086	-.004	.479***
12. Anxious Attachment		1	.546***	-.306***	.043	-.107	-.088
13. Avoidant Attachment			1	-.255**	.004	.051	-.150†
14. Self-Control				1	.028	.225**	.059
15. Gender					1	-.046	-.026
16. Age						1	.016
17. IOS							--

***p<.001, **p<.01, *p<.05, † p<.10

Table 2

Pilot Study 2: To whom people express gratitude

Who	Count	Percentage
Family (parents, siblings, children)	18	26%
Friend	15	21%
Romantic partner	12	17%
Co-worker	7	10%
Other (customer, housemates, stranger, teacher, therapist, person who gave a ride)	7	10%
Unclear	4	6%
Church patron	3	4%
Neighbor	2	3%
Service person	2	3%
Total	70	100%

Table 3

Pilot Study 2: For what people express gratitude

What	Count	Percentage
Food	17	24%
Support	14	20%
Money	10	14%
Other (clothes, concert, editing novel, fixing haircut, given a bike, helping the elderly, person, sick, touching words)	9	13%
Home (help buying a home, help moving, mowing lawn, given land, carrying hay bales)	5	7%
Work task	5	7%
Driving	4	6%
Giving opportunity	3	4%
Car repair	2	3%
Food and money	1	1%
Total	70	100%

Table 4

Pilot Study 2: Qualitative Themes

Why don't you express gratitude?			Why don't others express gratitude?		
Reason	Frequency	Percentage	Reason	Frequency	Percentage
Awkward	12	17%	Insecure	32	36%
Unnecessary	10	14%	Awkward	15	17%
N/A (I always express gratitude)	10	14%	Undeserving	10	11%
Undeserving	9	13%	Pride	9	10%
Self-control	8	11%	Unnecessary	7	8%
Insecure	7	10%	Indebtedness	5	6%
Missed opportunity	5	7%	Personality	4	4%
Pride	4	6%	Other	3	3%
Indebtedness	4	6%	Missed opportunity	2	2%
Undesired outcomes	3	4%	Undesired outcomes	2	2%
Total	72	100%	Total	89	100%

Table 5

Study 1: Correlations between gratitude expression and relationship variables

	2	3	4	5	6	7	8	9	10	11	12	13
1. Gratitude Expression	.24***	.12*	-.12*	-.02	.27***	.18**	.02	.24***	-.04	-.12*	.15**	.27***
2. Dyadic Trust	1	.20***	-.22***	-.24***	.42***	.39***	-.24***	-.07	-.07	-.11 [†]	.09	.67***
3. Self-Esteem		1	-.10 [†]	-.05	.09	.05	-.30***	.05	-.30***	-.46***	.40***	.22***
4. Quality of Alternative (Facet)			1	.65***	-.36***	-.54***	.14*	.02	.03	-.04	-.16**	-.33***
5. Quality of Alternative (Global)				1	-.38***	-.49***	.13*	.03	.02	-.05	-.10 [†]	-.37***
6. Communal Strength					1	.66***	-.09 [†]	.07	-.01	.04	.14*	.53***
7. Commitment						1	-.13*	.06	.04	.12*	.15**	.59***
8. SR							1	.44***	.40***	.23***	-.32***	-.24***
9. ISA								1	.25***	.04	.01	.00
10. PSC									1	.42***	-.33***	-.09
11. SA										1	-.28***	-.11 [†]
12. Self-Control											1	.16**
13. Relationship Satisfaction												1

***p<.001, **p<.01, *p<.05, [†] p<.10

Table 6
Study 1: Gratitude Expression Regression Analyses

Step	Variable	B	SE	β	F	p	R ²	95% CI
Self-Control x SR Private Self-Consciousness								
1					4.27*	.015	0.03	
	Constant	4.14***	0.18		553.67	<.001		3.79, 4.48
	SC	0.11**	0.04	0.17	8.42	.004		0.04, 0.19
	SR	0.04	0.03	0.07	1.59	.209		-0.02, 0.09
2					2.86*	.037	0.03	
	Constant	4.06***	0.38		113.95	<.001		3.31, 4.81
	SC	0.14	0.11	0.20	1.65	.199		-0.07, 0.34
	SR	0.06	0.12	0.12	0.26	.610		-0.18, 0.30
	SC x SR	-0.01	0.04	-0.05	0.05	.828		-0.08, 0.06
Self-Control x ISA Private Self-Consciousness								
1					13.73***	<.001	0.08	
	Constant	3.63***	0.19		359.12	<.001		3.25, 4.01
	SC	0.10**	0.04	0.14	7.17	.008		0.03, 0.17
	ISA	0.17***	0.04	0.24	20.10	<.001		0.09, 0.24
2					9.17***	<.001	0.08	
	Constant	3.85***	0.65		34.84	<.001		2.57, 5.13
	SC	0.03	0.19	0.05	0.03	.863		-0.34, 0.41
	ISA	0.11	0.16	0.16	0.50	.481		-0.20, 0.43
	SC x ISA	0.02	0.05	0.13	0.12	.727		-0.08, 0.11
Self-Control x Public Self-Consciousness								
1					3.47*	.032	0.02	
	Constant	4.28***	0.20		462.75	<.001		3.89, 4.67
	SC	0.10*	0.04	0.15	6.29	.013		0.02, 0.18
	PSC	0.002	0.03	0.004	0.00	.944		-0.06, 0.06
2					2.72*	.045	0.02	
	Constant	3.72***	0.54		47.13	<.001		2.65, 4.79
	SC	0.26†	0.15	0.39	2.98	.085		-0.04, 0.56
	PSC	0.15	0.14	0.28	1.20	.275		-0.12, 0.42
	SC x PSC	-0.04	0.04	-0.31	1.23	.269		-0.12, 0.03
Self-Control x Social Anxiety								
1					4.53*	.011	0.03	
	Constant	4.45***	0.17		707.56	<.001		4.12, 4.78
	SC	0.08*	0.04	0.12	4.51	.034		0.01, 0.16
	SA	-0.04	0.03	-0.08	2.09	.150		-0.09, 0.01
2					4.02**	.008	0.04	
	Constant	3.95***	0.34		138.59	<.001		3.29, 4.61
	SC	0.23*	0.10	0.34	5.90	.016		0.04, 0.42
	SA	0.14	0.10	0.30	1.70	.194		-0.07, 0.34
	SC x SA	-0.05†	0.03	-0.40	2.94	.087		-0.12, 0.01

***p<.001, **p<.01, *p<.05, † p<.10

Table 7

Study 1: Correlations between Gratitude Emotion, Indebtedness, and Gratitude Expression

	2	3
1. Gratitude Emotion	.01	.31***
2. Indebtedness	1	-.05
3. Gratitude Expression		1

***p<.001, **p<.01, *p<.05, † p<.10

Table 8

Study 1: Correlations between gratitude emotion and relationship variables

	2	3	4	5	6	7	8	9	10	11	12	13
1. Gratitude Emotion	.53**	.16**	-.15**	-.13*	.38***	.42***	-.08	.08	-.05	-.08	.10 [†]	.66***
2. Dyadic Trust	1	.20***	-.22***	-.24***	.42***	.39***	-.24***	-.07	-.07	-.11 [†]	.09	.67***
3. Self-Esteem		1	-.10 [†]	-.05	.09	.05	-.30***	.05	-.30***	-.46***	.40***	.22***
4. Quality of Alternative (Facet)			1	.65***	-.36***	-.54***	.14*	.02	.03	-.04	-.16**	-.33***
5. Quality of Alternative (Global)				1	-.38***	-.49***	.13*	.03	.02	-.05	-.10 [†]	-.37***
6. Communal Strength					1	.66***	-.09 [†]	.07	-.01	.04	.14*	.53***
7. Commitment						1	-.13*	.06	.04	.12*	.15**	.59***
8. SR							1	.44***	.40***	.23***	-.32***	-.24***
9. ISA								1	.25***	.04	.01	.00
10. PSC									1	.42***	-.33***	-.09
11. SA										1	-.28***	-.11 [†]
12. Self-Control											1	.16**
13. Relationship Satisfaction												1

***p<.001, **p<.01, *p<.05, [†] p<.10

Table 9

Study 1: Correlations between indebtedness and relationship variables

	2	3	4	5	6	7	8	9	10	11	12	13
1. Indebtedness	-.15**	.00	.03	.09 [†]	.00	-.02	.16**	.04	.09 [†]	.05	-.02	-.13*
2. Dyadic Trust	1	.20***	-.22***	-.24***	.42***	.39***	-.24***	-.07	-.07	-.11 [†]	.09	.67***
3. Self-Esteem		1	-.10 [†]	-.05	.09	.05	-.30***	.05	-.30***	-.46***	.40***	.22***
4. Quality of Alternative (Facet)			1	.65***	-.36***	-.54***	.14*	.02	.03	-.04	-.16**	-.33***
5. Quality of Alternative (Global)				1	-.38***	-.49***	.13*	.03	.02	-.05	-.10 [†]	-.37***
6. Communal Strength					1	.66***	-.09 [†]	.07	-.01	.04	.14*	.53***
7. Commitment						1	-.13*	.06	.04	.12*	.15**	.59***
8. SR							1	.44***	.40***	.23***	-.32***	-.24***
9. ISA								1	.25***	.04	.01	.00
10. PSC									1	.42***	-.33***	-.09
11. SA										1	-.28***	-.11 [†]
12. Self-Control											1	.16**
13. Relationship Satisfaction												1

***p<.001, **p<.01, *p<.05, † p<.10

Table 10

Study 1: Gratitude expression regression analyses controlling for gratitude emotion

Step	Variable	B	SE	β	F	p	R ²	95% CI
Self-Control x SR Private Self-Consciousness								
1					13.93***	<.001	0.12	
	Constant	3.39***	0.21		252.03	<.001		2.97, 3.81
	Grat emo	0.16***	0.03	0.30	32.40	<.001		0.10, 0.21
	SC	0.10*	0.04	0.14	6.54	.011		0.02, 0.17
	SR	0.04	0.03	0.09	2.57	.110		-0.01, 0.10
2					10.42***	<.001	0.12	
	Constant	3.37***	0.38		77.11	<.001		2.61, 4.12
	Grat emo	0.16***	0.03	0.30	32.25	<.001		0.10, 0.21
	SC	0.10	0.10	0.15	1.03	.311		-0.10, 0.30
	SR	0.05	0.12	0.10	0.19	.659		-0.18, 0.28
	SC x SR	0.00	0.03	-0.01	0.00	.951		-0.07, 0.06
Self-Control x ISA Private Self-Consciousness								
1					19.58***	<.001	0.16	
	Constant	3.03***	0.21		198.97	<.001		2.61, 3.46
	Grat emo	0.14***	0.03	0.28	28.90	<.001		0.09, 0.20
	SC	0.08*	0.04	0.11	4.93	.027		0.01, 0.15
	ISA	0.15***	0.04	0.22	17.69	<.001		0.08, 0.22
2					14.76***	<.001	0.16	
	Constant	3.41***	0.63		29.17	<.001		2.17, 4.65
	Grat emo	0.14***	0.03	0.28	29.11	<.001		0.09, 0.20
	SC	-0.03***	0.18	-0.05	0.04	.849		-0.39, 0.32
	ISA	0.06	0.15	0.08	0.14	.712		-0.25, 0.36
	SC x ISA	0.03	0.04	0.22	0.40	.529		-0.06, 0.12
Self-Control x Public Self-Consciousness								
1					12.98***	<.001	0.11	
	Constant	3.56***	0.23		240.05	<.001		3.11, 4.01
	Grat emo	0.15***	0.03	0.30	31.35	<.001		0.10, 0.21
	SC	0.08*	0.04	0.12	4.39	.037		0.00, 0.16
	PSC	0.01	0.03	0.01	0.03	.866		-0.05, 0.06
2					9.87***	<.001	0.11	
	Constant	3.19***	0.53		36.63	<.001		2.15, 4.23
	Grat emo	0.15***	0.03	0.29	30.57	<.001		0.10, 0.21
	SC	0.19	0.15	0.28	1.67	.197		-0.10, 0.48
	PSC	0.11	0.13	0.19	0.62	.430		-0.16, 0.37
	SC x PSC	-0.03	0.04	-0.20	0.60	.441		-0.11, 0.05

Table 10 continued

Self-Control x Social Anxiety								
Step	Variable	B	SE	β	<i>F</i>	<i>p</i>	<i>R</i> ²	95% CI
1					13.53***	<.001	0.11	
	Constant	3.72***	0.21		322.51	<.001		3.31, 4.13
	Grat emo	0.15***	0.03	0.29	30.69	<.001		0.10, 0.21
	SC	0.07†	0.04	0.10	3.02	.083		-0.01, 0.14
	SA	-0.03	0.02	-0.07	1.50	.222		-0.08, 0.02
2					10.59***	<.001	0.12	
	Constant	3.37***	0.34		98.98	<.001		2.70, 4.04
	Grat emo	0.15***	0.03	0.29	29.24	<.001		0.09, 0.20
	SC	0.18†	0.09	0.26	3.57	.060		-0.01, 0.36
	SA	0.10	0.10	0.21	0.91	.341		-0.10, 0.29
	SC x SA	-0.04	0.03	-0.29	1.68	.195		-0.10, 0.02

****p*<.001, ***p*<.01, **p*<.05, † *p*<.10

Table 11

Study 1: Gratitude expression regression analyses controlling for indebtedness emotion

