ACUTE RELATIONAL STRESS AND WILLINGNESS TO HELP: THE INFLUENCE OF STRESS ON PRO-SOCIAL OUTCOMES

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Acute Relational Stress and Willingness to Help: The Influence of
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DEDICATION

I first of all dedicate this thesis to my mother and father who have been a tremendous source of love and support. Secondly, I dedicate this to my advisor who has worked tirelessly to help me complete this thesis. Lastly, I dedicate this to some instrumental people in my past and present that without them I would not be in the position I am currently: Lisa Menegatos, Bud Goodall, Kory Floyd, Belle Edson, Roman Chavez, and Troy Morales.
When I was a boy and I would see scary things in the news, my mother would say to me, “Look for the helpers. You will always find people who are helping.” To this day, especially in times of “disaster,” I remember my mother’s words and I am always comforted by realizing that there are still so many helpers - so many caring people in this world.

--Fred Rodgers
ABSTRACT OF THE THESIS

Acute Relational Stress and Willingness to Help: The Influence of Stress on Pro-Social Outcomes
by
Ryan M. Maliski
Master of Arts in Communication
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Humans are a species that can thirst for and turn towards social relationships in times of stress. The need to belong perspective suggests that loneliness should promote an individual to seek social connections and thus enhance pro-social behavior. In contradiction, some research supports the social exclusion hypothesis, showing increased loneliness will decrease pro-social behavior. Furthermore, tend and befriend theory suggests enhanced pro-social behavior as a result of a stressor, specifically for women. Tend and befriend is also challenged by recent research finding pro-social behavior to manifest in men as a response to a stressor. The aim of the present study was to understand the influence of a relational stressor on pro-social behavior. Additionally, this study re-tested the suggestion that women would be more willing to act pro-socially in response to a stressor than men. The study took place across two discrete rounds of data collection: one in the laboratory and one out-of-laboratory. Results provided mix support for a sex difference in performance of a pro-social behavior. Furthermore, this study revealed mild support for the social exclusion hypothesis. Future research should seek to integrate a writing intervention focused on a personal experience with feeling lonely.
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CHAPTER 1

INTRODUCTION

Humans show a propensity to seek and establish social relationships with other humans (Baumeister & Leary, 1995; Taylor et al., 2000). This is to say that all humans have and have had essential relationships with one another, such as a mother nursing a child. Without this relationship, the child would have bleak survival opportunity (Floyd, Hesse, & Pauley, 2009). With respect to survival an exciting line of research is growing linking affiliation with responses to a threat. Threat will be defined more specifically later, but briefly stated a threat is a source of stress. Taylor (2006) suggests that social affiliation occurs in response to a threat, specifically for women. There is real benefit in the pro-social approach when individuals alternatively seek to “stand together” rather than fighting or fleeing from a threat. It is therefore clear that social bonds can serve as an essential survival function of humans. Social affiliation behaviors are an interaction that may bolster the chance of survival benefits for both a sender and receiver. Although there is an understanding of the importance of the social connections and strengthening of close relationships, there is much to explore about the triggers and motivations for pro-social behaviors. Overall, humans as a species benefit and thrive through social relationships and all the benefits that relationships encompass.

Classically, a response to a threat has been constructed under the framework of fight or flight. Fight or flight is successful for constructing the human response to a threat, but such an explanation clearly does not fully explain humans’ propensity for social connections and helping others in the face of a threat (Taylor et al., 2000). Stress theories confirm that each time a person encounters a stressor, a physiological response system is activated to address the oncoming threat (McEwen, 1998). The physiological response works in concert with cognitive systems to interpret and form a decision/response to the ensuing threat. Existing theories have argued that humans are either motivated to fight a threat or to flee from a threat, but this is clearly not the only explanation. The following will identify the larger theoretical framework that is used to understand humans’ need for relationships and
social interaction. This will be followed by the driving theoretical claims of tend and befriend (Taylor et al., 2000).

**Theoretic Commitments**

In order to place the theoretical commitments into perspective the present aim and terminologies of the study will be identified. The aim of the current study is based on the underlying assumption that all healthy humans at some capacity have a need to belong socially. An important underlying assumption of the need to belong perspective is that a gap in belonging results in compromised health (Baumeister & Leary, 1995). Recent theoretic and empirical studies have demonstrated that belongingness needs can be particularly salient when individuals experience a threat (stress); indeed one such behavior is a pro-social response to a stressor that is rooted in the underlying need to belong (Taylor 2006; Taylor et al., 2000). This logic leads to the present aim of this study: that is, to understand humans’ propensity to act pro-socially towards another in response to a stressor. A classically referenced behavioral response to a stressor is fight-or-flight. An alternative to fight-or-flight is that of tend and befriend (TBT), the suggestion that a stressor will increase an individual’s pro-social tendencies in both women (Taylor et al., 2000) and men (von Dawans, Fischbacher, Kirschbaum, Fehr, & Heinrichs, 2012). The unifying piece between fight-or-flight and TBT perspectives is that they both identify a behavioral response to stressor. The primary goal of this study is to understand if an individual will act pro-socially towards another in response to a relationally linked stressor, or will the stressor prompt self-preserving strategies resulting in others needs becoming secondary.

The first theoretical perspective that has been offered to explain how and why individuals might engage in pro-social behaviors, even when experiencing distress, is the belongingness hypothesis of Baumeister and Leary (1995). To clarify the need to belong framework does not suggest threat is at the root of social connections, but rather the basic human affinity to form and maintain social relationships (Gere & MacDonald, 2010). The belongingness hypothesis suggests that humans have a drive to “belong” socially. Belonging is defined as a “minimum quantity of lasting, positive, and significant interpersonal relationships” (Baumeister & Leary, 1995, p. 497). As suggested by the prior quote the desired level of belonging may vary from person to person. If an individual is lacking in
social connections and begins to feel a gap in social support, a “need to belong” trigger will occur, prompting actions towards satisfying this gap. The theory argues that these tendencies to seek and form social relationships often manifest as pro-social behaviors.

A viable alternative construction of a human’s response to a threat is tend and befriend (Taylor et al., 2000). While this was originally offered primarily as an explanation of the behavior typical of female members of mammalian species, at least one recent study has generated support for the theory in an all-male human sample as well (von Dawans et al., 2012). Social affiliation behaviors from this perspective are behaviors designed to tend to another in need or befriend another to mutually strengthen survival (Taylor, 2006). Both tending and befriending are conceptually pro-social behaviors insofar as protection is gained in the connections created and the bolstered attention to offspring and loved ones. This evolutionary mechanism may offer insight into how and when individuals may, or may not, demonstrate more pro-social behaviors.

To restate, the current aim of the study is to understand the influence of a stressor is rooted in social contexts on pro-social outcomes. Currently, a pro-social outcome is referred to as helping. It is important to note here that all forms of helping another person can be thought of as pro-social behaviors, however, not all pro-social behavior is helping. In other words, pro-social behavior is a larger umbrella term to capture positive social interactions such as helping a person. A secondary aim of this study is to understand the influence of social belonging (or lack thereof) on helping.

**Literature Review**

The experience of threats and stress is not a new phenomenon to humans. In certain cases, a threat triggers a stress response that is suggested to evoke pro-social behavior (Taylor et al., 2000; von Dawans et al., 2012). The tend and befriend argument suggests that in a scenario where a threat is present, individuals may default to adaptive survival strategies, one of which is protection of social resources/connections. The following sections will review the major components of threat appraisal, stress, and the psychophysiological response that has been associated with perceived stress. The following review will outline stress and outline what a relational stressor is. The review will then shift to clarifying the explanations and predictions that are offered by the need to belong framework (Baumeister &
Leary, 1995). The focus of the review will then shift to the primary theoretical framework known as tend and befriend (Taylor et al., 2000).

**Stress and Stress Response**

Stress is traditionally defined as “the nonspecific response of the body to any demand” (Selye, 1976, p. 53). While this definition is simple, it does require some unpacking. Stress reflects a response system that reacts to a threat that requires a reaction from the recipient. A threat is a stressor that can come in many forms such as: real or perceived physical harm, compromise to psychological well-being, and the anticipation of a physical or psychological challenge. The reaction of the body to the stress is a stress response. Lastly, it is important to note when discussing stress that not all stress is malicious. The following will systematically expand on these prior claims, concluding with an expanded definition of relational stress.

**Stressor**

A stressor can be understood through the stress concept perspective as a threat, the “stimulus or eliciting factor” of stress (Tache & Selye, 1985, p. 8). Selye (1976) originally identified a stressor as “an agent that produces stress at any time” (p. 53). More recently, literature has refined the definition to state that a stressor is a “stimulus that threatens homeostasis” (Koolhaas et al., 2011, p. 1292). This trigger can come in several forms: it can be the experience of a low sense of control, a novel or unpredictable situation, and/or a risk to one’s survival or psychological well-being (Lupien, 2009). Once this trigger is activated there is a psychological, physiological, and behavioral reaction; this is known as a stress response.

**Stress Response**

A stress response is defined as “the reaction of the organism aimed to regain homeostasis” (Koolhaas et al., 2011, p. 1292). While many physiological systems are at play during a stress response, Koolhaas and colleagues (2011) state that psychological factors also play a substantial role in this response. The body begins to operate at an accelerated level, improving overall performance of a variety of activities that may be required to address the challenges presented by the stressor (Tache & Selye, 1985). The essential goal of a stress
response is to facilitate a reaction that will relinquish the body from the experience of stress. This has been conceptualized as *coping* and can occur through traditional frameworks of “fight or flight.” Stress is eliminated when the stressor is no longer present (Tache & Selye, 1985).

**Acute vs. Chronic Stress**

Acute stress is the almost instantaneous trigger that has a cognitive and/or physiological response that alerts the body to react. The human stress response to an acute stressor represents the body’s effort to mobilize the resources necessary to manage the threat more effectively. This means that the body has an increase in blood flow with accelerated heart rate and the release of a cascade of hormones (Ellis, Jackson, & Boyce, 2006). This acute reaction can occur from not just an actual threat, but also a perceived threat (Herbert et al., 1994). Such an acute response can be triggered by use of a psychological stressor such as the Stroop’s color word test (Alansari, 2004). The Stroop’s test is a task used in a laboratory environment exposes participants to a series of words of colors written in various colors. The challenge is for the participant to not read the word, but to identify what color the word is written in. Such a task can cause a psychological tension between differentiating the written word from the color the word is written in. The body will react similarly regardless of whether the stress is real or perceived, and this response is typically understood as a “fight or flight” response. If the body maintains in a heightened stress response state for an extended period of time, the stress becomes chronic. A chronic stress is understood best by the understanding of an allostatic load.

**Allostatic Load**

Although it is important to have systems that can respond to stress, such a system also needs a counter system (Cicchetti, 2011). In some cases, this process of relaxation following arousal is not possible. Allostasis is the behavioral and psychological adjustment the body makes when it cannot return to homeostasis (Koolhaas et al., 2011). Allostatic load is the long-term “cost” of stress, resulting in compromised physiological health that could be the result of three phenomena (McEwen, 1998). Simply put, an allostatic load is the physiological and psychological cost of not having a correct stress response that removes a stressor and returns the body to homeostasis. Furthermore, if the stress response system
receives repeated stimulation over an extended period of time the system will fail to operate correctly or may even fail to respond to a stressor all together (McEwen, 1998). Allostasis can be relieved through altering cognitive/psychological perception and interpretation of a stressor (McEwen, 1998). Unchecked stress over a long period of time can begin to accumulate into negative health outcomes if it is not alleviated.

**RELATIONAL STRESSOR**

Currently the focus of the study is on a stress that is rooted within an interpersonal relationship. Given the pervasive nature and necessity for social relationships it is important to understand the role of stress that arises from these relationships. Broadly speaking, a relational stressor can be a lack of belonging, loneliness, concern, or an overall threat to (or within) a desired relationship. For example, Twenge, Baumeister, DeWall, Ciarocco, and Bartels (2007) relational stressor took form of informing an individual that he/she would not have a satisfying relationship in the future. In other words, the lack of belonging in a meaningful relationship is a stressor that is inherently intertwined with social relationships (or the lack thereof). A relational stressor may also arise from interpersonal conflict, when an individual is worried, concerned, or frustrated about something in or occurring to the relational counterpart (Kiecolt-Glaser et al., 1996). Moreover, the reflection on an unhappy relationship is found to increase cortisol levels, a biomarker of stress (Berry & Worthington, 2001). When a stressor is not addressed the relationship may fall into a state of distress. Relational distress has been shown to take the form of a partner who does not understand the needs, emotions, and the overall lack of satisfaction that is found in the relationship (Taylor, Saphire-Bernstein, & Seeman, 2010). Taken together, a relational stressor may take many forms, but simply is an interpersonal interaction or event that was perceived as stressful.

**Need to Belong**

The *need to belong* perspective is less focused on a direct stress response. Instead, it is rooted in the proposition that all humans have an innate drive to have social connections (Baumeister & Leary, 1995). As may be expected by the title of this perspective, humans need to belong just as they need water, air, and food. To expand on this further the belongingness hypothesis explicitly states that it should be present even under adverse conditions (Baumeister & Leary, 1995). Additionally this hypothesis claims that a lack of
belonging should “elicit goal-oriented behavior designed to satisfy it” (Baumeister & Leary, 1995, p. 498). This is to say, an individual that does not have a sense of belonging will be motivated to achieve to goal of satiating this gap in belonging. One can survive when these life essentials are absent for a while, but at a macro level, if all individuals lack this needed element of belonging, the species survival will be in jeopardy (Floyd, Hesse, & Pauley, 2009). This perspective suggests it is not just a stressor or threat that prompts social approaching, but it is the essential requirement of an individual’s health to seek social connections (Twenge et al., 2007). If individuals’ connections are threatened or when they feel that they do not have a desired level of belonging, it is suggested that this is what prompts social approaching behavior to satiate the lack of belonging.

**SOCIAL EXCLUSION HYPOTHESIS**

At least some research has suggested that, counter to the belongingness hypothesis, a compromised sense of belonging will decrease pro-social behavior. Twenge et al. (2007) supported this claim through a laboratory study. Participants were randomly assigned to read about one of two belongingness-related scenarios. Specifically, the prompts lead participants to believe they would be alone in the future. This prompt contained phrases that suggested that, in their 20s participants might find a relationship, but by their 30s they would ultimately be alone. The other condition created a sense of future belonging by telling participants they would have a relationship in their 20s and would ultimately end up being in a happy committed relationship. This manipulation contrasted a person having a sense of belonging or not having a sense of belonging with the aim of observing the outcome of pro-social behavioral opportunities. Pro-social behavior was assessed with scenarios that involved a confederate dropping pens on the ground or a zero-sum game such as the prisoner experiment. As indicated previously, Twenge et al. (2007) found overall support that individuals whose sense of belonging was threatened exhibited lower pro-social behavior than participants whose belonging was affirmed. Their results further revealed that this effect was not related to participants’ gender and self-esteem. They suggested that “social exclusion appears to cause temporary absence of emotion, rendering the person relatively numb to both physical pain and emotion” (Twenge et al., 2007, p.63).
Twenge et al. (2007) stated “pro-social behavior is not a strategy that rejected people use to find friends” (p.64). Their results provided clear support for the social exclusion hypothesis that suggests the sense of emotional numbness felt when not belonging will diminish motivation to connect with others (DeWall & Baumeister, 2006). Furthermore, the numbness felt is also suggested to suppress the awareness of social cues by others. This sense of numbness compromises a person’s ability to form an empathetic response and build trust in others, which may be fundamental in promoting pro-social behaviors. Twenge et al. (2007) study evoked exclusion by phrasing the relational stress as a suggested future outcome. It is possible that the future tense of the induction did not evoke an acute stress response. This could be due in part to two factors: it is in the future so it is not an eminent threat, or some students may have found the prompt to not fully speak to them. Thus, one aim of the present study is to present an acute stress response to a relational stressor that has actually occurred to a person recently.

**SUMMARY OF “NEED TO BELONG”**

The need to belong highlights humans’ propensity to establish and maintain social connections (Baumeister & Leary, 1995). Much like a person being dehydrated, a thirst for social connections is also represented in a person’s physiology. The closer the body is to the desired or needed level, the healthier that body becomes. Despite this theoretic premise, empirical studies have revealed that a sense of exclusion, or not belonging, has been shown to decrease pro-social behavior whereas a sense of belonging in the future showed no significant effect on pro-social behavior (Twenge et al., 2007). To clarify, the framework of need to belong is not offered as a challenge to the competing stress response perspectives, rather this framework facilitates the underlying assumption that humans have a underlying thirst like drive to be socially connected and stress might be a catalyst to shift from motivation to action.

**Tend and Befriend**

An alternative theory to the classic fight-or-flight perspective is that one may react to a stressor is tend and befriend. This theoretical framework attributes a threat response as a motivator to seek and form social relationships. “Tend” refers to a strategy of “quieting and caring for offspring and blending into the environment” (Taylor et al., 2000, p. 412). The
term “befriend” is used to refer to “the creation of networks of associations that provide resources and protection for the female and her offspring under conditions of stress” (Taylor et al., 2000, p. 412). The root of this perspective suggests that, because of a different hormonal response to a stressor in men and women, sex does in fact promote unique behavioral responses to a threat. Research indicates that men and women do in fact activate unique stress response systems to an anticipatory stressor (Ennis, Kelly, & Lambert, 2001). Specifically, men are found to have an elevated level of vasopressin whereas women have an elevated level of oxytocin that is associated with the experience of relational distress (Taylor et al., 2010). The idea then suggests that if different hormones are responding to a stressor in men and women, the physiological response might serve different behavioral functions. This is clearly not a detailed explanation of the biological response, but is useful to point out in building the argument for TBT. In other words, TBT argues that in the face and aftermath of a stressor, women will use a survivalist strategy of social connecting and strengthening of social relationships.