Step	Variable	B	SE	β	F	p	R ²	95% CI
Self-Control x SR Private Self-Consciousness								
1					3.23*	.023	0.03	
	Constant	4.16***	0.18		550.23	<.001		3.82, 4.51
	Indebt	-0.02	0.02	-0.06	1.29	.256		-0.06, 0.01
	SC	0.12**	0.04	0.17	8.51	.004		0.04, 0.19
	SR	0.04	0.03	0.08	1.98	.160		-0.02, 0.10
2					2.43*	.048	0.03	
	Constant	4.09***	0.38		114.72	<.001		3.34, 4.84
	Indebt	-0.02	0.02	-0.06	1.29	.256		-0.06, 0.01
	SC	0.14	0.11	0.20	1.66	.198		-0.07, 0.34
	SR	0.07	0.12	0.13	0.30	.586		-0.17, 0.31
	SC x SR	-0.01	0.04	-0.05	0.05	.831		-0.08, 0.06
Self-Control x ISA Private Self-Consciousness								
1					9.49***	<.001	0.08	
	Constant	3.67***	0.19		354.79	<.001		3.29, 4.06
	Indebt	-0.02	0.02	-0.06	1.29	.258		-0.05, 0.01
	SC	0.10*	0.04	0.14	6.99	.009		0.02, 0.17
	ISA	0.17***	0.04	0.24	20.33	<.001		0.10, 0.24
2					7.13***	<.001	0.08	
	Constant	3.88***	0.65		35.26	<.001		2.60, 5.17
	Indebt	-0.02	0.02	-0.06	1.27	.261		-0.05, 0.01
	SC	0.03	0.19	0.05	0.03	.858		-0.34, 0.41
	ISA	0.12	0.16	0.17	0.53	.469		-0.20, 0.43
	SC x ISA	0.02	0.05	0.12	0.11	.737		-0.08, 0.11
Self-Control x Public Self-Consciousness								
1					2.56†	.055	0.02	
	Constant	4.31***	0.20		458.71	<.001		3.91, 4.70
	Indebt	-0.02	0.02	-0.05	0.87	.351		-0.05, 0.02
	SC	0.10*	0.04	0.15	6.24	.013		0.02, 0.18
	PSC	0.00	0.03	0.01	0.02	.882		-0.06, 0.07
2					2.19†	.070	0.03	
	Constant	3.78***	0.55		47.85	<.001		2.71, 4.86
	Indebt	-0.02	0.02	-0.05	0.74	.390		-0.05, 0.02
	SC	0.25	0.15	0.37	2.71	.101		-0.05, 0.55
	PSC	0.14	0.14	0.27	1.07	.301		-0.13, 0.42
	SC x PSC	-0.04	0.04	-0.29	1.06	.304		-0.12, 0.04

Table 11 continued

Self-Control x Social Anxiety								
Step	Variable	B	SE	β	<i>F</i>	<i>p</i>	<i>R</i> ²	95% CI
1					3.27*	.021	0.03	
	Constant	4.49***	0.17		681.56	<.001		4.15, 4.83
	Indebt	-0.01	0.02	-0.05	0.73	.395		-0.05, 0.02
	SC	0.08*	0.04	0.12	4.32	.039		0.00, 0.16
	SA	-0.04	0.03	-0.08	2.10	.148		-0.09, 0.01
2					3.17*	.014	0.04	
	Constant	4.00***	0.34		138.30	<.001		3.33, 4.66
	Indebt	-0.01	0.02	-0.05	0.73	.395		-0.05, 0.02
	SC	0.23*	0.10	0.34	5.63	.018		0.04, 0.42
	SA	0.13	0.10	0.29	1.59	.208		-0.07, 0.34
	SC x SA	-0.05†	0.03	-0.39	2.80	.095		-0.11, 0.01

****p*<.001, ***p*<.01, **p*<.05, † *p*<.10

Table 12

Study 1: Mean and Standard Deviations of Gratitude Expression, Gratitude Emotion, and Indebtedness by Gender

	Male	Female	<i>df</i>	<i>t</i>	<i>p</i>
Gratitude Expression	4.50 (0.60)	4.65 (0.50)	319	-2.26*	.025
Gratitude Emotion	5.03 (1.10)	5.07 (1.00)	319	-0.30	.762
Indebtedness	2.75 (1.73)	2.00 (1.61)	318	3.51**	.001

Means are reported above and standard deviations (in parentheses).

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table 13

*Study 1: Gender by Self-Reflective Private Self-Consciousness on Gratitude Emotion
Regression Analysis*

Step	Variable	B	SE(B)	β	<i>F</i>	<i>p</i>	<i>R</i> ²	95% CI
1					0.89	.411	0.01	
	Constant	5.23***	0.19		731.29	<.001		4.85 - 5.61
	Gender	0.03	0.13	0.01	0.06	.813		-0.23 - 0.29
	SR	-0.07	0.05	-0.07	1.69	.194		-0.18 - 0.04
2					2.18†	.090	0.02	
	Constant	5.84***	0.34		294.67	<.001		5.17 - 6.51
	Gender	-0.76†	0.38	-0.32	3.86	.050		-1.51 - 0.00
	SR	-0.28*	0.11	-0.29	6.44	.012		-0.50 - -0.06
	Gender X SR	0.27*	0.13	0.41	4.74	.030		0.03 - 0.52

****p*<.001, ***p*<.01, **p*<.05, † *p*<.10

Table 14

*Study 2: Main effects on gratitude expression**

	B	SE	<i>t</i>	<i>p</i>	95% CI		
Person Level							
Intercept	4.07***	0.72	<i>t</i> (218)= 5.65	<.001	2.65,	5.49	
SC	0.17	0.14	<i>t</i> (218)= 1.19	.236	-0.11,	0.45	
SR	0.13	0.11	<i>t</i> (218)= 1.17	.244	-0.09,	0.35	
ISA	0.08	0.13	<i>t</i> (218)= 0.60	.546	-0.18,	0.34	
PSC	-0.10	0.13	<i>t</i> (218)= -0.73	.464	-0.36,	0.16	
SA	-0.22*	0.10	<i>t</i> (218)= -2.25	.025	-0.42,	-0.02	
Daily Level							
DAY	0.00	0.01	<i>t</i> (2755)= -0.14	.891	-0.02,	0.02	
SSCCS	0.12***	0.03	<i>t</i> (2755)= 3.81	<.001	0.06,	0.18	
STRESS	0.01	0.02	<i>t</i> (2755)= 0.38	.706	-0.03,	0.05	
SOCANX	-0.28***	0.05	<i>t</i> (2755)= -6.07	<.001	-0.38,	-0.18	

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 15

*Study 2: Main effects on gratitude expression controlling for feelings of gratitude and indebtedness**

	B	SE	<i>t</i>	<i>p</i>	95% CI		
Person Level							
Intercept	4.10***	0.72	<i>t</i> (218)=	5.68	<.001	2.68,	5.52
SC	0.16	0.14	<i>t</i> (218)=	1.18	.241	-0.12,	0.44
SR	0.13	0.11	<i>t</i> (218)=	1.16	.249	-0.09,	0.35
ISA	0.08	0.13	<i>t</i> (218)=	0.61	.546	-0.18,	0.34
PSC	-0.09	0.13	<i>t</i> (218)=	-0.73	.468	-0.35,	0.17
SA	-0.22*	0.10	<i>t</i> (218)=	-2.28	.024	-0.42,	-0.02
Daily Level							
DAY	0.00	0.01	<i>t</i> (2749)=	-0.50	.614	-0.02,	0.02
GRAT	0.35***	0.03	<i>t</i> (2749)=	13.70	<.001	0.29,	0.41
INDEBT	0.01	0.03	<i>t</i> (2749)=	0.59	.555	-0.05,	0.07
SSCCS	0.03	0.03	<i>t</i> (2749)=	1.20	.231	-0.03,	0.09
STRESS	0.02	0.02	<i>t</i> (2749)=	1.19	.235	-0.02,	0.06
SOCANX	-0.22***	0.04	<i>t</i> (2749)=	-5.44	<.001	-0.30,	-0.14

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 16

*Study 2: Main effects on gratitude expression controlling for feelings of gratitude and indebtedness and prior day gratitude expression**

	B	SE	<i>t</i>	<i>p</i>	95% CI		
Person Level							
Intercept	3.78***	0.70	<i>t</i> (218)=	5.43	<.001	2.40,	5.16
SC	0.18	0.13	<i>t</i> (218)=	1.32	.190	-0.08,	0.44
SR	0.12	0.10	<i>t</i> (218)=	1.15	.253	-0.08,	0.32
ISA	0.06	0.13	<i>t</i> (218)=	0.49	.621	-0.20,	0.32
PSC	-0.09	0.12	<i>t</i> (218)=	-0.71	.481	-0.33,	0.15
SA	-0.20*	0.09	<i>t</i> (218)=	-2.20	.029	-0.38,	-0.02
Daily Level							
DAY	0.00	0.01	<i>t</i> (2502)=	-0.07	.945	-0.02,	0.02
PRIOR DAY GRAT EXP	0.06*	0.02	<i>t</i> (2502)=	2.50	.013	0.02,	0.10
GRAT	0.34***	0.03	<i>t</i> (2502)=	12.46	<.001	0.28,	0.40
INDEBT	0.00	0.03	<i>t</i> (2502)=	0.11	.913	-0.06,	0.06
SSCCS	0.05	0.03	<i>t</i> (2502)=	1.58	.114	-0.01,	0.11
STRESS	0.02	0.02	<i>t</i> (2502)=	1.21	.225	-0.02,	0.06
SOCANX	-0.23***	0.04	<i>t</i> (2502)=	-6.09	<.001	-0.31,	-0.15

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 17

*Study 2: Dispositional self-control by self-consciousness interactions on gratitude expression**

	B	SE	<i>t</i>	<i>p</i>	95% CI		
Person Level							
Intercept	4.60†	2.77	<i>t</i> (214)=	1.66	.098	-0.86,	10.06
SC	0.00	0.86	<i>t</i> (214)=	0.00	1.000	-1.70,	1.70
SR	-0.23	0.48	<i>t</i> (214)=	-0.48	.629	-1.18,	0.72
ISA	-0.18	0.64	<i>t</i> (214)=	-0.28	.777	-1.44,	1.08
PSC	0.12	0.65	<i>t</i> (214)=	0.18	.859	-1.16,	1.40
SA	0.01	0.55	<i>t</i> (214)=	0.02	.981	-1.07,	1.09
SC X PSC	-0.07	0.20	<i>t</i> (214)=	-0.33	.743	-0.46,	0.32
SC X SR	0.12	0.15	<i>t</i> (214)=	0.76	.447	-0.18,	0.42
SC X ISA	0.08	0.20	<i>t</i> (214)=	0.39	.698	-0.31,	0.47
SC X SA	-0.07	0.17	<i>t</i> (214)=	-0.44	.660	-0.41,	0.27
Daily Level							
DAY	0.00	0.01	<i>t</i> (2751)=	-0.14	.890	-0.02,	0.02
SSCCS	0.12***	0.03	<i>t</i> (2751)=	3.81	<.001	0.06,	0.18
STRESS	0.01	0.02	<i>t</i> (2751)=	0.38	.706	-0.03,	0.05
SOCANX	-0.28***	0.05	<i>t</i> (2751)=	-6.07	<.001	-0.38,	-0.18

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 18

*Study 2: Dispositional self-control by self-consciousness interactions on gratitude expression controlling for feelings of gratitude and indebtedness**

	B	SE	<i>t</i>	<i>p</i>	95% CI	
Person Level						
Intercept	4.63†	2.77	<i>t</i> (214)=	1.67	.096	-0.83, 10.09
SC	0.00	0.86	<i>t</i> (214)=	0.00	.997	-1.70, 1.70
SR	-0.23	0.48	<i>t</i> (214)=	-0.48	.628	-1.18, 0.72
ISA	-0.18	0.64	<i>t</i> (214)=	-0.29	.775	-1.44, 1.08
PSC	0.11	0.65	<i>t</i> (214)=	0.18	.859	-1.17, 1.39
SA	0.01	0.55	<i>t</i> (214)=	0.02	.983	-1.07, 1.09
SC X PSC	-0.07	0.20	<i>t</i> (214)=	-0.33	.745	-0.46, 0.32
SC X SR	0.12	0.15	<i>t</i> (214)=	0.76	.448	-0.18, 0.42
SC X ISA	0.08	0.20	<i>t</i> (214)=	0.39	.696	-0.31, 0.47
SC X SA	-0.07	0.17	<i>t</i> (214)=	-0.44	.659	-0.41, 0.27
Daily Level						
DAY	0.00	0.01	<i>t</i> (2745)=	-0.51	.613	-0.02, 0.02
GRAT	0.35***	0.03	<i>t</i> (2745)=	13.70	<.001	0.29, 0.41
INDEBT	0.01	0.03	<i>t</i> (2745)=	0.59	.555	-0.05, 0.07
SSCCS	0.03	0.03	<i>t</i> (2745)=	1.20	.231	-0.03, 0.09
STRESS	0.02	0.02	<i>t</i> (2745)=	1.19	.235	-0.02, 0.06
SOCANX	-0.22***	0.04	<i>t</i> (2745)=	-5.44	<.001	-0.30, -0.14

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 19

*Study 2: Dispositional self-control by self-consciousness interactions on gratitude expression controlling for feelings of gratitude and indebtedness and prior day gratitude expression**