**TEND/BEFRIEND**

Traditionally, a fight or flight response has been the dominant explanation for the survival strategies of humans. The tend and befriend strategy attributes a response that is focused on social strengthening, promoting concerns for the self, offspring, and for others to thwart off or defend against a threat (Taylor et al., 2000). Through strengthening social connections, the survival of those individuals is collectively promoted and enhanced through a larger presence and more social resources (Taylor, 2006). Social resources can consist of both physical resources—such as food and tools—as well as psychosocial enhancement that can help hedge the toll that stress takes on an individual. This strategy also helps explain and support the defense of offspring, which is essential in the survival of a species; with no thriving offspring, the genetic lifespan of that species is compromised. It is in the best interest of the species to defend and ensure that offspring are able to survive and mate to carry on the genetic information to subsequent generations.

**IMPLICATIONS FOR BOTH SEXES**

Taylor et al. (2000) suggest that at the root of the tend and befriend perspective is a maternal mechanism that is potentially unique to women. Women are suggested to favor an
affiliative strategy to tend and befriend in part from their investment in rearing offspring and their traditional role to protect and raise the children. Ultimately, Taylor et al. (2000) suggest that women have a unique maternal mechanism formed from their investment of time and effort into the birthing and rearing of an offspring. Without such a mechanism, offspring would have bleak ability to survive into mature age to pass on their genetic lineage. Recently research has suggested that tend and befriend is not limited to just women, however.

In a recent study, an all-male sample was observed to assess whether or not men may also enact a tend and befriend strategy in response to a stressor (von Dawans et al., 2012). Those researchers used two measures to assess participants’ physiological reactions to stressors. First, all participants were outfitted with a cardiovascular monitoring device set to obtain samples once per minute over a 35-minute period. Second, researchers collected a series of nine saliva samples to assess the degree of participants’ endocrine response to the stressors. They manipulated the participants’ stress by informing them they would have a 12-minute public speaking task, or they would be requested to complete an eight-minute mental arithmetic task. In a successful challenge of tend and befriend, men were found to increase pro-social behaviors in response to stress: in that study, pro-social behaviors consisted of trust, trustworthiness, and sharing with another individual (von Dawans et al., 2012). The finding is tremendous in that it clearly challenges the initial assumption that tend and befriend is a female survivalist strategy, extending this perspective to both sexes. Altogether, these results present conflicting evidence with the primary assumption of tend and befriend residing specifically with women in the face of stress the approach social connectedness.

**SUMMARY OF “TEND AND BEFRIEND”**

In summary, tend and befriend as a theory proposes an alternative account for adaptive mechanisms and motivations in the face of acute stress. What is unique about tend and befriend is the explicit inclusion of social connections and the benefits that are ascribed to social bonds. While this was initially proposed as a primarily female mechanism, recent research indicates that both sexes might engage in pro-social behaviors designed to increase connectedness in response to stress. Therefore it seems possible to expect an alternative stress response than just fight or flight, an individual may seek to connect and build
relationships. The current expectation is that in response to a threat and given a chance to help another, individuals may seek to act pro-socially.

**Pro-Social Behavior**

Pro-social behaviors “promote” others in a social situation. A pro-social behavior is one that consists of an exchange between individuals that has the potential of an outcome that will benefit another (Eisenberg & Fabes, 1990; Grant & Gine, 2010; Levine, Raysen, & Ganz, 2008). A pro-social behavior occurs when an individual acts to benefit another, while personal benefits are subordinate (Twenge et al., 2007). A pro-social behavior can have benefits for both the self and others (vonDawan et al., 2012), often takes the form of “helping” behaviors (Levine et al., 2008), and can be influenced by either mood (Carlson, Charlon, & Miller, 1988; Manucia, Baumann, & Cialdini, 1984) or the relationship between the individuals involved (Eisenberg & Fabes, 1990). Research concerning pro-social behavior is a vast sea of literature; the following will primarily focus on the influence of mood as it speaks best to the current aim of this study.

A collection of mood-based studies examining helping behaviors has discovered that an individual’s good or bad mood influences his or her willingness to engage in these behaviors. Traditionally, a bad mood is predictive of enhanced pro-social behavior whereas a good mood shows inconsistent effects on pro-social behavior (Manucia et al., 1984). This is suggested to represent the tendency of an individual to obtain and maintain a positive mood state so that when they are feeling negative they will perform a good deed in hopes of receiving a reward internally and possibly externally, from others. In one study, Manucia et al. (1984) found that individuals who were induced to feel sad acted more pro-socially. Furthermore, an experience of fear is shown to improve pro-social tendencies (Marsh, Kozak, & Ambady, 2007).

Taken together, the expectation is that a negative mood enhances pro-social outcomes; however, research on positive mood has found that individuals experiencing positive affect experience similar pro-social outcomes. In one study, participants who were in a positive mood from receiving a trip helped the experimenter’s friend by answering more questions than those in other conditions (Rosenhan, Salovey, & Hargis, 1981). George (1991) surveyed customer service workers and found that their sample of predominantly women
reported an increase in their helping as their positive mood increased. Aderman (1972) manipulated the positive mood of “elation” through having a male-only sample read 50 prompts. The results of Aderman’s (1972) study supported the expectation that individuals in a good mood would display an enhanced tendency to help.

Most recently, research examining pro-social behavior had participants reflect on being either a beneficiary or benefactor of a pro-social interaction (Grant & Dutton, 2012). In their experiment, participants wrote about a time that another helped them in the past week or a time they helped another. Helping was assessed by the amount of phone calls the participant made in a fund raising task. The results indicated that when an individual reflects on a time when someone else helped them, they significantly increased both the number of calls as well as their willingness to donate money. This enhanced helping behavior was not as profound when the participant reflected on a time he/she gave help in the past week (Grant & Dutton, 2012). In short, writing about a positive social interaction that consisted of receiving help from another person in a past week enhanced pro-social behavior. This may be due in part of the positive feelings a participant has after reflection on receiving help.

Taken together, these studies suggest that a positive mood should improve pro-social behavior. This causes a potential conflict with the finding that negative mood promotes pro-social behavior: Is it possible that both positive and negative mood enhance pro-social behavior? If this is the case, there is much research that is needed to understand what might exist across both moods that enhances pro-social behavior. The current aim is to reexamine helping behaviors through an experimentally induced state.

**Hypotheses and Research Questions**

Research would suggest that a need to belong is a potential drive for social affiliation, and such a drive should promote social approach (Baumeister & Leary, 1995). In contrast, a social exclusion hypothesis would suggest individuals would not seek social connection when their future belongingness needs are threatened (Twenge et al., 2007). Additionally, research suggests a role of stress induction on pro-social outcomes (Taylor, 2006), but prior literature has not focused specifically on relational stress and pro-social outcomes. If loneliness is a relational stressor that produces arousal within individuals, it can further be expected that a
tend and befriend response should be present, thus it would also suggest a pro-social response.

Throughout the prior review it has been well established that an individual’s response to a stressor is with pro-social behaviors. The following hypothesis is based on the expectation that a reaction to a psychological stress in a human will resemble a pro-social behavior. On the basis of research and theorizing in support of the tend and befriend perspective, the following hypothesis is proposed:

\[ H_1: \text{Individuals who experience a relationally stressful writing intervention exhibit greater helping than non-stressed peers.} \]

Conflicting evidence is presented with concern to sex differences in response to a stressor. Taylor et al. (2000) initially suggested that pro-social behavior is primarily women’s responses to stress. Recently, studies have found that men also engage in tending and befriending behaviors in response to a stress (von Dawans et al., 2012). Given the limited evidence supporting mens’ tendency to act pro-socially in response to a threat, the current aim is to address this conflict in the literature. Given that previous studies have determined that pro-social behaviors consistently take the form of helping behaviors (Levine et al., 2008), pro-social behaviors in the present study are conceptualized as responding favorably to requests for help. On the basis of tend and befriend theory predictions, the following hypotheses are proposed:

\[ H_2: \text{Women display a higher level of helping compared to men.} \]

\[ H_3: \text{Women display a higher level of helping compared to men in response to a relationally stressful writing intervention.} \]

The prospect of need to belong would suggest that if there is a lack of belonging, an individual will be motivated to behavior in a way to satiate that gap (Baumeister & Leary, 1995). In stark contrast to this suggestion is research of Twenge et al. (2007) suggesting that those individuals who were induced to feel lonely actually decreased their pro-social behavior. The question presently aims to probe if a stressor such as loneliness influences individuals’ willingness to engage in pro-social behavior. In addition, it remains to be seen whether or not the experience of loneliness affects the predictions of tend and befriend theory in regard to stress and social affiliation. On the one hand, it might be that loneliness (as an underlying stressor) primes individuals to seek opportunities to help others; however, it is possible that loneliness fuels a sense of detachment and an unwillingness to help (Twenge et
al., 2007). In addition to loneliness, stress has also been found to have a relationship with helping outcomes (Taylor, 2006). To address these issues, the following research questions are proposed:

**RQ1:** How do feelings of loneliness, belongingness, and stress affect individuals’ willingness to engage in pro-social behavior?

**RQ2:** Does the temporary experience of acute stress interact with feelings of loneliness to affect individuals’ pro-social behavior?
CHAPTER 2

METHODS

Recruitment occurred at a large southwestern university (Appendix A). Participants were asked to follow a link to an online form that provided a brief description of the study; if interested, they then were requested to indicate what time would be best for them to come into the laboratory and participate in an hour-long study. The first data collection of the study took place in a reserved space in an on-campus computer laboratory that had approximately 20-30 computer stations. The laboratory data collection of the study allowed for more confidence by the researcher to ensure students would in fact be spending time on the writing intervention and not browsing other sites on the web. The second data collection of the study consisted of the exact same online experimental material and procedures, but instead of participating in a computer laboratory, the participants were able to participate anywhere that had a computer and Internet access.

PARTICIPANTS

Total samples of 211 undergraduate students were recruited. The average age of the participants was 19.80 years ($SD = 2.72$). The ethnicity of the sample was predominantly European American/white (51%), followed by Latin American/Hispanic (20%), and Asian American/Asian/Pacific Islander (17%). A majority of the participants were freshman in college (55%), approximately 11% sophomores, 16% juniors, 17% seniors; the remainders were graduate students and others.

PROCEDURE

The study employed a full experimental design through a web-based survey system. During data collection one, participants arrived at the laboratory, they were seated at a computer station. The participant was first shown a consent form on his/her computer station (the consent form for the study appears in Appendix B). After the participant provided informed consent, the study began. The only difference in the second data collection was that
participants were presented the consent form on their own computer display outside a laboratory setting.

The first 15-20 minutes of the experiment had participants complete a questionnaire of approximately 100 items. At the completion of the questionnaire, the computer randomly assigned participants to receive one of two writing interventions: one focused on a relational stressor and one on a non-stressful writing task. The writing intervention had a 10-minute minimum in both data collections of the study.

Participants were randomly assigned to one of two conditions: relationally stressful writing or non-stressful writing (Appendix C). Both conditions requested that the participant write for 20 minutes. They were informed that spelling, grammar, and punctuation do not matter, and were encouraged instead to focus on recalling and writing as much as possible. In the stressful condition, participants received the following prompt:

Think about a close relationship you have. Now think of an interaction that caused you stress in that relationship. In the space provided, give a detailed description of the stressful interaction. Be sure to describe what the feeling of stress felt like.

In the non-stressful condition participants, received the following prompt based on the layout of their home:

Think about the house/apartment/dorm room in which you currently live. What does your residence look like, what is the layout, what furnishings do you have, etc.? In the space provided, give a detailed description of your current residence.

At the conclusion of the writing intervention, participants were presented an experimental helping task (description to follow). This helping measure lasted between 0-10 minutes depending on the participant’s willingness to help. Lastly participants filled out some demographic items (Appendix D). Upon completion, the participants were thanked for their time and given a sheet with contact information of the researcher and student health services in case they felt any emotional distress (Appendix E).

**MEASURES**

The following measures are organized into two primary groupings of independent variables (Appendix B). First are the primary variables, these are the measures that are utilized in the central analyses of the study. Second are the secondary variables, these are measures that account for aspects that may need to be controlled for or moderate the relationships of interest.
Primary Variables

The primary variables offer insight into three areas: sense of belonging (or lack thereof), perceived stress, and the measure of helping behavior. Participants completed the following measures in order to assess relevant attitudes and behaviors central to the proposed hypotheses and research questions.

Loneliness

The revised UCLA loneliness scale is a 20-item measure of an individual’s perceived level of social isolation (Hughes, Waite, Hawkley, & Cacioppo, 2004). Participants reported on a Likert-type scale anchored by never to often. Items consisted of prompts such as “I lack companionship”, “I do not feel alone”, and “There are people I can talk to”. These items were combined (α = .93) into a summated measure of perceived loneliness.

Belongingness

This measure consists of two factors: social connectedness and social assurance (Lee & Robbins, 1995). Social connectedness is an eight-item measure consisting of items such as: “I feel so distant from others” and “Even among my friends, there is no sense of brother/sisterhood”. Social assurance is an eight-item measure consisting of items such as: “I’m not at ease doing things together with other people” and “I stick to my friends like glue”. These scales were combined (α = .71) into a summated measure of social belonging.

Perceived Stress Scale

The Perceived Stress Scale (PSS) is a measure of the participant’s view of the stressfulness of his/her life situation (S. Cohen, Kamarck, & Merzelstein, 1988). The responses were recorded on a 5-point Likert-type scale asking participants to assess their level of feeling overloaded, out of control, and predictability. Participants’ respond to 10 items such as: “In the last month, how often have you felt nervous and ‘stress’”, “In the last month, how often have you felt that you were on top of things”, and “In the last month, how often have you felt things were going your way”. These items were combined (α = .85) into a summated measure of perceived current stress.
**Pro-Social Behavior**

The helping measure was made up of two indicators: willingness to help and time spent helping (Appendix F). Willingness to help is the terminology currently used to represent the number of times a participant agreed to help the researcher. The helping task went as follows: First, a participant received a series of up to, seven requests to “help” the researcher. When participants indicated “yes,” meaning that they were willing to help, they received a brief document with some minor spelling, grammar, and punctuation errors. Participants were requested to identify and count how many mistakes were in the paragraph; a total of 4 errors were in each paragraph. After editing one paragraph, participants submitted the page and received a prompt asking “Are you willing to help the researcher and edit an additional document?” Participants who indicated “no” at that time were done with the helping task. If participants indicated “yes,” an additional document was shown. Participants received as many as seven opportunities to help the researcher. The number of times that “yes” was participants’ response accounted for the participants’ experimental willingness to help.

In a pilot test of this measure, 166 college students participated about twice on average ($M = 1.94, SD = 2.04$). Just under 30% ($n = 49$) of the sample stated no to the first request for help, 28% ($n = 46$) stated they would help at least once. Overall, 57% ($n = 95$) of respondents to the pilot study answered no to either the first or second helping request they received. Only 19 (11.4%) of the sample replied “yes” to all six requests help. An independent $t$-test showed there was not a significant difference in a men ($n = 46, M = 1.80$) and women ($n = 117, M = 2.02$) on their willingness to help, $t(163) = -.59, p = .53$. The current study retested this measure, with the addition of one more potential request to help.

In the present study, helping behavior was additionally evaluated by the total time a participant spent on the helping task. Each page of the helping task had an embedded timer that was not visible to the participant running in the background. The time spent on each page was summated to create a total time spent helping measure.

**Secondary Variables**

The secondary variables were additional measures included in the survey to allow for a possible investigation of unexpected findings. The strategy here is to account for additional
trait factors of the sample that may need to be controlled or accounted for in future analyses. This included two trait characteristics: helping attitudes and personality. Additionally, the participants’ psychosocial well-being is included to offer insight into the prerequisite of the need to belong framework claiming that a gap in belonging will lead to detrimental health effects.

**Helping Attitude Scale**

The Helping Attitude Scale (HAS) (α = .87) is a measure of an individual’s negative and positive attitudes towards helping others (Nickell, 1996). Participants responded on a Likert-type scale to 20-items. Items consisted of prompts such as: “Helping others is usually a waste of time”, “I donate time or money to charities every month”, and “giving aid to the poor is the right thing to do”. After reverse coding the appropriate items this scale was summated into a single variable reflecting attitudes towards helping.

**Personality Trait**

Eysenck’s *Big Three* measure of personality assesses three personality dimensions: extraversion, psychoticism, and neuroticism (Eysenck, Eysenck, & Barret, 1985). The 30-items were recorded with a 5-point Likert-type scale. Extraversion (α = .78) is an individual’s preference to be outgoing with items such as: “I think of myself as a likeable person”. Psychoticism (α = .55) is a measure of a person’s aggressiveness with items such as: “I prefer to go my own way rather than act by the rules”. Neuroticism (α = .83) is a measure of a person’s emotional vulnerability with items such as: “I am easily hurt when people find fault with me or my work”.

**Perceived Well-Being**

An evaluation of the participants’ perceived well-being was assessed with a short-form version of the *General Health Questionnaire* (α = .76) (GHQ-12) (Goldberg & Williams, 2000). Participants rated how often on a 7-point Likert-type scale anchored with *very rarely* to *very often*. The measure includes items such as: “Lost much sleep over worry” and “Been able to face up to your problems”. These items were summated to make a single measure of perceived well-being.
**Validity Checks**

An item was included in a random location of the fourth page of the survey portion that told participants to mark strongly agree if they were still paying attention. This served as a check to ensure participants’ responses reflect an accurate understanding of the prompt. Additionally, this served as a check for fatigue as well.

The positive and negative affect scale (PANAS) is a measure of an in the moment emotional state (Watson, Clark, & Tellegen, 1988). This scale was presented at two times throughout the study. First, it was given to participants just prior to the instructions for the writing intervention. The second time the scale was presented was after the participant completed the helping task. This scale was used to access what emotional change the intervention caused.
CHAPTER 3

RESULTS

This study employed two discrete data collections. Both portions of the study used the same online experimental design. The only difference between the two portions is that portion one took place in a computer laboratory environment with the primary investigator present, whereas the second portion allowed participants to participate in their own personal environment. The first data collection yielded a relatively small sample size ($N = 20$) whereas the second collection consisted of many more participants ($N = 191$). The following will first review the results of the first portion of the study, followed by the second portion. All analyses were performed using SPSS v.21 (IBM).