	B	SE	<i>t</i>	<i>p</i>	95% CI	
Person Level						
Intercept	4.31	2.74	<i>t</i> (214)=	1.57	0.117	-1.09, 9.71
SC	0.02	0.84	<i>t</i> (214)=	0.02	0.984	-1.64, 1.68
SR	-0.25	0.45	<i>t</i> (214)=	-0.56	0.578	-1.14, 0.64
ISA	-0.11	0.62	<i>t</i> (214)=	-0.18	0.860	-1.33, 1.11
PSC	-0.04	0.62	<i>t</i> (214)=	-0.06	0.951	-1.26, 1.18
SA	0.11	0.54	<i>t</i> (214)=	0.21	0.835	-0.95, 1.17
SC X PSC	-0.02	0.19	<i>t</i> (214)=	-0.09	0.927	-0.39, 0.35
SC X SR	0.12	0.15	<i>t</i> (214)=	0.83	0.408	-0.18, 0.42
SC X ISA	0.05	0.19	<i>t</i> (214)=	0.26	0.793	-0.32, 0.42
SC X SA	-0.10	0.16	<i>t</i> (214)=	-0.62	0.538	-0.42, 0.22
Daily Level						
DAY	0.00	0.01	<i>t</i> (2498)=	-0.07	0.944	-0.02, 0.02
PRIOR DAY GRAT EXP	0.06*	0.02	<i>t</i> (2498)=	2.50	0.013	0.02, 0.10
GRAT	0.34***	0.03	<i>t</i> (2498)=	12.46	<.001	0.28, 0.40
INDEBT	0.00	0.03	<i>t</i> (2498)=	0.11	0.913	-0.06, 0.06
SSCCS	0.05	0.03	<i>t</i> (2498)=	1.58	0.114	-0.01, 0.11
STRESS	0.02	0.02	<i>t</i> (2498)=	1.21	0.225	-0.02, 0.06
SOCANX	-0.23***	0.04	<i>t</i> (2498)=	-6.09	<.001	-0.31, -0.15

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 20

*Study 2: State self-control by self-consciousness interactions on gratitude expression**

	B	SE	<i>t</i>		<i>p</i>	95% CI	
Person Level							
Intercept	4.07***	0.72	<i>t</i> (218)=	5.64	<.001	2.65,	5.49
SC	0.17	0.14	<i>t</i> (218)=	1.19	.236	-0.11,	0.45
SR	0.13	0.11	<i>t</i> (218)=	1.17	.244	-0.09,	0.35
ISA	0.08	0.13	<i>t</i> (218)=	0.60	.546	-0.18,	0.34
PSC	-0.10	0.13	<i>t</i> (218)=	-0.73	.464	-0.36,	0.16
SA	-0.22*	0.10	<i>t</i> (218)=	-2.25	.025	-0.42,	-0.02
Daily Level							
DAY	0.00	0.01	<i>t</i> (2751)=	-0.04	.965	-0.02,	0.02
SSCCS	-0.21	0.18	<i>t</i> (2751)=	-1.18	.237	-0.56,	0.14
SSCCS by SR	-0.02	0.04	<i>t</i> (2751)=	-0.65	.514	-0.10,	0.06
SSCCS by ISA	0.11*	0.05	<i>t</i> (2751)=	2.00	.045	0.01,	0.21
SSCCS by PSC	-0.01	0.04	<i>t</i> (2751)=	-0.20	.839	-0.09,	0.07
SSCCS by SA	0.03	0.03	<i>t</i> (2751)=	0.88	.381	-0.03,	0.09
STRESS	0.01	0.02	<i>t</i> (2751)=	0.39	.698	-0.03,	0.05
SOCANX	-0.28***	0.05	<i>t</i> (2751)=	-6.06	<.001	-0.38,	-0.18

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 21

*Study 2: State self-control by self-consciousness interactions on gratitude expression controlling for feelings of gratitude and indebtedness**

	B	SE	<i>t</i>	<i>p</i>	95% CI		
Person Level							
Intercept	4.09***	0.72	<i>t</i> (218)=	5.67	<.001	2.67,	5.51
SC	0.16	0.14	<i>t</i> (218)=	1.18	.241	-0.12,	0.44
SR	0.13	0.11	<i>t</i> (218)=	1.16	.249	-0.09,	0.35
ISA	0.08	0.13	<i>t</i> (218)=	0.61	.545	-0.18,	0.34
PSC	-0.09	0.13	<i>t</i> (218)=	-0.73	.468	-0.35,	0.17
SA	-0.22*	0.10	<i>t</i> (218)=	-2.28	.024	-0.42,	-0.02
Daily Level							
DAY	0.00	0.01	<i>t</i> (2745)=	-0.40	.688	-0.02,	0.02
GRAT	0.35***	0.03	<i>t</i> (2745)=	13.68	<.001	0.29,	0.41
INDEBT	0.01	0.03	<i>t</i> (2745)=	0.58	.561	-0.05,	0.07
SSCCS	-0.29†	0.16	<i>t</i> (2745)=	-1.80	.072	-0.60,	0.02
SSCCS by SR	-0.01	0.04	<i>t</i> (2745)=	-0.26	.793	-0.09,	0.07
SSCCS by ISA	0.09†	0.05	<i>t</i> (2745)=	1.87	.061	-0.01,	0.19
SSCCS by PSC	0.01	0.04	<i>t</i> (2745)=	0.26	.793	-0.07,	0.09
SSCCS by SA	0.01	0.03	<i>t</i> (2745)=	0.27	.785	-0.05,	0.07
STRESS	0.02	0.02	<i>t</i> (2745)=	1.16	.247	-0.02,	0.06
SOCANX	-0.22***	0.04	<i>t</i> (2745)=	-5.46	<.001	-0.30,	-0.14

*Confidence interval computed using <http://www.danielsooper.com/statcalc/calculator.aspx?id=26>

Table 22

*Study 2: State self-control by self-consciousness interactions on gratitude expression controlling for feelings of gratitude and indebtedness and prior day gratitude expression**

	B	SE	<i>t</i>	<i>p</i>	95% CI		
Person Level							
Intercept	3.78***	0.70	<i>t</i> (218)=	5.43	<.001	2.40,	5.16
SC	0.18	0.13	<i>t</i> (218)=	1.32	.190	-0.08,	0.44
SR	0.12	0.10	<i>t</i> (218)=	1.15	.253	-0.08,	0.32
ISA	0.06	0.13	<i>t</i> (218)=	0.49	.622	-0.20,	0.32
PSC	-0.09	0.12	<i>t</i> (218)=	-0.71	.481	-0.33,	0.15
SA	-0.20*	0.09	<i>t</i> (218)=	-2.20	.029	-0.38,	-0.02
Daily Level							
DAY	0.00	0.01	<i>t</i> (2498)=	-0.02	.981	-0.02,	0.02
PRIOR DAY GRAT EXP	0.06*	0.02	<i>t</i> (2498)=	2.52	.012	0.02,	0.10
GRAT	0.34***	0.03	<i>t</i> (2498)=	12.55	<.001	0.28,	0.40
INDEBT	0.00	0.03	<i>t</i> (2498)=	0.09	.926	-0.06,	0.06
SSCCS	-0.26	0.19	<i>t</i> (2498)=	-1.34	.181	-0.63,	0.11
SSCCS by SR	-0.02	0.04	<i>t</i> (2498)=	-0.47	.641	-0.10,	0.06
SSCCS by ISA	0.09†	0.05	<i>t</i> (2498)=	1.66	.097	-0.01,	0.19
SSCCS by PSC	0.03	0.04	<i>t</i> (2498)=	0.57	.571	-0.05,	0.11
SSCCS by SA	0.00	0.03	<i>t</i> (2498)=	-0.04	.972	-0.06,	0.06
STRESS	0.02	0.02	<i>t</i> (2498)=	1.18	.239	-0.02,	0.06
SOCANX	-0.23***	0.04	<i>t</i> (2498)=	-6.09	<.001	-0.31,	-0.15

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 23

*Study 2: Daily social anxiety by self-control interactions on gratitude expression**

	B	SE	<i>t</i>		<i>p</i>	95% CI	
Person Level							
Intercept	4.23	0.75	<i>t</i> (218)=	5.65	<.001	2.75,	5.71
SC	0.17	0.14	<i>t</i> (218)=	1.22	.225	-0.11,	0.45
SR	0.13	0.11	<i>t</i> (218)=	1.22	.223	-0.09,	0.35
ISA	0.06	0.13	<i>t</i> (218)=	0.47	.639	-0.20,	0.32
PSC	-0.10	0.13	<i>t</i> (218)=	-0.77	.444	-0.36,	0.16
SA	-0.20	0.10	<i>t</i> (218)=	-2.06	.040	-0.40,	0.00
Daily Level							
DAY	0.00	0.01	<i>t</i> (2749)=	-0.04	.967	-0.02,	0.02
SSCCS	-0.20	0.19	<i>t</i> (2749)=	-1.09	.278	-0.57,	0.17
SSCCS by SR	-0.02	0.04	<i>t</i> (2749)=	-0.64	.522	-0.10,	0.06
SSCCS by ISA	0.11	0.05	<i>t</i> (2749)=	1.94	.052	0.01,	0.21
SSCCS by PSC	0.00	0.04	<i>t</i> (2749)=	-0.02	.982	-0.08,	0.08
SSCCS by SA	0.04	0.03	<i>t</i> (2749)=	1.10	.273	-0.02,	0.10
STRESS	0.01	0.02	<i>t</i> (2749)=	0.31	.760	-0.03,	0.05
SOCANX	-0.07	0.22	<i>t</i> (2749)=	-0.33	.744	-0.50,	0.36
SC by SOCANX	-0.05	0.07	<i>t</i> (2749)=	-0.69	.492	-0.19,	0.09
SSCCS by SOCANX	-0.01	0.02	<i>t</i> (2749)=	-0.78	.435	-0.05,	0.03

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 24

*Study 2: Main effects on feelings of gratitude**

	B	SE	<i>t</i>	<i>p</i>	95% CI	
Person Level						
Intercept	2.36**	0.76	<i>t</i> (218)= 3.09	.003	0.86,	3.86
SC	0.29†	0.15	<i>t</i> (218)= 1.96	.051	-0.01,	0.59
SR	0.26*	0.12	<i>t</i> (218)= 2.25	.025	0.02,	0.50
ISA	0.09	0.13	<i>t</i> (218)= 0.63	.527	-0.17,	0.35
PSC	-0.21	0.13	<i>t</i> (218)= -1.61	.108	-0.47,	0.05
SA	-0.09	0.10	<i>t</i> (218)= -0.95	.345	-0.29,	0.11
Daily Level						
DAY	0.01	0.01	<i>t</i> (2759)=0.90	.368	-0.01,	0.03
SSCCS	0.24***	0.04	<i>t</i> (2759)=6.68	<.001	0.16,	0.32
STRESS	-0.04†	0.02	<i>t</i> (2759)=-1.78	.074	-0.08,	0.00
SOCANX	-0.17***	0.04	<i>t</i> (2759)=-4.08	<.001	-0.25,	-0.09

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 25

*Study 2: Dispositional self-control by self-consciousness interactions on feelings of gratitude**

	B	SE	<i>t</i>	<i>p</i>	95% CI	
Person Level						
Intercept	2.75	2.74	<i>t</i> (214)= 1.01	.316	-2.65,	8.15
SC	0.15	0.88	<i>t</i> (214)= 0.18	.862	-1.58,	1.88
SR	-0.08	0.50	<i>t</i> (214)= -0.15	.880	-1.07,	0.91
ISA	-0.21	0.68	<i>t</i> (214)= -0.31	.754	-1.55,	1.13
PSC	0.30	0.65	<i>t</i> (214)= 0.47	.640	-0.98,	1.58
SA	-0.14	0.53	<i>t</i> (214)= -0.27	.791	-1.18,	0.90
SC X PSC	-0.16	0.20	<i>t</i> (214)= -0.77	.440	-0.55,	0.23
SC X SR	0.11	0.16	<i>t</i> (214)= 0.67	.503	-0.21,	0.43
SC X ISA	0.09	0.21	<i>t</i> (214)= 0.42	.674	-0.32,	0.50
SC X SA	0.01	0.17	<i>t</i> (214)= 0.07	.943	-0.33,	0.35
Daily Level						
DAY	0.01	0.01	<i>t</i> (2755)= 0.90	.369	-0.01	0.03
SSCCS	0.24***	0.04	<i>t</i> (2755)= 6.68	<.001	0.16	0.32
STRESS	-0.04†	0.02	<i>t</i> (2755)= -1.78	.074	-0.08	0.00
SOCANX	-0.17***	0.04	<i>t</i> (2755)= -4.08	<.001	-0.25	-0.09

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 26

*Study 2: State self-control by self-consciousness interactions on feelings of gratitude**

	B	SE	<i>t</i>	<i>p</i>	95% CI	
Person Level						
Intercept	2.36**	0.76	<i>t</i> (218)= 3.09	.003	0.86,	3.86
SC	0.29†	0.15	<i>t</i> (218)= 1.96	.051	-0.01,	0.59
SR	0.26*	0.12	<i>t</i> (218)= 2.25	.025	0.02,	0.50
ISA	0.09	0.13	<i>t</i> (218)= 0.63	.527	-0.17,	0.35
PSC	-0.21	0.13	<i>t</i> (218)= -1.61	.108	-0.47,	0.05
SA	-0.09	0.10	<i>t</i> (218)= -0.95	.345	-0.29,	0.11
Daily Level						
DAY	0.01	0.01	<i>t</i> (2755)= 0.92	.360	-0.01,	0.03
SSCCS	0.20	0.31	<i>t</i> (2755)= 0.67	.503	-0.41,	0.81
SSCCS by SR	-0.04	0.04	<i>t</i> (2755)= -1.02	.309	-0.12,	0.04
SSCCS by ISA	0.05	0.05	<i>t</i> (2755)= 0.85	.397	-0.05,	0.15
SSCCS by PSC	-0.04	0.08	<i>t</i> (2755)= -0.55	.580	-0.20,	0.12
SSCCS by SA	0.05	0.04	<i>t</i> (2755)= 1.29	.197	-0.03,	0.13
STRESS	-0.04†	0.02	<i>t</i> (2755)= -1.72	.085	-0.08,	0.00
SOCANX	-0.17***	0.04	<i>t</i> (2755)= -4.04	<.001	-0.25,	-0.09

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 27

*Study 2: Main effect of culture (White vs. Asian) on gratitude expression, feelings of gratitude, and feelings of indebtedness**

Gratitude Expression						
	B	SE	<i>t</i>	<i>p</i>	95% CI	
Intercept	4.37***	0.10	<i>t</i> (179)= 45.54	<.001	4.17,	4.57
RACE	0.22*	0.09	<i>t</i> (179)= 2.52	.013	0.04,	0.40
Feelings of Gratitude						
	B	SE	<i>t</i>	<i>p</i>	95% CI	
Intercept	3.32***	0.10	<i>t</i> (179)= 34.91	<.001	3.12,	3.52
RACE	0.34**	0.09	<i>t</i> (179)= 3.67	.001	0.16,	0.52
Feelings of Indebtedness						
	B	SE	<i>t</i>	<i>p</i>	95% CI	
Intercept	1.66***	0.09	<i>t</i> (179)= 17.67	<.001	1.48,	1.84
RACE	-0.25*	0.10	<i>t</i> (179)= -2.56	.012	-0.45,	-0.05

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 28

*Study 2: Culture (White vs. Asian) by state self-control interaction on gratitude expression**

	B	SE	<i>t</i>	<i>p</i>	95% CI	
Person Level						
Intercept	4.39***	0.09	<i>t</i> (179)= 46.55	<.001	4.21,	4.57
RACE	0.22*	0.09	<i>t</i> (179)= 2.59	.011	0.04,	0.40
Daily Level						
DAY	0.00	0.01	<i>t</i> (2224)= 0.09	.930	-0.02,	0.02
SSCCS	0.11**	0.03	<i>t</i> (2224)= 3.26	.002	0.05,	0.17
SSCCS by RACE	0.09**	0.03	<i>t</i> (2224)= 2.78	.006	0.03,	0.15
STRESS	0.00	0.02	<i>t</i> (2224)= 0.19	.852	-0.04,	0.04
STRESS by RACE	0.00	0.02	<i>t</i> (2224)=0.17	.867	-0.04,	0.04
SOCANX	-0.28***	0.05	<i>t</i> (2224)= -6.00	<.001	-0.38,	-0.18
SOCANX by RACE	0.07	0.05	<i>t</i> (2224)=1.50	.135	-0.03,	0.17

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 29

*Study 2: Culture (White vs. Asian) by dispositional self-control interaction on gratitude expression**

	B	SE	<i>t</i>	<i>p</i>	95% CI	
Person Level						
Intercept	4.54***	0.49	<i>t</i> (175)= 9.35	<.001	3.57,	5.51
SC	0.15	0.13	<i>t</i> (175)= 1.19	.238	-0.11,	0.41
SA	-0.28**	0.10	<i>t</i> (175)=-2.83	.006	-0.48,	-0.08
RACE	-0.43	0.48	<i>t</i> (175)= -0.88	.380	-1.38,	0.52
RACE X SC	0.14	0.13	<i>t</i> (175)= 1.12	.264	-0.12,	0.40
RACE X SA	0.05	0.10	<i>t</i> (175)=0.54	.589	-0.15,	0.25
Daily Level						
DAY	0.00	0.01	<i>t</i> (2223)= -0.01	.991	-0.02,	0.02
SSCCS	0.11**	0.03	<i>t</i> (2223)= 3.30	.001	0.05,	0.17
STRESS	0.00	0.02	<i>t</i> (2223)= 0.21	.837	-0.04,	0.04
SOCANX	-0.27***	0.05	<i>t</i> (2223)= -5.27	<.001	-0.37,	-0.17

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 30

*Study 2: Culture (White vs. Asian) by feelings of gratitude interaction on gratitude expression**

	B	SE	<i>t</i>	<i>p</i>	95% CI	
Person Level						
Intercept	3.02***	0.12	<i>t</i> (179)= 24.87	<.001	2.78,	3.26
RACE	-0.20	0.11	<i>t</i> (179)= -1.79	.075	-0.42,	0.02
Daily Level						
DAY	0.00	0.01	<i>t</i> (2223)= -0.25	.802	-0.02,	0.02
GRAT_EMO	0.40***	0.03	<i>t</i> (2223)= 15.77	<.001	0.34,	0.46
GRAT_EMO by RACE	0.08**	0.02	<i>t</i> (2223)= 3.43	.001	0.04,	0.12
STRESS	0.02	0.02	<i>t</i> (2223)= 0.98	.326	-0.02,	0.06
SOCANX	-0.20***	0.04	<i>t</i> (2223)= -4.87	<.001	-0.28,	- 0.12

*Confidence interval computed using <http://www.danielsoper.com/statcalc/calculator.aspx?id=26>

Table 31

Study 3: Differences in gratitude expression, gratitude feelings, and indebtedness feelings across depletion conditions

	Control Condition			Depletion Condition			<i>t</i>	<i>p</i>
	M	n	SD	M	n	SD		
Gratitude expression (0= did not express, 1= expressed)	0.19	58	0.40	0.25	57	0.43	-0.72	.471
Feelings of Gratitude	3.57	58	2.00	3.68	56	1.71	-0.33	.741
Feelings of Indebtedness	1.50	58	1.47	1.67	56	1.55	-0.60	.549

Table 32

Study 3: Main effects of depletion condition, dispositional self-control, and state self-control on gratitude expression in logistic regression (excluding suspicious participants and outliers)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-1.12***	0.31	13.30	<.001	0.33	
Depletion Condition	-0.33	0.46	0.53	.468	0.72	0.30, 1.75
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.93	0.84	1.23	.267	0.39	
Dispositional Self-Control	-0.07	0.27	0.06	.810	0.94	0.55, 1.60
Depletion Condition	-0.33	0.46	0.53	.469	0.72	0.30, 1.75
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-1.09	0.98	1.22	.269	0.34	
State Self-Control	-0.01	0.20	0.00	.971	0.99	0.67, 1.46
Depletion Condition	-0.33	0.46	0.53	.469	0.72	0.29, 1.76

Table 33

Study 3: Main effects of depletion condition, dispositional self-control, and state self-control on gratitude expression in logistic regression (all subjects)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.97***	0.27	12.89	<.001	0.38	
Depletion Condition	-0.31	0.40	0.62	.430	0.73	0.34, 1.59
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.95	0.76	1.55	.213	0.39	
Dispositional Self-Control	-0.02	0.24	0.01	.921	0.98	0.61, 1.57
Depletion Condition	-0.26	0.40	0.42	.516	0.77	0.35, 1.69
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-1.22	0.87	1.95	.162	0.30	
State Self-Control	0.06	0.17	0.11	.745	1.06	0.76, 1.48
Depletion Condition	-0.32	0.40	0.64	.424	0.73	0.33, 1.59

Table 34

Study 3: Main effects of self-consciousness factors on gratitude expression controlling for depletion condition in logistic regression (excluding suspicious participants and outliers)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	0.25	0.80	0.09	.759	1.28	
SR	-0.45†	0.25	3.19	.074	0.64	0.39, 1.05
Depletion Condition	-0.14	0.47	0.09	.761	0.87	0.34, 2.19
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	0.71	1.10	0.42	.518	2.03	
ISA	-0.48†	0.28	2.92	.088	0.62	0.36, 1.07
Depletion Condition	-0.32	0.46	0.49	.483	0.72	0.29, 1.79
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-1.16	0.94	1.54	.214	0.31	
PSC	0.01	0.24	0.00	.964	1.01	0.63, 1.63
Depletion Condition	-0.33	0.46	0.52	.469	0.72	0.29, 1.77
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.01	0.79	0.00	.991	0.99	
SA	-0.35	0.23	2.25	.134	0.71	0.45, 1.11
Depletion Condition	-0.27	0.46	0.33	.564	0.77	0.31, 1.89

Table 35

Study 3: Main effects of self-consciousness factors on gratitude expression controlling for depletion condition in logistic regression (all subjects)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.13	0.69	0.04	.845	0.87	
SR	-0.29	0.21	1.88	.170	0.75	0.50, 1.13
Depletion Condition	-0.15	0.41	0.14	.709	0.86	0.38, 1.92
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	0.15	0.98	0.02	.877	1.16	
ISA	-0.30	0.24	1.51	.219	0.74	0.46, 1.19
Depletion Condition	-0.27	0.40	0.45	.500	0.76	0.35, 1.68
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-1.32	0.82	2.61	.106	0.27	
PSC	0.08	0.21	0.15	.697	1.09	0.72, 1.64
Depletion Condition	-0.28	0.41	0.48	.488	0.75	0.34, 1.67
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.38	0.69	0.31	.581	0.68	
SA	-0.20	0.20	1.00	.318	0.82	0.56, 1.21
Depletion Condition	-0.23	0.40	0.32	.574	0.80	0.36, 1.76

Table 36

Study 3: Dispositional self-control by self-consciousness interactions on gratitude expression controlling for depletion condition in logistic regression (excluding suspicious participants and outliers)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	0.55	2.80	0.04	.843	1.74	
Dispositional Self-Control	-0.02	0.89	0.00	.985	0.98	0.17, 5.58
SR	-0.30	0.85	0.12	.726	0.74	0.14, 3.92
Depletion Condition	-0.10	0.48	0.04	.835	0.91	0.35, 2.32
Dispositional Self-Control _X_SR	-0.09	0.29	0.09	.761	0.92	0.52, 1.61
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	1.12	3.96	0.08	.777	3.07	
Dispositional Self-Control	-0.13	1.27	0.01	.921	0.88	0.07, 10.6
ISA	-0.50	1.02	0.24	.625	0.61	0.08, 4.49
Depletion Condition	-0.32	0.46	0.48	.490	0.73	0.29, 1.80
Dispositional Self-Control _X_ISA	0.00	0.33	0.00	.991	1.00	0.53, 1.92
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-2.44	3.40	0.52	.473	0.09	
Dispositional Self-Control	0.45	1.04	0.19	.665	1.57	0.20, 12.06
PSC	0.41	0.85	0.23	.631	1.50	0.29, 7.92
Depletion Condition	-0.35	0.46	0.56	.454	0.71	0.29, 1.75
Dispositional Self-Control _X_PSC	-0.14	0.27	0.27	.601	0.87	0.51, 1.48
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	5.03	3.29	2.34	.126	152.93	
Dispositional Self-Control	-1.65	1.06	2.42	.120	0.19	0.02, 1.54
SA	-1.71†	0.96	3.19	.074	0.18	0.03, 1.18
Depletion Condition	-0.24	0.47	0.26	.608	0.79	0.31, 1.97
Dispositional Self-Control _X_SA	0.45	0.31	2.06	.151	1.57	0.85, 2.90

Table 37

Study 3: Dispositional self-control by self-consciousness interactions on gratitude expression controlling for depletion condition in logistic regression (all subjects)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.45	2.43	0.03	.852	0.64	
Dispositional Self-Control	0.14	0.75	0.03	.856	1.15	0.26, 4.95
SR	-0.06	0.72	0.01	.929	0.94	0.23, 3.84
Depletion Condition	-0.14	0.41	0.11	.742	0.87	0.39, 1.96
Dispositional Self-Control _X_SR	-0.09	0.24	0.14	.707	0.92	0.58, 1.45
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-1.46	3.25	0.20	.653	0.23	
Dispositional Self-Control	0.56	1.06	0.28	.598	1.74	0.22, 13.8
ISA	0.15	0.82	0.03	.857	1.16	0.23, 5.77
Depletion Condition	-0.29	0.40	0.50	.478	0.75	0.34, 1.66
Dispositional Self-Control _X_ISA	-0.15	0.27	0.32	.570	0.86	0.51, 1.45
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-2.27	3.05	0.55	.457	0.10	
Dispositional Self-Control	0.30	0.92	0.11	.740	1.36	0.22, 8.17
PSC	0.32	0.76	0.18	.668	1.38	0.31, 6.08
Depletion Condition	-0.29	0.41	0.50	.478	0.75	0.34, 1.66
Dispositional Self-Control _X_PSC	-0.08	0.24	0.11	.740	0.92	0.58, 1.47
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	1.88	2.55	0.55	.459	6.58	
Dispositional Self-Control	-0.74	0.81	0.83	.362	0.48	0.10, 2.34
SA	-0.79	0.72	1.20	.273	0.45	0.11, 1.87
Depletion Condition	-0.24	0.41	0.36	.550	0.78	0.35, 1.74
Dispositional Self-Control _X_SA	0.20	0.24	0.68	.409	1.22	0.76, 1.95

Table 38

Study 3: Depletion condition by self-consciousness interactions on gratitude expression in logistic regression (excluding suspicious participants and outliers)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	0.58	1.00	0.34	.561	1.79	
SR	-0.27	0.41	0.45	.504	0.76	0.34, 1.69
Depletion Condition	-1.09	1.74	0.39	.531	0.34	0.01, 10.22
Depletion Condition _X_SR	-0.30	0.53	0.32	.571	0.74	0.26, 2.08
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	1.24	1.47	0.70	.402	3.44	
ISA	-0.31	0.41	0.59	.442	0.73	0.33, 1.63
Depletion Condition	-1.46	2.18	0.45	.502	0.23	0.00, 16.56
Depletion Condition _X_ISA	-0.30	0.56	0.29	.592	0.74	0.25, 2.23
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-1.36	1.26	1.15	.283	0.26	
PSC	-0.05	0.35	0.02	.892	0.95	0.48, 1.9
Depletion Condition	0.09	1.89	0.00	.962	1.10	0.03, 44.48
Depletion Condition _X_PSC	0.11	0.49	0.05	.817	1.12	0.43, 2.90
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.11	0.99	0.01	.913	0.90	
SA	-0.39	0.36	1.18	.278	0.68	0.33, 1.37
Depletion Condition	-0.02	1.59	0.00	.992	0.99	0.04, 21.98
Depletion Condition _X_SA	0.08	0.47	0.03	.869	1.08	0.43, 2.72