A $t$-test was conducted comparing the in results of the “in laboratory” and the “in home” portion of the study. The $t$-test revealed that the groups significantly varied on a few variables: willingness to help, $t (188) = -4.61, p < .001$; stress, $t (209) = 2.50, p = .01$; perceived loneliness, $t (198) = 2.07, p = .04$; helping attitudes, $t (199) = -2.02, p = .045$; extraversion, $t (196) = -3.51, p = .001$; and overall mental health $t (197) = -2.20, p = .03$. The results of these analyses, along with means and standard deviations for all measures in both conditions, appear in Table 1. In terms of the present study, the difference with perhaps the most interest is that the in-laboratory group reported significantly more positive attitude about helping others. Given that the results of these tests revealed that participants in the two data collections were significantly different from one another on several influential variables, analyses of the hypotheses and research questions were separated by data collection.

DATA COLLECTION ONE: IN LABORATORY

The computer laboratory environment allowed the researcher to ensure some additional controls were present in the study. Specifically, the laboratory setting ensured that participants were not browsing unrelated websites or allowing themselves to become otherwise distracted during their participation; the computer had the study on full screen so participants did not see anything other than the study documents. The laboratory portion
Table 1. Contrast of Data Collection 1 with Collection 2 for Pro-Social Performance and Personal Traits

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data collection 1</th>
<th></th>
<th>Data collection 2</th>
<th></th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willingness to help</td>
<td>4.55</td>
<td>2.52</td>
<td>2.20</td>
<td>2.11</td>
<td>-4.61 (188)</td>
<td>&lt;.001</td>
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<tr>
<td>Time Spent Helping</td>
<td>421.01</td>
<td>169.40</td>
<td>240.32</td>
<td>399.95</td>
<td>-1.90 (186)</td>
<td>.06</td>
</tr>
<tr>
<td>Loneliness</td>
<td>1.85</td>
<td>.63</td>
<td>2.14</td>
<td>.59</td>
<td>2.07 (198)</td>
<td>.04</td>
</tr>
<tr>
<td>Belongingness</td>
<td>3.38</td>
<td>.39</td>
<td>3.38</td>
<td>.39</td>
<td>.29 (205)</td>
<td>.78</td>
</tr>
<tr>
<td>Need to Belong</td>
<td>3.12</td>
<td>.57</td>
<td>3.27</td>
<td>.52</td>
<td>1.25 (206)</td>
<td>.22</td>
</tr>
<tr>
<td>Stress</td>
<td>2.42</td>
<td>.58</td>
<td>2.73</td>
<td>.54</td>
<td>2.50 (209)</td>
<td>.01</td>
</tr>
<tr>
<td>Helping Attitude</td>
<td>4.05</td>
<td>.31</td>
<td>3.84</td>
<td>.47</td>
<td>-2.02 (199)</td>
<td>.045</td>
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<tr>
<td>Neuroticism</td>
<td>2.78</td>
<td>.83</td>
<td>2.95</td>
<td>.65</td>
<td>1.12 (202)</td>
<td>.26</td>
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<tr>
<td>Psychoticism</td>
<td>2.36</td>
<td>.34</td>
<td>2.54</td>
<td>.39</td>
<td>1.96 (201)</td>
<td>.052</td>
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<tr>
<td>Extraversion</td>
<td>3.75</td>
<td>.33</td>
<td>3.39</td>
<td>.44</td>
<td>-3.51 (196)</td>
<td>.001</td>
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<tr>
<td>Mental Health</td>
<td>3.77</td>
<td>.61</td>
<td>3.49</td>
<td>.52</td>
<td>-2.20 (197)</td>
<td>.03</td>
</tr>
<tr>
<td>Writing Time</td>
<td>736.35</td>
<td>188.46</td>
<td>773.65</td>
<td>212.29</td>
<td>.75 (188)</td>
<td>.45</td>
</tr>
</tbody>
</table>
consisted of seven men and 13 women whose, average age was 21.25 years ($SD = 5.80$). Participants were equally distributed between the two conditions with 10 in each condition.

**Validity Checks**

Time spent writing between the stressful condition ($M = 834.77$ sec., $SD = 228.28$) and control ($M = 637.94$ sec., $SD = 36.67$) were significantly different, $t(18) = -2.69, p = .02$, and indicated that participants spent more time writing about relational stressors than emotionally neutral topics. Additionally, time spent writing was not significantly correlated with total time spent help $r(20) = -.06, p = .79$, and was not significantly related to willingness to help $r(20) = -.15, p = .54$.

The PANAS revealed that participants had a significant decrease in positive affect from time one to time two ($M = -.61, SD = 1.22$), $t(18) = 2.18, p = .04$, and with respect to change in negative affect ($M = -.32, SD = .62$) analyses revealed a similarly significant decrease, $t(19) = 2.29, p = .03$. An independent t-test was conducted to test if the stressful condition significantly changed affect compared to the control condition; this revealed that the writing intervention did not significantly affect those in the stressful condition compared to the control condition for both positive affect, $t(17) = -.71, p = .49$, and negative affect $t(18) = -.38, p = .71$. Thus, the change in affect from pre- to post-intervention revealed a decrease in positive emotion as well as negative emotion regardless of condition.

**Hypothesis Testing**

Hypotheses 1 – 3 predicted that writing condition (H1), participant sex (H2), and the condition-by-sex interaction (H3) would affect participants’ willingness to engage in helping behaviors at the conclusion of the experiment. To assess these hypotheses, participants’ pro-social behavior was evaluated first by how many times participants indicated yes to a request for help, then second by how much time participants spent helping. A total of two, two-way analysis of variance (ANOVA) tests were performed on these dependent variables with participant sex and writing condition serving as fixed factors (Table 2). Hypothesis one and two predicted a main effect of condition and sex, respectively. Hypothesis three predicted an interaction effect of the two independent variables of writing condition and sex on pro-social behavior.
Table 2. Univariate Effects for Writing Condition, Sex, and Condition-by-Sex Interaction (Data Collection One)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>df</th>
<th>df error</th>
<th>$F$</th>
<th>Helping Measure</th>
<th>$p$</th>
<th>partial $\eta^2$</th>
<th>Observed power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing Condition</td>
<td>1</td>
<td>20</td>
<td>2.50</td>
<td>Time Spent Helping</td>
<td>.13</td>
<td>.14</td>
<td>.32</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>20</td>
<td>.00</td>
<td>Willingness to Help</td>
<td>.97</td>
<td>.00</td>
<td>.05</td>
</tr>
<tr>
<td>Writing Condition</td>
<td>1</td>
<td>20</td>
<td>2.15</td>
<td>Time Spent Helping</td>
<td>.16</td>
<td>.19</td>
<td>.28</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>20</td>
<td>.01</td>
<td>Willingness to Help</td>
<td>.92</td>
<td>.001</td>
<td>.05</td>
</tr>
<tr>
<td>Writing</td>
<td>1</td>
<td>20</td>
<td>1.19</td>
<td>Time Spent Helping</td>
<td>.29</td>
<td>.07</td>
<td>.18</td>
</tr>
<tr>
<td>Condition*Sex</td>
<td>1</td>
<td>20</td>
<td>4.71</td>
<td>Willingness to Help</td>
<td>.045</td>
<td>.23</td>
<td></td>
</tr>
</tbody>
</table>
HYPOTHESIS ONE (DATA COLLECTION ONE)

Hypothesis one predicted that a writing intervention focused on relational stressors would increase pro-social behavior. The independent variable for this analysis was the writing condition. The main effect of condition on time spent helping was not significant, \( F(1, 20) = 2.50, p = .13, \) partial \( \eta^2 = .14, \) observed power = .32; likewise, the test examining willingness to help was not significant \( F(1, 20) = .00, p = .97, \) partial \( \eta^2 = .00, \) observed power = .05. An investigation of the means revealed that, although more time was spent helping in the neutral condition \( (M = 456.80 \text{ sec.}, SD = 205.13) \), compared to the stressful condition \( (M = 301.01 \text{ sec.}, SD = 184.65) \), the difference was not significant. In addition, the means were in the opposite direction predicted by hypothesis one. Thus, hypothesis one was not supported.

HYPOTHESIS TWO (DATA COLLECTION ONE)

Hypothesis two predicted that women would be more pro-social than men. The independent variable for this analysis was the main effect of participant sex. Sex was not a significant predictor of time spent helping, \( F(1, 20) = 2.15, p = .16, \) partial \( \eta^2 = .19, \) observed power = .28; or willingness to help, \( F(1, 20) = .01, p = .92, \) partial \( \eta^2 = .001, \) observed power = .05. The means for time spent helping revealed that men spent less time helping \( (M = 302.56 \text{ sec.}, SD = 186.21) \) when compared to women \( (M = 420.02 \text{ sec.}, SD = 211.36) \), however, this effect was not significant. Thus, hypothesis two was not supported.

HYPOTHESIS THREE (DATA COLLECTION ONE)

Hypothesis three predicted that writing about relational stress would interact with participant sex such that, following the recall of a stressful relational event, women would agree to help more often and spend more time helping when compared to men. For this test, the interaction of sex and condition served as the factor of interest. The interaction effect involving sex and condition on time spent helping was not significant, \( F(1, 20) = 1.19, p = .29, \) partial \( \eta^2 = .07, \) observed power = .18; however, the interaction involving sex and
condition significantly predicted the number of times participants agreed to help, $F(1, 20) = 4.71, p = .045$, partial $\eta^2 = .23$.

To investigate the sex-by-condition interaction involving willingness to help, an interaction term with four categories reflecting the sex-by-condition interaction was created: male/emotionally neutral writing ($n = 4$), male/stressful writing ($n = 3$), female/emotionally neutral writing ($n = 6$), and female/stressful writing ($n = 7$). A planned contrast analysis reflecting the prediction of H3 was conducted with the following contrast coefficients: male/neutral = 0, female/neutral = 0, male/stressful = -1, female/stressful = 1. It was observed that the one-way ANOVA failed to achieve equality of group variances, most likely due to unequal cell sizes, Levene’s test = .45, $p = .72$. As a result, all additional analyses were based upon the assumption of unequal group variance. Results of the contrast did not support H3, $t(5.98) = -1.82, p = .06$; although the test approached significance, the means were in the opposite direction of H3 with men in the stressful condition ($M = 6.00, SD = 1.73$) agreeing to help more often than women in the stressful condition ($M = 3.43, SD = 2.64$).

**RESEARCH QUESTION ONE (DATA COLLECTION ONE)**

Research question one asked if loneliness, belongingness, and/or perceived stress predicted the number of times a participant agreed to help and the amount of time spent helping. A correlation revealed that loneliness, belongingness, and perceived stress were not significantly related to number of times helping or to total time spent helping (Table 3). To further investigate this relationship, additional correlations were performed that included participants’ sense of belonging, perceived stress and helping behaviors. These analyses revealed that there were no significant relationships between a sense of belonging and helping behaviors.

To further test this relationship, partial correlations were performed controlling for the effect of writing condition. This test revealed that loneliness still did not have a significant relationship with willingness to help $r(17) = -.22, p = .36$; however, loneliness was a significant predictor of total time spent helping, $r(17) = -.49, p = .03$. 
<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Loneliness</td>
<td></td>
<td></td>
<td>.26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.85</td>
<td>.63</td>
</tr>
<tr>
<td>2. Belongingness</td>
<td>(.69)**</td>
<td></td>
<td>.02</td>
<td>.43</td>
<td></td>
<td></td>
<td></td>
<td>3.36</td>
<td>.32</td>
</tr>
<tr>
<td>3. Need to Belong</td>
<td>(.24)</td>
<td>(.04)</td>
<td></td>
<td></td>
<td>.35</td>
<td>.29</td>
<td>.30</td>
<td>3.12</td>
<td>.57</td>
</tr>
<tr>
<td>4. Extraversion</td>
<td>(-.54)*</td>
<td>(.36)</td>
<td>(.02)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.78</td>
<td>.83</td>
</tr>
<tr>
<td>5. Stress</td>
<td>(.69)*</td>
<td>(-.60)*</td>
<td>(.33)</td>
<td>(-.23)</td>
<td></td>
<td></td>
<td></td>
<td>2.42</td>
<td>.58</td>
</tr>
<tr>
<td>6. Willingness to help</td>
<td>(-.22)</td>
<td>(.40)</td>
<td>(.28)</td>
<td>(.43)</td>
<td>(-.28)</td>
<td></td>
<td></td>
<td>4.55</td>
<td>2.52</td>
</tr>
<tr>
<td>7. Time helping</td>
<td>(-.49)*</td>
<td>(.45)</td>
<td>(.28)</td>
<td>(.44)</td>
<td>(-.24)</td>
<td>(.78)**</td>
<td></td>
<td>378.91</td>
<td>206.08</td>
</tr>
</tbody>
</table>

*Note.* *p < .05. **p < .001. ( ) Partial correlation controlling for writing condition.
In terms of sense of belonging, the partial correlation with willingness to help was not significant, $r (17) = .40, p = .09$; however total time spent helping was marginally correlated with belongingness, $r (17) = .45, p = .054$. In terms of perceived stress, the partial correlation was not significantly correlated with willingness to help $r (17) = -.24, p = .33$, and was not significantly related with time spent helping, $r (17) = -.24, p = .25$. Thus, research question one revealed that loneliness was significantly related to time spent helping when controlling for writing condition, but a sense of belonging was not significantly related to helping behaviors.

**Research Question Two (Data Collection One)**

Research question two examined if loneliness interacts with the effect of expressive writing to predict pro-social behavior. A multiple regression analysis was used to analyze the relationship among these variables. To perform this test, the writing condition variable was dummy coded, with the control (emotionally neutral) group coded as 0 and the experimental (stressful writing) condition coded by 1. In addition, loneliness was mean-centered to reduce the effects of multicollinearity in hierarchical regression analyses involving interaction terms (J. Cohen, Cohen, West, & Aiken, 2003). Finally, an interaction term including each predictor was created to calculate the interactive effects of loneliness and writing condition.

**Time Spent Helping**

Results demonstrated that the initial model including loneliness and writing condition was significant and accounted for approximately 28% of the variance in total time spent helping, $F (2, 19) = 4.64, p = .03$, adjusted $R^2 = .28$. The analysis revealed significant main effects of writing condition, $\beta = -.50, t = -2.50, p = .02$, and perceived loneliness, $\beta = -.47, t = -2.31, p = .03$. The full regression model containing the predictors in step one and the interaction term in step two was not significant, $F (3, 19) = 2.99, p = .06$, adjusted $R^2 = .24$. This analysis revealed that writing condition was still significant a significant predictor of time spent helping, $\beta = -.50, t = -2.44, p = .03$; however, neither perceived loneliness, $\beta = -.39, t = -1.41, p = .18$, nor the interaction term, $\beta = -.11, t = -.38, p = .71$ were significant (Figure 1). The results of this model demonstrate that, although loneliness and writing
Figure 1. Sex by condition interaction on total time spent helping.

condition both served as predictors of time spent helping individually, the interaction of these predictors did not.

WILLINGNESS TO HELP

An additional multiple regression was conducted to test the same predictors on participants’ willingness to help. The first analysis containing only loneliness and writing condition revealed that neither was a significant predictor of the number of times an individual would help, $F (2, 19) = .63, p = .55$, adjusted $R^2 = .04$. Indeed, neither writing condition, $\beta = -.98, t = -.82, p = .42$, nor loneliness, $\beta = -.91, t = -.94, p = .36$, were significant predictors. The full regression model containing the interaction term revealed no significant interaction effect, $F (3, 19) = .41, p = .75$, adjusted $R^2 = -.10$. The analysis revealed the writing condition was still not a significant predictor of willingness to help, $\beta = -.20, t = -.80, p = .43$, as was perceived loneliness, $\beta = -.89, t = -.56, p = .58$. The interaction of perceived loneliness and writing condition was also not significant, $\beta = -.06, t = -.18, p = .86$ (Figure 2). The results of these models demonstrate that loneliness and writing condition do not serve as predictors of willingness to help individually or collectively in an interaction.
Figure 2. Sex by condition interaction on willingness to help.

DATA COLLECTION TWO: OUT-OF-LABORATORY

The second portion of data collection consisted of an out-of-laboratory environment, which allowed for a convenient sampling of a larger population ($N = 191$). The out-of-laboratory portion allowed participants to participate in the study at any location with a computer and Internet access. This environment eliminated many of the controls that were present in the laboratory. Of the initial 191 participants, 21 ended their participation in the study prior to completing the writing intervention, or they did not correctly respond the check item leaving a remainder of 170 participants. The out-of-laboratory sample was predominantly female ($n = 109$) compared to male ($n = 59$), with an average age of 19.63 years ($SD = 2.05$). Participants were randomly assigned to a stressful writing intervention ($n = 84$) or a non-stressful writing intervention ($n = 86$).

Validity Checks

Across both conditions ($N = 170$), participants spent an average of 12.89 minutes writing ($M = 773.65$ sec., $SD = 212.29$; range: 600.64 to 1204.28). Time spent writing between the stressful condition ($M = 834.77$ sec., $SD = 228.28$) and control ($M = 637.94$ sec., $SD = 36.67$) were significantly different, $t (18) = -2.69$, $p = .02$, and indicated that participants spent more time writing about relational stressors than emotionally neutral
topics. Additionally, time spent writing was significantly correlated with total time spent help $r (170) = .27, p < .001$, but was not significantly related to willingness to help $r (170) = .12, p = .11$

The PANAS revealed that participants had a significant decrease in positive affect from time one to time two ($M = -.68, SD = .87$), $t (155) = 9.77, p < .001$; with respect to change in negative affect ($M = -.26, SD = .86$), analyses revealed a similarly significant decrease, $t (163) = 3.84, p < .001$. Then an independent t-test was conducted to test if the stressful condition significantly changed affect compared to the control condition. This analysis revealed that the writing intervention did not significantly affect those in the stressful condition compared to the control condition for both positive affect, $t (154) = -.14, p = .89$, and negative affect $t (162) = -.20, p = .84$. Thus, the change in participants’ affect from pre- to post-intervention revealed a decrease in positive emotion as well as negative emotion regardless of condition.