Table 39

Study 3: Depletion condition by self-consciousness interactions on gratitude expression in logistic regression (all subjects)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	0.08	0.88	0.01	.923	1.09	
SR	-0.19	0.32	0.35	.556	0.83	0.44, 1.56
Depletion Condition	-0.71	1.44	0.24	.624	0.49	0.03, 8.32
Depletion Condition _X_SR	-0.17	0.43	0.16	.688	0.84	0.36, 1.95
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	1.15	1.39	0.69	.406	3.16	
ISA	-0.05	0.34	0.02	.876	0.95	0.48, 1.86
Depletion Condition	-2.22	1.97	1.27	.259	0.11	0.00, 5.13
Depletion Condition _X_ISA	-0.50	0.49	1.03	.311	0.61	0.23, 1.59
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-1.27	1.10	1.33	.249	0.28	
PSC	0.10	0.31	0.10	.747	1.1	0.61, 2.01
Depletion Condition	-0.40	1.66	0.06	.809	0.67	0.03, 17.2
Depletion Condition _X_PSC	-0.03	0.42	0.01	.941	0.97	0.42, 2.22
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.19	0.88	0.05	.828	0.82	
SA	-0.12	0.30	0.16	.685	0.89	0.49, 1.60
Depletion Condition	-0.67	1.38	0.24	.627	0.51	0.03, 7.64
Depletion Condition _X_SA	-0.14	0.40	0.11	.736	0.87	0.40, 1.92

Table 40

Study 3: State self-control by self-consciousness interactions on gratitude expression controlling for depletion condition in logistic regression (excluding suspicious participants and outliers)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	1.16	3.55	0.11	.744	3.18	
State Self-Control	-0.13	0.71	0.03	.853	0.88	0.22, 3.49
SR	-0.46	1.07	0.19	.664	0.63	0.08, 5.10
Depletion Condition	-0.17	0.48	0.13	.723	0.84	0.33, 2.17
State Self-Control _X_SR	-0.02	0.23	0.01	.933	0.98	0.63, 1.53
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	7.36	5.10	2.08	.149	1573.90	
State Self-Control	-1.38	1.04	1.77	.184	0.25	0.03, 1.93
ISA	-2.15 [†]	1.30	2.72	.099	0.12	0.01, 1.50
Depletion Condition	-0.41	0.48	0.75	.388	0.66	0.26, 1.68
State Self-Control _X_ISA	0.35	0.27	1.72	.190	1.42	0.84, 2.39
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	2.05	4.22	0.24	.627	7.77	
State Self-Control	-0.68	0.87	0.62	.431	0.51	0.09, 2.76
PSC	-0.82	1.05	0.60	.438	0.44	0.06, 3.48
Depletion Condition	-0.36	0.46	0.60	.439	0.70	0.28, 1.73
State Self-Control _X_PSC	0.18	0.22	0.65	.421	1.20	0.77, 1.86
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	4.91	3.68	1.78	.182	135.36	
State Self-Control	-0.96	0.72	1.78	.182	0.38	0.09, 1.57
SA	-1.62	1.05	2.38	.123	0.20	0.03, 1.55
Depletion Condition	-0.34	0.47	0.52	.472	0.71	0.28, 1.79
State Self-Control _X_SA	0.25	0.21	1.39	.238	1.29	0.85, 1.95

Table 41

Study 3: State self-control by self-consciousness interactions on gratitude expression controlling for depletion condition in logistic regression (all subjects)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-0.60	2.97	0.04	.840	0.55	
State Self-Control	0.10	0.58	0.03	.860	1.11	0.36, 3.42
SR	-0.14	0.87	0.03	.869	0.87	0.16, 4.74
Depletion Condition	-0.17	0.41	0.17	.676	0.84	0.37, 1.89
State Self-Control _X_SR	-0.03	0.18	0.03	.858	0.97	0.69, 1.37
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	6.54	4.63	1.99	.158	689.63	
State Self-Control	-1.29	0.92	1.96	.162	0.27	0.04, 1.68
ISA	-1.97†	1.15	2.93	.087	0.14	0.01, 1.33
Depletion Condition	-0.33	0.41	0.65	.421	0.72	0.32, 1.61
State Self-Control _X_ISA	0.34	0.23	2.23	.135	1.41	0.90, 2.20
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	0.32	3.45	0.01	.927	1.37	
State Self-Control	-0.37	0.70	0.29	.593	0.69	0.17, 2.71
PSC	-0.45	0.86	0.28	.598	0.64	0.12, 3.43
Depletion Condition	-0.29	0.41	0.51	.475	0.75	0.34, 1.66
State Self-Control _X_PSC	0.12	0.18	0.48	.488	1.13	0.80, 1.60
	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	1.91	2.97	0.41	.520	6.76	
State Self-Control	-0.46	0.58	0.65	.421	0.63	0.20, 1.95
SA	-0.93	0.85	1.20	.274	0.40	0.08, 2.08
Depletion Condition	-0.24	0.41	0.36	.549	0.78	0.35, 1.74
State Self-Control _X_SA	0.15	0.17	0.80	.370	1.16	0.84, 1.62

Table 42

Study 3: Gender differences in gratitude expression, gratitude feelings, and indebtedness feelings

	Males			Females			<i>t</i>	<i>p</i>
	M	n	SD	M	n	SD		
Gratitude expression (0= did not express, 1= expressed)	0.05	19	0.23	0.25	96	0.44	-1.92†	.057
Feelings of Gratitude	3.48	18	1.59	3.65	96	1.91	-0.36	.721
Feelings of Indebtedness	1.75	18	1.53	1.55	96	1.50	0.51	.610

Table 43

Study 3: Main effect of gender on gratitude expression in logistic regression (excluding suspicious participants and outliers)

	B	S.E.	Wald	Sig.	Odds Ratio	95% CI
Constant	-1.10***	0.24	21.73	<.001	0.33	
Gender	-1.79†	1.05	2.89	.089	0.17	0.02, 1.32

Table 44

Studies 1-3: Summary of hypotheses tests

Main effects hypotheses		Study	Supported?
1a	<i>High dispositional self-regulatory capacity is associated with greater willingness to express gratitude to others.</i>	1	Yes
		2	Null
		3	Null
1b	<i>Self-regulatory depletion is associated with less gratitude expression.</i>	1	--
		2	Yes
		3	Null
2a	<i>People higher in public self-consciousness will report lower willingness to express gratitude.</i>	1	Null
		2	Null
		3	Null
2b	<i>People higher in SR private self-consciousness will report lower willingness to express gratitude.</i>	1	Null
		2	Null
		3	Yes
2c	<i>People higher in ISA private self-consciousness will report greater willingness to express gratitude.</i>	1	Yes
		2	Null
		3	Opposite
2d	<i>People higher in social anxiety will report lower willingness to express gratitude.</i>	1	Yes
		2	Yes
		3	Null

Table 44 Continued

Interaction effects hypotheses		Study	Supported?
3a	<i>People higher in public self-consciousness will have a positive association between self-regulatory capacity and willingness to express gratitude.</i>	1	Null
		2	Null
		3	Null
3b	<i>People higher in SR private self-consciousness will have a positive association between self-regulatory capacity and willingness to express gratitude.</i>	1	Null
		2	Null
		3	Null
3c	<i>People lower in ISA private self-consciousness will have a positive association between self-regulatory capacity and willingness to express gratitude.</i>	1	Null
		2	Null
		3	Null
3d	<i>People higher in social anxiety will have a positive association between self-regulatory capacity and willingness to express gratitude.</i>	1	Opposite
		2	Null
		3	Null
4a	<i>Self-regulatory depletion will be associated with less willingness to express gratitude to others for individuals who are higher in public self-consciousness relative to individuals who are lower in public self-consciousness.</i>	1	--
		2	Null
		3	Null
4b	<i>Self-regulatory depletion will be associated with less willingness to express gratitude to others for individuals who are higher in SR private self-consciousness relative to individuals who are lower in SR private self-consciousness.</i>	1	--
		2	Null
		3	Null
4c	<i>Self-regulatory depletion will be associated with less willingness to express gratitude to others for individuals who are lower in ISA private self-consciousness relative to individuals who are higher in ISA private self-consciousness.</i>	1	--
		2	Opposite
		3	Null
4d	<i>Self-regulatory depletion will be associated with less willingness to express gratitude to others for individuals who are higher in social anxiety relative to individuals who are lower in social anxiety.</i>	1	--
		2	Null
		3	Null

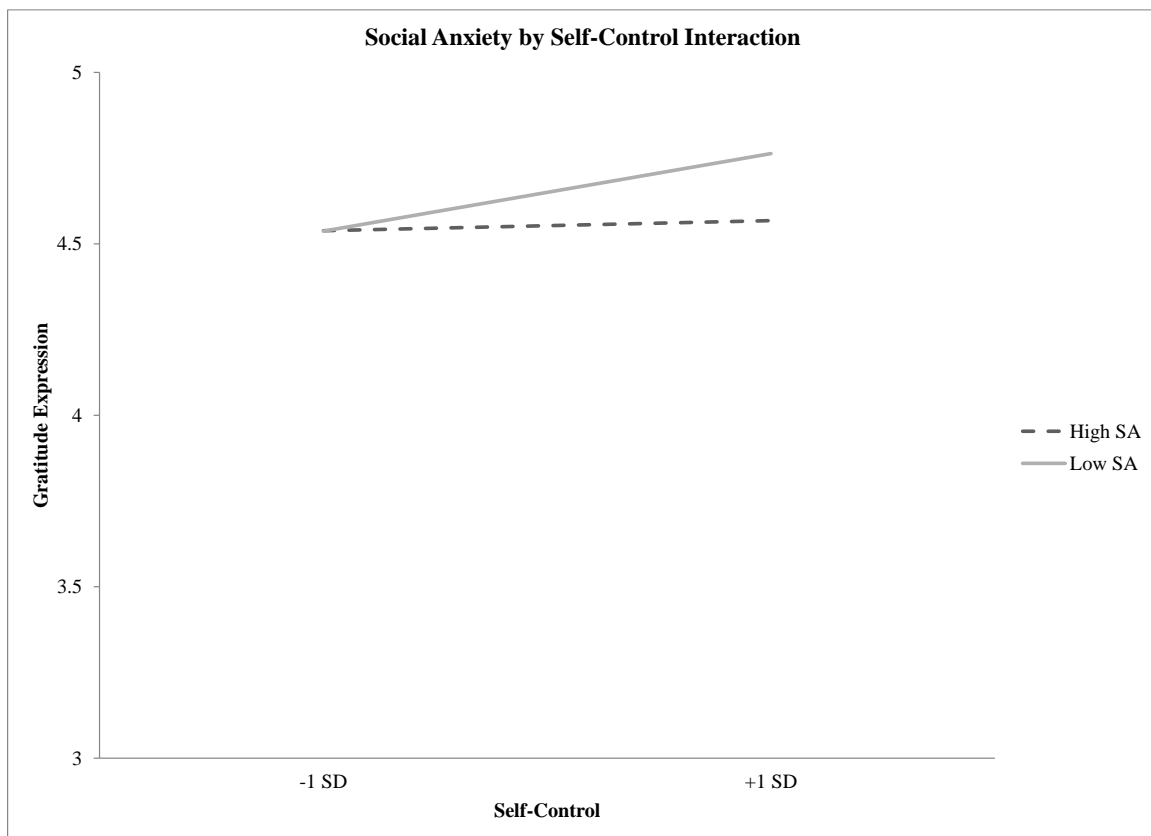


Figure 1. Study 1: Simple slopes graph for the interaction between social anxiety and self-control on gratitude expression.

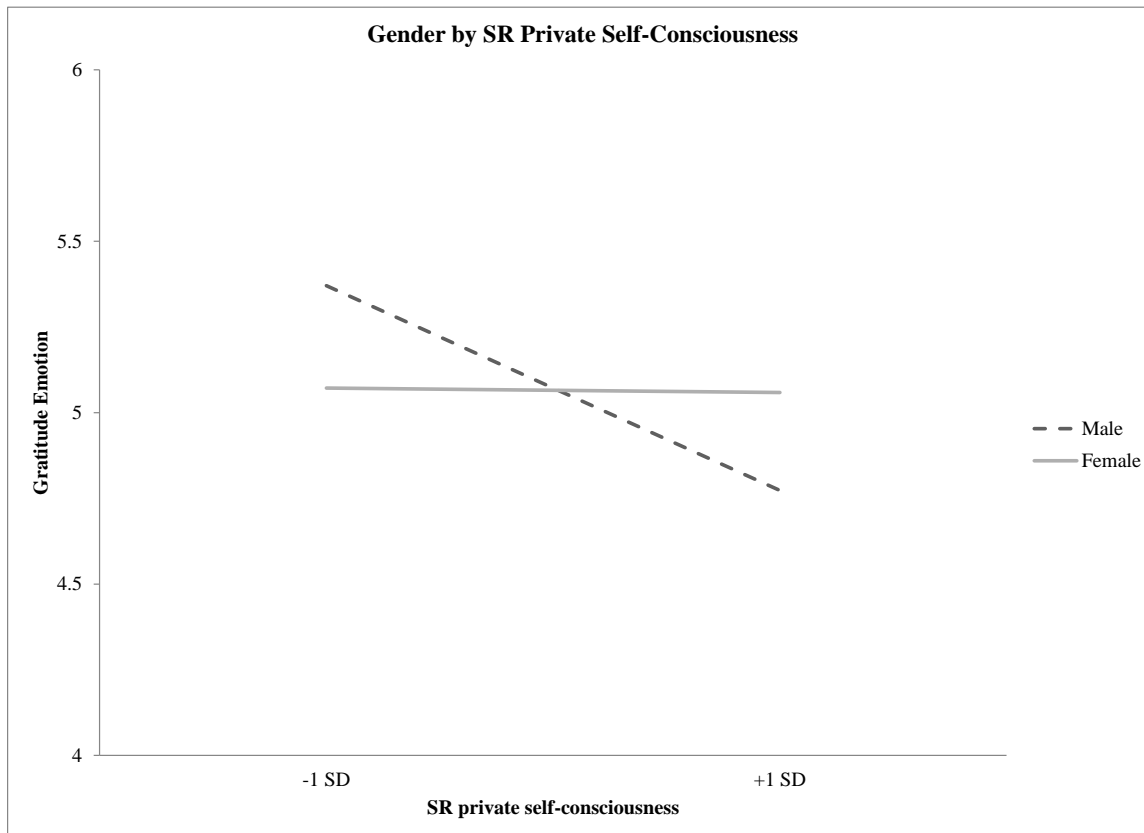


Figure 2. Study 1: Simple slopes graph for the interaction between gender by self-reflective private self-consciousness on gratitude emotion.

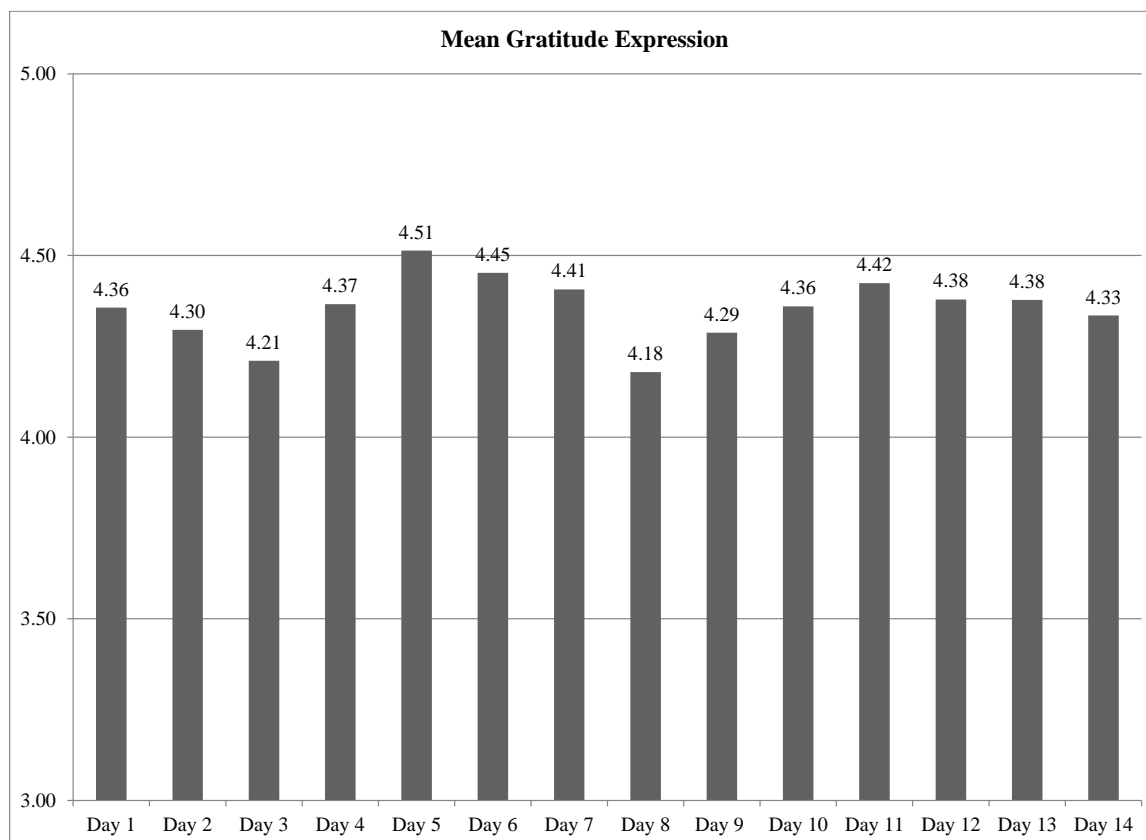


Figure 3. Study 2: Frequency of gratitude expression across diary days.

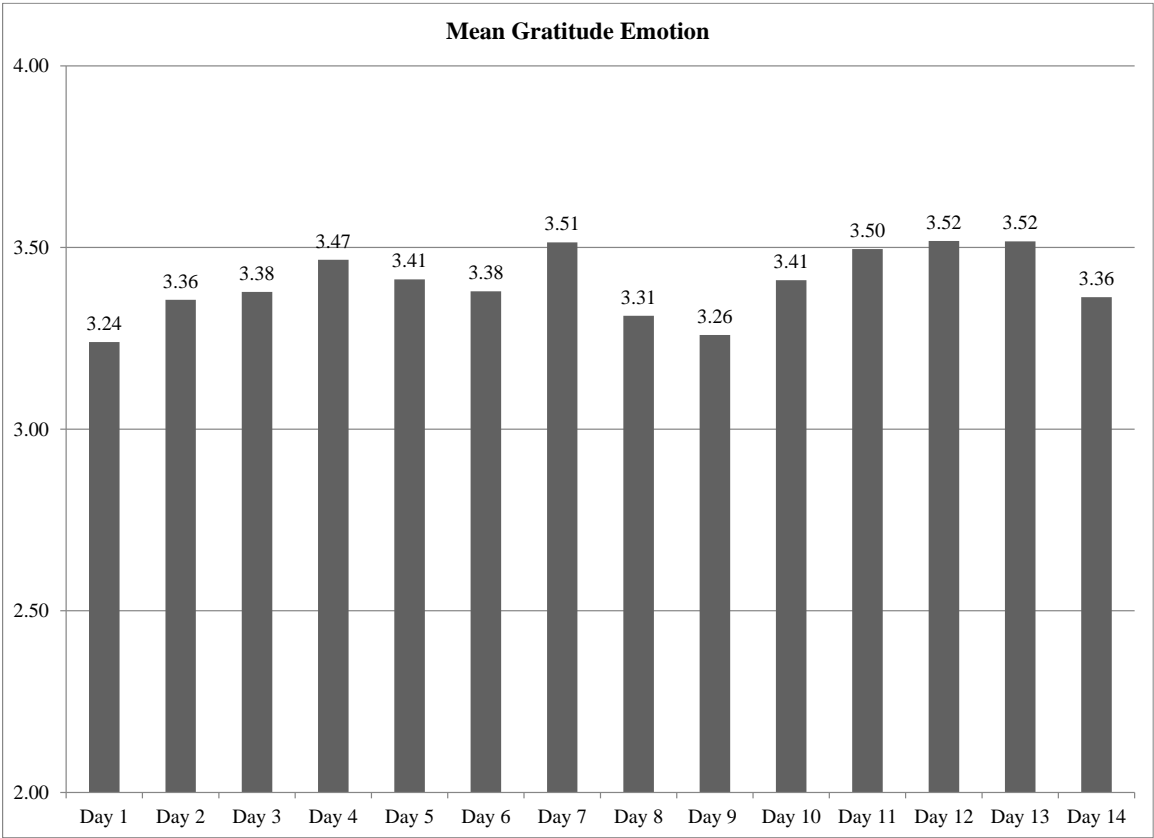


Figure 4. Study 2: Frequency of feeling grateful across diary days.

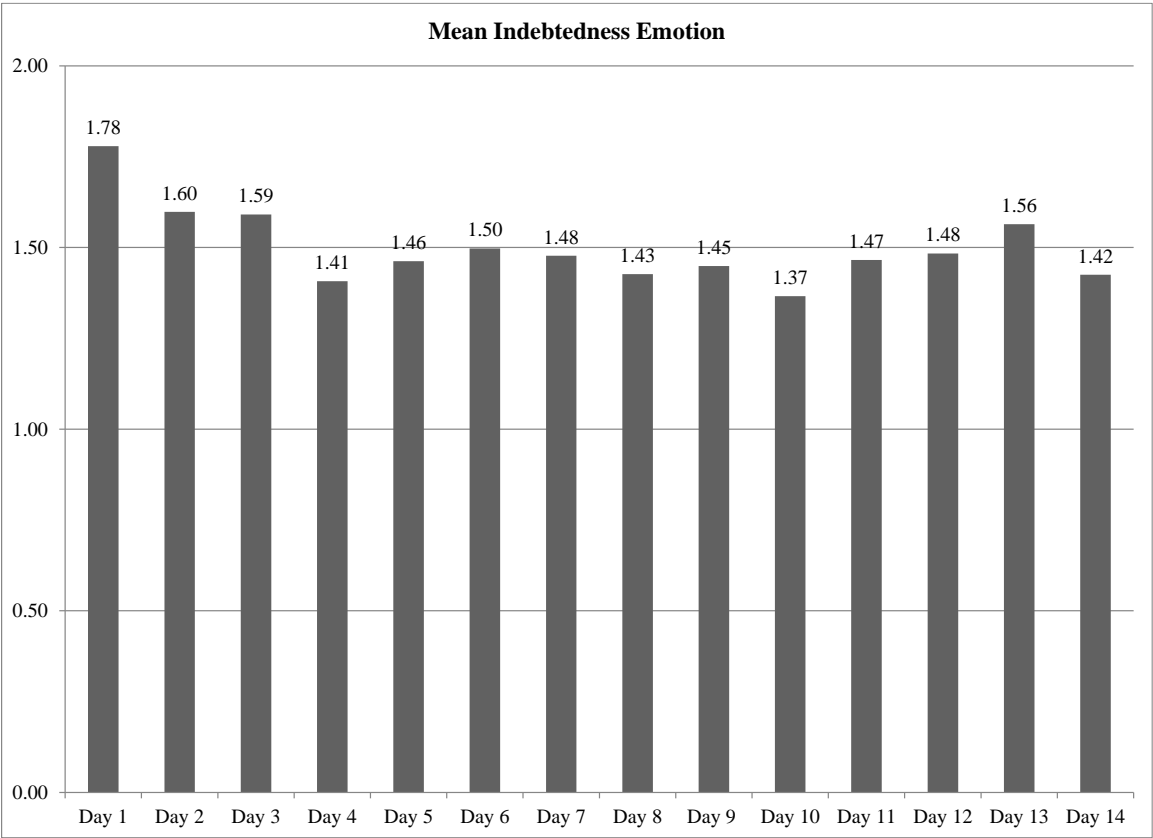


Figure 5. Study 2: Frequency of feeling indebted across diary days.

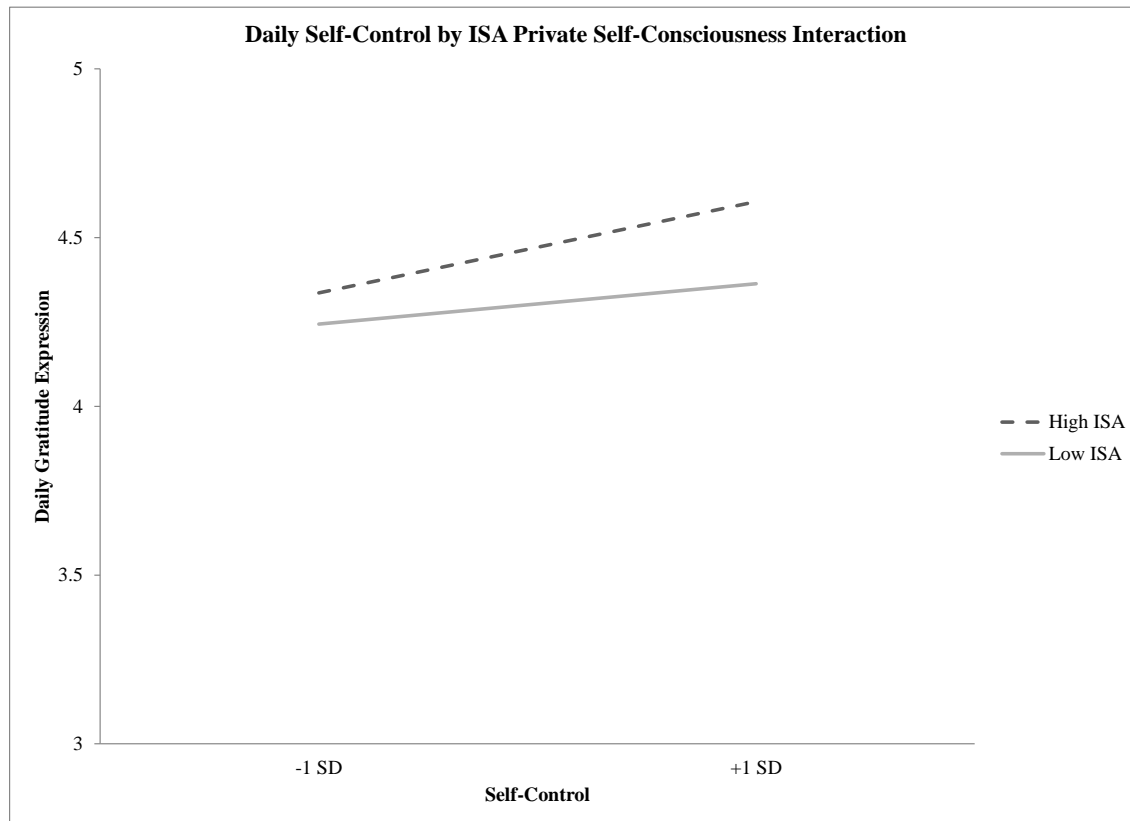


Figure 6. Study 2: Simple slopes graph for the interaction between daily self-control and ISA private self-consciousness on gratitude expression.