**Hypothesis Testing**

Hypotheses 1 – 3 predicted that writing condition (H1), participant sex (H2), and the condition-by-sex interaction (H3) would affect participants’ willingness to engage in helping behaviors at the conclusion of the experiment. To assess these hypotheses, participants’ pro-social behavior was evaluated first by how many times participants indicated yes to a request for help, then second by how much time participants spent helping. A total of two multivariate analysis of variance (MANOVA) tests were performed on these dependent variables with participant sex and writing condition serving as fixed factors (Table 4). The choice is based off Tabachnick and Fidell’s (2007) second claim that a MANOVA should be performed when either of the following conditions are met: (1) if two dependent variables are strongly and negatively correlated or (2) if two dependent variables are moderately correlated in either a positive or negative fashion. A simple correlation of willingness to help and time spent helping revealed that, among participants in the out-of-laboratory portion of the study, these variables were moderately positively correlated ($r = .53$).
### Table 4. Univariate Effects for Writing Condition, Sex, and Condition-by-Sex Interaction (Data Collection Two)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>df</th>
<th>df error</th>
<th>$F$</th>
<th>Helping Measure</th>
<th>$p$</th>
<th>partial $\eta^2$</th>
<th>Observed power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing Condition</td>
<td>1</td>
<td>167</td>
<td>.01</td>
<td>Time Spent Helping</td>
<td>.92</td>
<td>.00</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>167</td>
<td>.08</td>
<td>Willingness to Help</td>
<td>.78</td>
<td>.00</td>
<td>.06</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>167</td>
<td>5.34</td>
<td>Time Spent Helping</td>
<td>.02</td>
<td>.03</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>167</td>
<td>11.77</td>
<td>Willingness to Help</td>
<td>.001</td>
<td>.07</td>
<td>-</td>
</tr>
<tr>
<td>Writing</td>
<td>3</td>
<td>167</td>
<td>1.82</td>
<td>Time Spent Helping</td>
<td>.15</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Condition*Sex</td>
<td>3</td>
<td>167</td>
<td>4.13</td>
<td>Willingness to Help</td>
<td>&lt;.01</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
By comparison, the same analysis revealed that these variables were highly positively correlated in the laboratory data collection of the study ($r = .77$). Therefore by Tabachnick and Fidell’s (2007) criterion for conducting a MANOVA, the data from the out-of-laboratory portion of the study warranted multivariate analyses. Hypothesis one and two predicted a main effect of condition and sex, respectively. Hypothesis three predicted the interaction effect of the two independent variables of writing condition and sex on pro-social behavior.

**Hypothesis One (Data Collection Two)**

Hypothesis one predicted that a stressful writing intervention increases pro-social behavior. Pro-social behavior was evaluated first by how many times participants indicated yes to a request for help, then second by how much time participants spent helping. A 2 x 2 multivariate analysis of variance (MANOVA) was performed on two dependent variables: willingness to help and time spent helping. The independent variable was writing condition. The MANOVA revealed that the multivariate main effect of writing condition on helping outcomes was not significant with Wilks $\lambda = 1.00$, $F (2, 163) = .04$, $p = .96$, partial $\eta^2 = .00$, observed power = .06. At the univariate level, means revealed that participants in the control condition ($M = 2.20$, $SD = 2.14$) were willing to help approximately the same amount of time as those in the stressful condition ($M = 2.21$, $SD = 2.12$), and this difference was not significant, $F (1, 167) = .08$, $p = .78$, partial $\eta^2 = .00$, observed power = .06. At the univariate level, the total time spent helping revealed that participants in the control condition ($M = 245.10$ sec., $SD = 463.90$) spent slightly more time helping than those in the stressful condition ($M = 236.33$ sec., $SD = 328.37$), although this difference was not significant, $F (1, 167) = .01$, $p = .92$, partial $\eta^2 = .00$, observed power = .05. Thus, hypothesis one was not supported.

**Hypothesis Two (Data Collection Two)**

Hypothesis two predicted that women would be more pro-social than men. The participant sex served as the test of this hypothesis. At the multivariate level, the main effect of sex was significant, Wilks $\lambda = .93$, $F (2, 163) = 6.07$, $p < .01$, partial $\eta^2 = .07$. At the univariate level, women ($M = 2.61$, $SD = 2.23$) were significantly more willing to help than
men \((M = 1.46, SD = 1.68)\), \(F(1, 167) = 11.77, p = .001\), partial \(\eta^2 = .07\). At the univariate level, women \((M = 293.48 \text{ sec.}, SD = 472.67)\) spent significantly more time helping than men \((M = 143.51 \text{ sec.}, SD = 187.51)\), \(F(1, 167) = 5.34, p = .02\), partial \(\eta^2 = .03\). This indicates that women were more willing to help and spent more time helping when compared to men. Thus, hypothesis two was supported.

**Hypothesis Three (Data Collection Two)**

Hypothesis three predicted that writing about relational stress interacts with participants’ sex such that women would agree to help more often and spend more time helping when compared to men after recounting a stressful relational event. The relevant test from MANOVA for H3 was the sex-by-condition interaction. At the multivariate level, the use of Wilks’ criterion revealed that the interaction between sex and writing condition was not significant, Wilks \(\lambda =1.00, F(2, 163) = .19, p = .83\), partial \(\eta^2 = .00\), observed power = .08. At the univariate level, results revealed a significant sex-by-condition effect for willingness to help, \(F(3, 167) = 4.13, p < .01\). Additionally, at the univariate level, the sex-by-condition interaction was not a significant predictor of time spent helping, \(F(3, 167) = 1.82, p = .15\).

To further investigate the sex-by-condition interaction with the helping measure, a one-way ANOVA was calculated. An interaction term with four categories reflecting conditions created by the interaction of sex and condition: male/emotionally neutral writing \((n = 25)\), male/stressful writing \((n = 34)\), female/emotionally neutral writing \((n = 61)\), and female/stressful writing \((n = 48)\). A planned contrast analysis reflecting the prediction of H3 was conducted with the following contrast coefficients: male/neutral = 0, female/neutral = 0, male/stressful = -1, female/stressful = 1. Results of the contrast did support H3, \(t(164) = 2.93, p < .01\). As predicted by H3 women in the stressful condition \((M = 2.77, SD = 2.35)\) agreed to help significantly more often than men in the stressful condition \((M = 1.52, SD = 2.00)\). In sum, results from these analyses indicate that women were more willing to help but did not spend more time spent helping. Thus, hypothesis three was partially supported.
**Research Question One (Data Collection Two)**

Research question one asked if loneliness, belongingness, or perceived stress predicts the number of times a participant agrees to help and the amount of time spent helping. A correlation revealed that loneliness, belongingness, and perceived stress was not significantly related to number of times helping or to total time spent helping (Table 5). To further investigate this relationship, additional correlations were performed that included participants’ sense of belonging and helping behaviors. This revealed that there was no significant relationship between a sense of belonging and helping behaviors.

To further test this relationship, a partial correlation analysis was performed that controlled for the effects of experimental writing condition. This test revealed that loneliness still did not have a significant relationship with willingness to help, \( r (156) = -.02, p = .88 \), or total time spent helping, \( r (156) = .01, p = .95 \). With respect to a sense of belonging, there was not a significant relationship with willingness to help, \( r (156) = -.03, p = .76 \), or total time spent helping, \( r (156) = -.06, p = .49 \). Additionally, perceived stress was still not significantly correlated with willingness to help, \( r (150) = .08, p = .32 \), and time spent helping, \( r (150) = -.04, p = .63 \). Thus, research question one reveals that willingness to help and total time helping was not significantly related to perceived loneliness, a sense of belonging, or stress even controlling for writing condition.