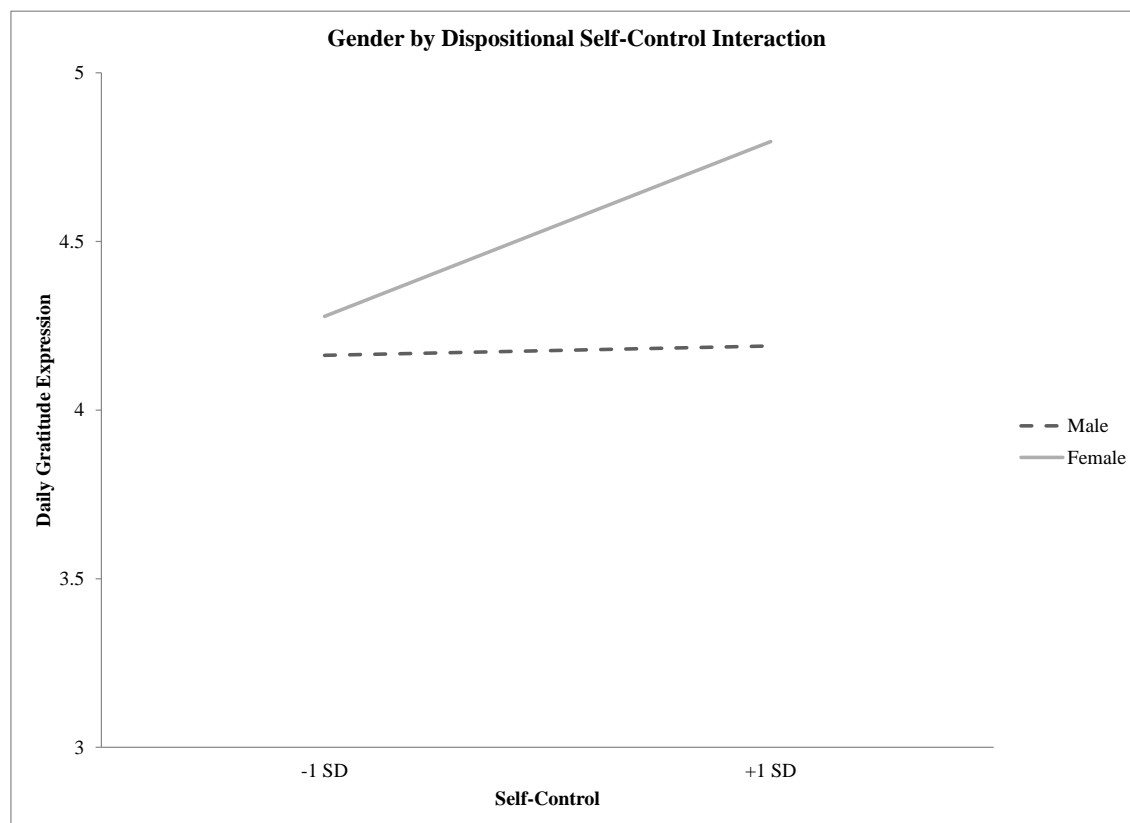


Figure 7. Study 2: Simple slopes graph for the interaction between dispositional self-control and gender on gratitude expression.

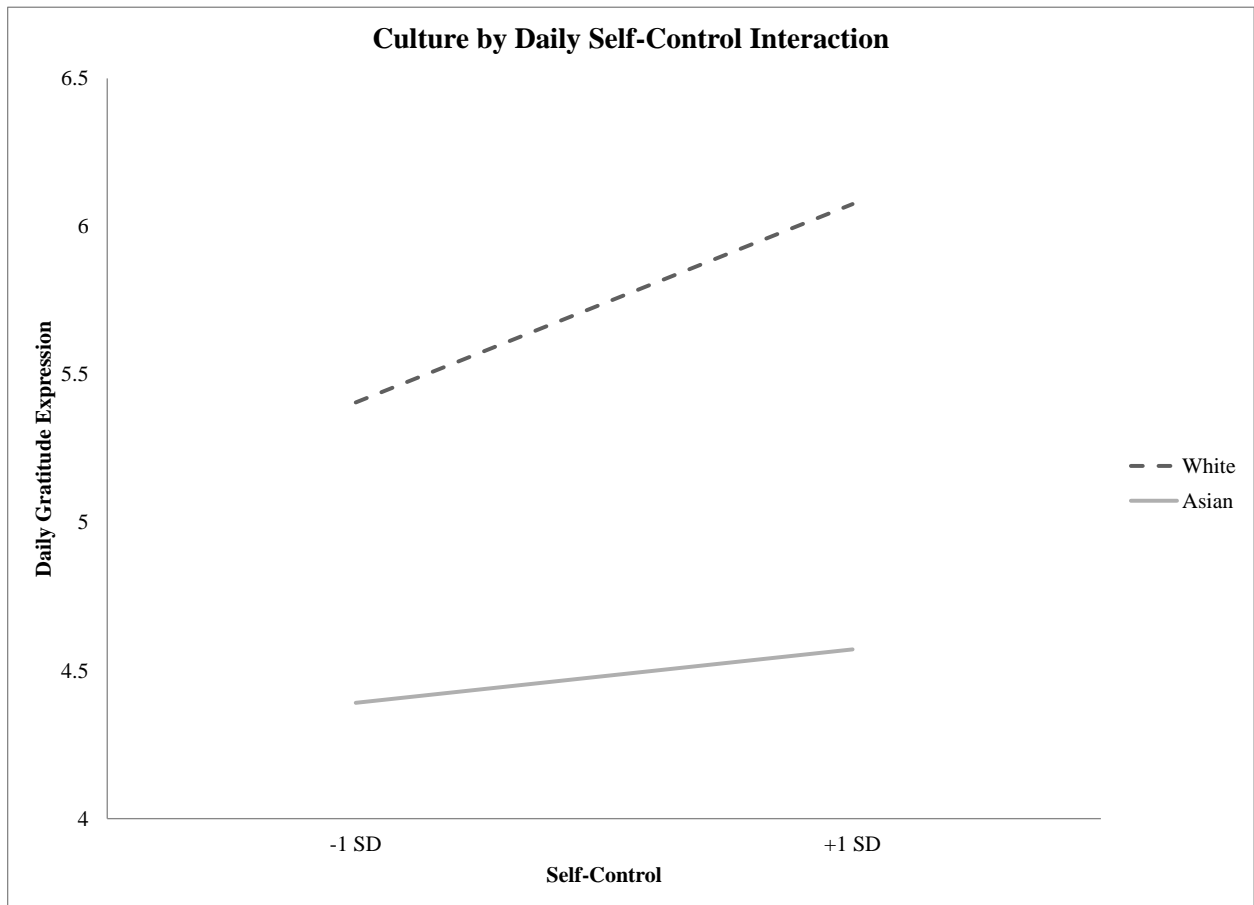


Figure 8. Study 2: Simple slopes graph for the interaction between culture and daily self-control on gratitude expression.

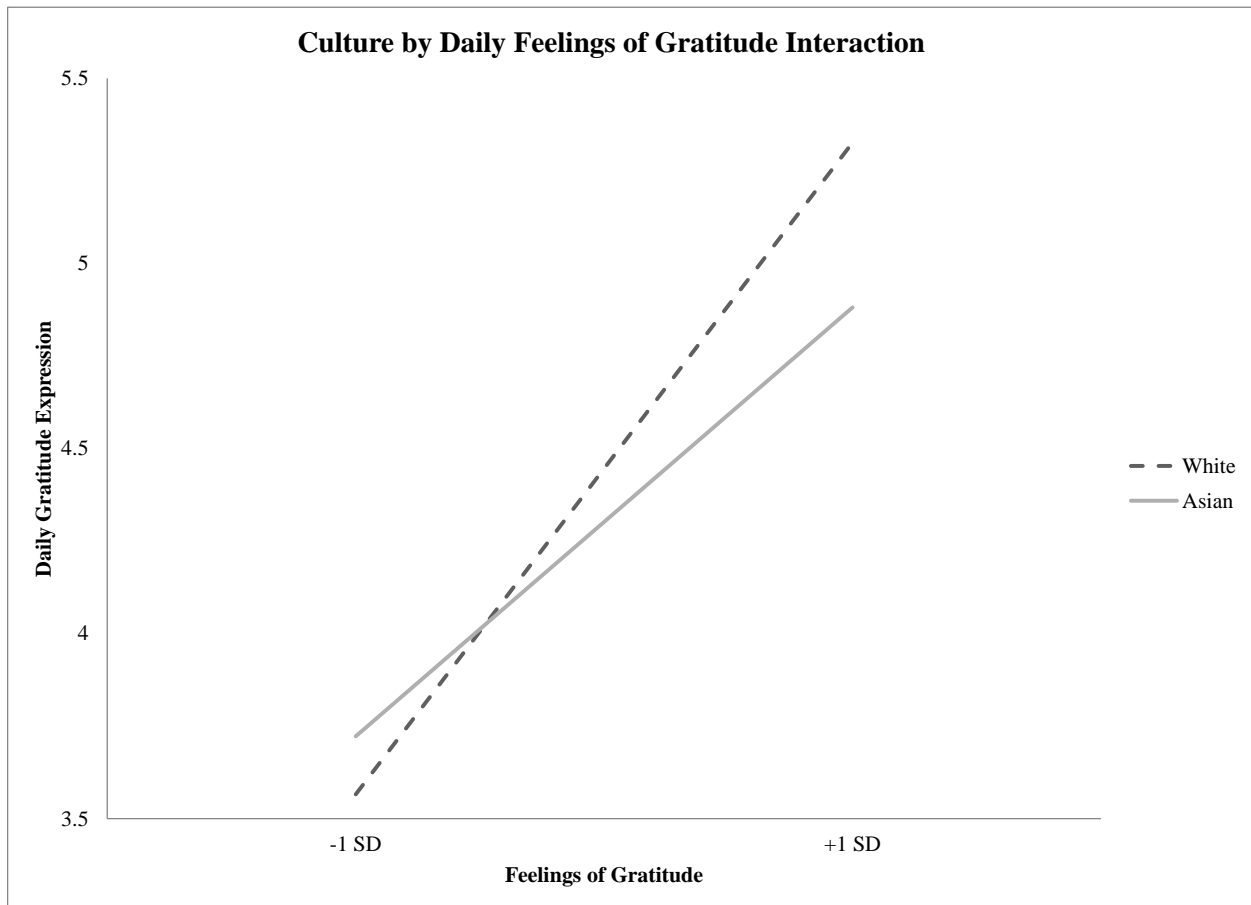


Figure 9. Study 2: Simple slopes graph for the interaction between culture and feelings of gratitude on gratitude expression.

Appendix A

Expression of Gratitude in Relationships Measure

- | Never | | | | | Very frequently |
|--|---|---|---|---|-----------------|
| 1 | 2 | 3 | 4 | 5 | |
| 1. I express my appreciation for the things that my partner does for me. | | | | | |
| 2. I let my partner know that I value him/her. | | | | | |
| 3. When my partner does something nice for me I acknowledge it. | | | | | |

Gratitude & Indebtedness

People feel many different things as a result of others' actions on any given day or at any given time. Please indicate how each item describes how you feel as a result of your romantic partners' actions toward you.

- | Not at all | | | | | | Very much |
|-----------------|---|---|---|---|---|-----------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 1. Grateful | | | | | | |
| 2. Thankful | | | | | | |
| 3. Appreciative | | | | | | |
| 4. Indebted | | | | | | |
| 5. Obligated | | | | | | |

Trait Self-Control Scale

Using the scale provided, please indicate how much each of the following statements reflect how you typically are.

- | Not at all | | | | | Very much |
|--|---|---|---|---|-----------|
| 1 | 2 | 3 | 4 | 5 | |
| 1. I am good at resisting temptation. | | | | | |
| 2. I have a hard time breaking bad habits. | | | | | |
| 3. I am lazy. | | | | | |
| 4. I say inappropriate things. | | | | | |
| 5. I do certain things that are bad for me, if they are fun. | | | | | |
| 6. I refuse things that are bad for me. | | | | | |
| 7. I wish I had more self-discipline. | | | | | |
| 8. People would say that I have iron self-discipline. | | | | | |
| 9. Pleasure and fun sometimes keep me from getting work done. | | | | | |
| 10. I have trouble concentrating. | | | | | |
| 11. I am able to work effectively toward long-term goals. | | | | | |
| 12. Sometimes I can't stop myself from doing something, even if I know it's wrong. | | | | | |
| 13. I often act without thinking through all the alternatives. | | | | | |

Public and Private Self Consciousness Scale (abbreviated)

Extremely uncharacteristic					Extremely characteristic
0	1	2	3	4	
Self-reflectiveness (SR)					
1. I'm always trying to figure myself out.					
2. I'm constantly examining my motives.					
3. I sometimes have the feeling that I'm off somewhere watching myself.					
Internal state awareness (ISA)					
4. I reflect about myself a lot.					
5. I'm generally attentive to my inner feelings.					
6. I'm alert to changes in my mood.					
Public self-consciousness					
7. I'm concerned about the way I present myself.					
8. I usually worry about making a good impression.					
9. I'm usually concerned about what other people think of me.					
Social Anxiety					
10. It takes me time to overcome my shyness in new situations.					
11. I get embarrassed very easily.					
12. Large groups make me nervous.					

CSI (4-item)

Please indicate the degree of happiness, all things considered, of your relationship.

Extremely unhappy	Fairly unhappy	A little unhappy	Happy	Very happy	Extremely happy	Perfect
0	1	2	3	4	5	6
I have a warm and comfortable relationship with my partner						
Not at all true	A little true	Somewhat true	Mostly true	Almost completely true	Completely true	
0	1	2	3	4	5	
How rewarding is your relationship with your partner?						
Not at all	A little	Somewhat	Mostly	Almost completely	Completely	
0	1	2	3	4	5	
In general, how satisfied are you with your relationship?						
Not at all	A little	Somewhat	Mostly	Almost completely	Completely	
0	1	2	3	4	5	

Communal strength measure

Keeping in mind your romantic partner, answer the following questions.

- | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|-----------|
| Not at all | | | | | | | | | | Extremely |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
1. How far would you be willing to go to visit your romantic partner?
 2. How happy do you feel when doing something that helps your romantic partner?
 3. How large a benefit would you be likely to give your romantic partner?
 4. How large a cost would you incur to meet a need of your romantic partner?
 5. How readily can you put the needs of your romantic partner out of your thoughts?
 6. How high a priority for you is meeting the needs of your romantic partner?
 7. How reluctant would you be to sacrifice for your romantic partner?
 8. How much would you be willing to give up to benefit your romantic partner?
 9. How far would you go out of your way to do something for your romantic partner?
 10. How easily could you accept not helping your romantic partner?

Self-Esteem Scale

The following statements concern your perceptions of yourself. We are interested in how you generally feel. Respond to each statement by indicating how much you agree or disagree with it. Write the number in the space provided, using the following rating scale.

- | | | | | | | | | |
|----------------------|---|---|---|-------------------|---|---|--|-------------------|
| Strongly
Disagree | | | | Neutral/
Mixed | | | | Strongly
Agree |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
1. I feel that I am a person of worth, at least on an equal plane with others.
 2. I feel like a person who has a number of good qualities.
 3. All in all, I am inclined to feel like a failure.
 4. I feel as if I am able to do things as well as most other people.
 5. I feel as if I do not have much to be proud of.
 6. I take a positive attitude toward myself.
 7. I wish that I could have more respect for myself.
 8. On the whole, I am satisfied with myself.
 9. I certainly feel useless at times.
 10. At times I think that I am no good at all.

Dyadic trust scale

Strongly Disagree			Neutral/ Mixed			Strongly Agree
1	2	3	4	5	6	7
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						

Quality of Alternatives Facet and Global Items

1. Please indicate the degree to which you agree with each statement regarding the fulfillment of each need in alternative relationships (e.g., by another dating partner, friends, family).

Don't At All Agree	Agree Slightly	Agree Moderately	Agree Completely
1	2	3	4
(a) My needs for intimacy (sharing personal thoughts, secrets, etc.) could be fulfilled in alternative relationships			
(b) My needs for companionship (doing things together, enjoying each other's company, etc.) could be fulfilled in alternative relationships			
(c) My sexual needs (holding hands, kissing, etc.) could be fulfilled in alternative relationships			
(d) My needs for security (feeling trusting, comfortable in a stable relationship, etc.) could be fulfilled in alternative relationships			
(e) My needs for emotional involvement (feeling emotionally attached, feeling good when another feels good, etc.) could be fulfilled in alternative relationships			

- | | | | | | | | | | | | | | | | | | | | | |
|------------------------|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|-------------------|--|------------------|
| Do not agree at
all | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | Agree
somewhat | | Agree completely |
|------------------------|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|-------------------|--|------------------|
2. The people other than my partner with whom I might become involved are very appealing (please circle a number).
 3. My alternatives to our relationship are close to ideal (dating another, spending time with friends or on my own, etc.).
 4. If I weren't dating my partner, I would do fine-I would find another appealing person to date.
 5. My alternatives are attractive to me (dating another, spending time with friends or on my own, etc.).
 6. My needs for intimacy, companionship, etc., could easily be fulfilled in an alternative relationship.

Commitment Measure

To what extent does each of the following statements describe your feelings regarding your relationship?

- | | | | | | | | | | | | | | | | | | | | | |
|------------------------|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|-------------------|--|------------------|
| Do not agree at
all | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | Agree
somewhat | | Agree completely |
|------------------------|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|-------------------|--|------------------|
- 0
 - 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
 1. I will do everything I can to make our relationship last for the rest of our lives.
 2. I feel completely attached to my partner and our relationship.
 3. I often talk to my partner about what things will be like when we are very old.
 4. I feel really awful when things are not going well in our relationship.
 5. I am completely committed to maintaining our relationship.
 6. I frequently imagine life with my partner in the distant future.
 7. When I make plans about future events in life, I carefully consider the impact of my decisions on our relationship.
 8. I spend a lot of time thinking about the future of our relationship.
 9. I feel really terrible when things are not going well for my partner.
 10. I want our relationship to last forever.
 11. There is no chance at all that I would ever become romantically involved with another person.
 12. I am oriented toward the long-term future of our relationship (for example, I imagine life with my partner decades from now).
 13. My partner is more important to me than anyone else in life – more important than my parents, friends, etc.
 14. I intend to do everything humanly possible to make our relationship persist.
 15. If our relationship were ever to end, I would feel that my life was destroyed.

Trait Self-Control Scale

Using the scale provided, please indicate how much each of the following statements reflect how you typically are.

- | | | | | | |
|------------|---|---|---|--|-----------|
| Not at all | | | | | Very much |
| 1 | 2 | 3 | 4 | | 5 |
1. I am good at resisting temptation.
 2. I have a hard time breaking bad habits.
 3. I am lazy.
 4. I say inappropriate things.
 5. I do certain things that are bad for me, if they are fun.
 6. I refuse things that are bad for me.
 7. I wish I had more self-discipline.
 8. People would say that I have iron self-discipline.
 9. Pleasure and fun sometimes keep me from getting work done.
 10. I have trouble concentrating.
 11. I am able to work effectively toward long-term goals.
 12. Sometimes I can't stop myself from doing something, even if I know it's wrong.
 13. I often act without thinking through all the alternatives.

Nightly Survey

State Self-Control Capacity Scale (SSCCS)

Please indicate the extent to which you felt each of the following TODAY:

- | | | | | | | |
|------------|---|---|----------|---|---|--------------|
| Not at all | | | Somewhat | | | A great deal |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
1. Right now, I need something pleasant to make me feel better.
 2. Right now, I feel drained.
 3. Right now, if I were tempted by something it would be very difficult to resist.
 4. Right now, I would want to quit any difficult task I were given.
 5. Right now, I feel calm and rational.
 6. Right now, I can't absorb any more information.
 7. Right now, I feel lazy.
 8. Right now, I feel sharp and focused.
 9. Right now, I want to give up.
 10. Right now, I feel like my willpower is gone.

Compared to other days at college, how stressful was TODAY?

- | | | | | | | |
|-------------------|---|---|---------|---|---|-------------------|
| Less
stressful | | | Average | | | More
stressful |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Social anxiety

- | | | | | | | | |
|------------|---|---|---|----------|---|---|--------------|
| Not at all | | | | Somewhat | | | A great deal |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
1. Today, I felt nervous, even in casual get-togethers.
 2. Today, I felt comfortable with other people.
 3. Today, talking to other people made feel anxious and uncomfortable.
 4. Today, I felt shy in social interactions.
 5. Today, I felt relaxed around other people.

Feelings of gratitude and indebtedness

People feel many different things as a result of others' actions on any given day or at any given time. Please indicate how each item describes how you feel as a result of your friends' actions toward you throughout the day.

- | | | | | | | |
|------------|---|---|---|----------|---|--------------|
| Not at all | | | | Somewhat | | A great deal |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
1. Grateful
 2. Thankful
 3. Appreciative
 4. Indebted
 5. Obligated

Gratitude expression

- | | | | | | | |
|------------|---|---|---|----------|---|--------------|
| Not at all | | | | Somewhat | | A great deal |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
1. Today, I expressed my appreciation for the things that my friends did for me.
 2. Today, I let my friends know that I value them.
 3. Today, when my friends did something nice for me I acknowledged it.

Appendix C

Individual difference measures

Trait Self-Control Scale

Using the scale provided, please indicate how much each of the following statements reflect how you typically are.

- | Not at all | | | | | Very much |
|------------|---|---|---|---|--|
| 1 | 2 | 3 | 4 | 5 | |
| 1. | | | | | I am good at resisting temptation. |
| 2. | | | | | I have a hard time breaking bad habits. |
| 3. | | | | | I am lazy. |
| 4. | | | | | I say inappropriate things. |
| 5. | | | | | I do certain things that are bad for me, if they are fun. |
| 6. | | | | | I refuse things that are bad for me. |
| 7. | | | | | I wish I had more self-discipline. |
| 8. | | | | | People would say that I have iron self-discipline. |
| 9. | | | | | Pleasure and fun sometimes keep me from getting work done. |
| 10. | | | | | I have trouble concentrating. |
| 11. | | | | | I am able to work effectively toward long-term goals. |
| 12. | | | | | Sometimes I can't stop myself from doing something, even if I know it's wrong. |
| 13. | | | | | I often act without thinking through all the alternatives. |

Public and Private Self Consciousness Scale (abbreviated)

- | Extremely
uncharacteristic | | | | | Extremely
characteristic |
|---------------------------------------|---|---|---|---|--|
| 0 | 1 | 2 | 3 | 4 | |
| Self-reflectiveness (SR) | | | | | |
| 1. | | | | | I'm always trying to figure myself out. |
| 2. | | | | | I'm constantly examining my motives. |
| 3. | | | | | I sometimes have the feeling that I'm off somewhere watching myself. |
| Internal state awareness (ISA) | | | | | |
| 4. | | | | | I reflect about myself a lot. |
| 5. | | | | | I'm generally attentive to my inner feelings. |
| 6. | | | | | I'm alert to changes in my mood. |
| Public self-consciousness | | | | | |
| 7. | | | | | I'm concerned about the way I present myself. |
| 8. | | | | | I usually worry about making a good impression. |
| 9. | | | | | I'm usually concerned about what other people think of me. |
| Social Anxiety | | | | | |
| 10. | | | | | It takes me time to overcome my shyness in new situations. |

11. I get embarrassed very easily.
12. Large groups make me nervous.

Lab survey measures

State self-control

Please respond to the statements below, describing how you feel right now (not usually). We are interested in your feelings at this moment. Using the scale below, choose one response (one number) for how much each statement is currently applies to you.

Not true			Neutral			Very true
1	2	3	4	5	6	7
1. I need something pleasant to make me feel better.						
2. I feel drained.						
3. If I were tempted by something right now, it would be very difficult to resist.						
4. I would want to quit any difficult task I were given.						
5. I feel calm and rational.						
6. I can't absorb any more information.						
7. I feel lazy.						
8. I feel sharp and focused.						
9. I want to give up.						
10. I feel like my willpower is gone.						

Feelings of gratitude and indebtedness

People feel many different things as a result of others' actions on any given day or at any given time. For each item use the scale below and write next to each item response that indicates how you feel as a result of the other participant.

Not at all						Very much
0	1	2	3	4	5	6
1. Grateful						
2. Thankful						
3. Appreciative						
4. Indebted						
5. Obligated						

Why do you think the other participant volunteered to do the speech task?

He/She
was very
concerned
about me

He/She
was
motivated
by selfish
reasons

1 2 3 4 5 6 7

How much personal cost did the other participant incur by volunteering to do the speech task?

Very little
cost

Very great
cost

1 2 3 4 5 6 7

How much do you personally value the other participant volunteering to do the speech task?

Very little

Very
much

1 2 3 4 5 6 7

How much did you want to complete the speech task?

Very little

Very
much

1 2 3 4 5 6 7

How happy were you when you realized you did not have to complete the speech task?

Not very
happy

Very
happy

1 2 3 4 5 6 7

Debriefing questions

What did you think the purpose or goal of this study was?

Do you think the first task might have influenced your behavior in the next activity?

Did you think anything was suspicious about this study?

Appendix D

Audio coding procedure

For this coding there are 110 audio transcriptions. These transcriptions are part of a study examining whether or not people express gratitude after someone volunteers to do a stressful task for them. In other words, do people say thanks when others provide a favor or benefit?

For this coding, please make sure to work on the task alone. If you are uncertain about how to code something, please make a note and email me. If any part of these instructions is unclear to you, let me know and I will make sure to provide clarification. Additionally, if any of the transcriptions you code seem ambiguous and you aren't sure how to code them, email me and we'll further discuss how to go about coding them.

Description of the audio transcriptions

The audio transcriptions consist of interactions between the experimenter (E2), the participant (P), and the confederate (C), who is another research assistant playing the role of a participant. The experimenter's scripted instructions are not included in the audio transcriptions. Something to note is that the original audio recordings were transcribed in order to remain anonymity. Sometimes names, places, and organizations are labeled with letters (e.g., I met person X during a club Y event at place Z).

In this part of the study, the experimenter describes a stressful task to the participant and confederate, which they believe they are both about to complete. The experimenter then discovers that he/she only needs one person to complete the stressful task and asks for one volunteer.

The audio transcriptions you will be coding are the interactions between the participant and confederate after they are told only one of them needs to do the stressful task. The confederate always volunteers to do the stressful task for the participant.

After the confederate volunteers, we are interested in how the participant reacts and what they express verbally to the confederate after the confederate offers to do the stressful task for the participant.

What you'll be coding

There are three different things that we'd like you to code for in the audio transcriptions.

1.) Did the participant express gratitude to the confederate?

Write yes or no in the excel column C, labeled gratitude

What is gratitude: Gratitude is experienced when people feel appreciative in response to receiving a benefit that requires some level of sacrifice or cannot be repaid (Emmons & Crumpler, 2000). Gratitude is considered to be a positive emotional experience.

What to look for when coding: In the audio transcriptions, we'd like you to code for whether or not the participant expresses gratitude to the confederate. The most common way people express gratitude is by saying "Thanks" or "Thank you." Some other examples of gratitude expression include saying things like "I'm glad you're doing this," "I appreciate you doing this," or "You're the best!" The important thing to keep in mind is that gratitude expression focuses on the other person, and the fact that he or she provided a benefit of some kind.

2.) Did the participant express indebtedness to the confederate?

Write yes or no in the excel column D, labeled indebtedness

What is indebtedness: While people often feel positive when a favor is done for them, other times people feel indebted to the giver, which is a relatively negative experience. Indebtedness is characterized by feeling that one has burdened the giver.

What to look for when coding: In the audio transcriptions, we'd like you to code whether or not the participant expresses indebtedness to the confederate. People may express indebtedness by apologizing, saying things like "Sorry," or "I feel bad that you're doing this for me."

3.) Did the participant express positivity or kindness to the confederate in other ways?

Describe what the positive expression was in the excel column E, labeled other positive expressions

Lastly, please make note of whether or not there were other positive expressions directed toward the confederate that you think **might be expressions of gratitude, but are more indirect and do not fit with the definition of gratitude given in these expression.**

Make a note of exactly what the expression is.

There might not always something to write in this column. This is OK! You can just leave it blank if that is the case. This column is meant to be a place to record ambiguous positive responses, that don't seem to fit in the gratitude expression category described above