**Research Question Two (Data Collection Two)**

Research question two examined if loneliness interacts with the effect of expressive writing to predict pro-social behavior. A multiple regression analysis was used to analyze the relationship among these variables. To perform this test, the writing condition variable was dummy coded, with the control (non-stressful) group coded as 0 and the experimental (stressful writing) condition coded as 1. In addition, loneliness was mean-centered to reduce the effects of multicollinearity in hierarchical regression analyses involving interaction terms (J. Cohen et al., 2003). Finally, an interaction term including each predictor was created to calculate the interactive effects of loneliness and writing condition.
Table 5. Summary of Intercorrelation, Means, and Standard Deviation for Scores on State, Trait, and Helping (Data Collection Two)

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Loneliness</td>
<td>-</td>
<td>-.69**</td>
<td>.19*</td>
<td>-.64**</td>
<td>.54**</td>
<td>-.02</td>
<td>.00</td>
<td>2.14</td>
<td>.59</td>
</tr>
<tr>
<td>2. Belongingness</td>
<td>(-.70)**</td>
<td>-</td>
<td>.18*</td>
<td>.47**</td>
<td>.30**</td>
<td>-.03</td>
<td>-.06</td>
<td>3.38</td>
<td>.39</td>
</tr>
<tr>
<td>3. Need to Belong</td>
<td>(.20)*</td>
<td>(.15)</td>
<td>-</td>
<td>-.09</td>
<td>.34**</td>
<td>.07</td>
<td>-.02</td>
<td>3.27</td>
<td>.52</td>
</tr>
<tr>
<td>4. Extraversion</td>
<td>(-.65)**</td>
<td>(.48)**</td>
<td>(-.09)</td>
<td>-</td>
<td>-.35**</td>
<td>.05</td>
<td>-.00</td>
<td>3.39</td>
<td>.44</td>
</tr>
<tr>
<td>5. Stress</td>
<td>(.56)**</td>
<td>(-.32)**</td>
<td>(.34)**</td>
<td>(-.40)**</td>
<td>-</td>
<td>.08</td>
<td>-.04</td>
<td>2.73</td>
<td>.54</td>
</tr>
<tr>
<td>6. Willingness to help</td>
<td>(-.02)</td>
<td>(-.02)</td>
<td>(.05)</td>
<td>(.05)</td>
<td>(.08)</td>
<td>-</td>
<td>.53**</td>
<td>2.20</td>
<td>2.11</td>
</tr>
<tr>
<td>7. Time helping</td>
<td>(.01)</td>
<td>(-.06)</td>
<td>(.03)</td>
<td>(-.00)</td>
<td>(.04)</td>
<td>(.53)**</td>
<td>-</td>
<td>240.32</td>
<td>399.95</td>
</tr>
</tbody>
</table>

Note. *p < .05. **p < .001. ( ) Partial correlation controlling for writing condition
**TIME SPENT HELPING**

Results demonstrated that the overall model was not significant and accounted for approximately 1% of the variance in total time spent helping, $F (2, 159) = .02, p = .98$, adjusted $R^2 = .01$. The analysis showed that neither writing condition, $\beta = -.01, t = -.17, p = .86$, nor perceived loneliness, $\beta = -.02, t = -.18, p = .85$, was a significant predictor of time spent helping. The second block regression revealed a non-significant interaction effect $F (3, 159) = .11, p = .95$, adjusted $R^2 = .02$. The analysis revealed that writing condition was still not significant ($\beta = -.02, t = -.18, p = .85$), and that perceived loneliness was still not significant ($\beta = .04, t = .39, p = .70$). The interaction of perceived loneliness and writing condition was also not significant ($\beta = -.06, t = -.56, p = .58$).

**WILLINGNESS TO HELP**

An additional multiple regression was conducted to test the same predictors on participants’ willingness to help. The first analysis revealed that writing condition and loneliness were not significant predictors of the number of times an individual would help, $F (2, 159) = .03, p = .97$, adjusted $R^2 = -.01$. The analysis revealed that neither writing condition, $\beta = .00, t = .06, p = .96$, nor loneliness, $\beta = -.02, t = -.24, p = .81$, was a not a significant predictor of willingness to help. The full model containing the interaction effect was likewise not significant, $F (3, 159) = .03, p = .99$, adjusted $R^2 = -.02$. Results from the full model revealed that neither the writing condition, $\beta = .00, t = .05, p = .96$, nor perceived loneliness, $\beta = -.01, t = -.07, p = .94$, were significant predictors of time spent helping. Likewise, the interaction of perceived loneliness and writing condition was not significant, $\beta = -.02, t = -.17, p = .86$. Overall the results of the regressions show that a model that accounts for loneliness and the writing condition are not significant predictors of helping.
CHAPTER 4

DISCUSSION

The current study sought to understand the role of a relational stressor on pro-social behavior. A relational stressor was produced with a writing intervention that had a participant reflect on a stressful interaction in a close relationship. Pro-social behavior was operationalized by accounting for the number of times a participant agreed to a request for help and the time spent helping. Hypotheses and theoretical frameworks were constructed under the umbrella of the need to belong (Baumeister & Leary, 1995). First, research suggests that, in response to a stressor, women will respond with primarily pro-social strategies, especially in comparison to men (Taylor, 2006). Additionally, research has found that a sense of future loneliness or a lack of belonging has decreased pro-social behavior in both men and women (Twenge et al., 2007). To test this, data was collected in one of two environments. The first data collection was conducted in a computer laboratory with a researcher present. The second data collection utilized the exact same design but allowed participants to participate at any location that has a computer and Internet access.

DATA COLLECTION ONE

During the laboratory portion of the study, a relatively small sample was available to analyze. Even with this small sample, some significant outcomes were revealed. First, total time spent helping was significantly predicted by the writing condition such that those in the neutral condition spent more time helping than those in the stressful condition. It is important to note that this relationship was in the opposite direction than predicted, however. Participants in the control condition spent approximately one-and-a-half times more time helping than those in the stressful writing condition. Before any conclusions are made, it is important to reiterate that the PANAS revealed that the two writing conditions did not result in significantly different emotional experiences.

It is interesting to note that the PANAS revealed that the participants reported a significant decrease in both positive and negative emotion following the completion of the
writing intervention and helping task. Therefore, it is unclear if the writing intervention itself caused the shift towards a neutral emotional state or if the combination of the writing intervention and helping task decreased emotional arousal. An instrumental perspective can provide support for the finding of a significant decrease in negative affect following negatively valenced stimuli if an individual has an opportunity to act pro-socially (Manucia et al., 1984; Marsh et al., 2007). To briefly restate, the instrumental perspective claims that a person will perform a behavior in order to change or maintain his/her current emotional state. Specifically, this perspective suggests that an individual that performs a prosocial behavior will alleviate a state of negative affect.

The second prediction was that sex differences affect individuals’ engagement in helping behaviors. The results of the current data collection failed to reveal a sex difference prediction. Additionally, hypothesis three predicted a significant sex-by-condition interaction such that women in a stressful condition will be more helpful then men in a stressful condition. In contrast to the predictions of tend and befriend theory (Taylor et al., 2000), the current findings revealed that men in the stressful condition agreed to help significantly more times than women in the non-stressful condition. Specifically, on average men in the stressful condition agreed to help on six of the potential seven requests for help, compared to women in the non-stressful condition who on average agreed to 3.4 requests for help. Further conclusions about this conflicting finding will be identified during the discussion of the second data collection of the study.

The research questions aimed to investigate the potential correlations of a sense of loneliness, belongingness and perceived stress with the performance of a pro-social behavior. Within the laboratory sample the current indicators of loneliness, belongingness, and need to belong did not significantly relate to either measure of pro-social behavior. Due to the small sample size if is not surprising that a survey trait measure failed to find a significant relationship.

Loneliness did not significantly predict helping individually, but a model that also accounts for the type of intervention participants received accounted for 28% of the variance in their willingness to help. This finding is loosely aligned with first the theoretical umbrella of need to belong (Baumeister & Leary, 1995), while also serving as potential support to Twenge et al.’s (2007) study suggesting that an intervention that evoked a sense of loneliness
about his/her future diminished pro-social behavior. In contrast, the current study aimed to introduce a relational stressor that has been experienced in the individual’s life instead of a hypothetical future situation. The current study contained a reflection on real past experience compared to future hypothetical possibilities. Although this is not a direct challenge of Twenge et al. (2007), it might suggest that an actual relational stressor may produce divergent outcomes on pro-social behavior compared to a potential relational stressor occurring in the future.

An important question arises from the finding that when controlling for loneliness individuals in the stressful writing condition helped less than those in the non-stressful writing condition. The question is: why would controlling for loneliness results in individuals in a stressful writing condition helping less? Essentially, what about the absence of the influence of loneliness leads to a less helpful stressful condition? The first response I have for this is fight-or-flight. The fight-or-flight framework would support an interpretation that individuals flee or do not help a source of the stressor. Deeper speculation leads to the integration of the numbness aspect of the loneliness hypothesis. For example, an individual that reports a high level of loneliness would suggest he/she does perceive many social connections to aid in alleviation of the stressor. Furthermore, with this claim I am stating that through the controlling of loneliness, numbness was also being controlled. Controlling for numbness would help parse out the flocculation of an individual’s emotional sensibility to the relational stressor.

**Data Collection Two**

During the second data collection of the study, the experiment shifted from a laboratory setting to an out-of-laboratory setting. This shift provided for increased convenience for the participant at the cost of losing some checks and controls the laboratory provided. The out-of-laboratory data collection reduced the confidence of the researcher that the participants were not distracted by other stimuli during the writing intervention and the helping task. A little over half (57%) of the in-home data collection sample were women. Data collection two consisted of approximately ten times more participants than the in-laboratory data collection.
The second data collection revealed that there was not a significant difference in terms of helping between the two writing conditions. This data collection did reveal a difference between women and men in helping. Unlike the first data collection, a significant sex difference in helping was revealed. Specifically, women agreed to help more often, while also spending more time helping, when compared to men. Furthermore, a sex-by-condition interaction was revealed. Specifically, when both sexes were exposed to a stressor, women agreed to help approximately twice as often as men. The second portion of data collection provided the strongest and most direct support for Taylor et al.’s (2000) claim that women employ more pro-social strategies in response to a stressor compared to men. An additional conclusion is drawn from Taylor et al.’s (2010) finding of increased levels of oxytocin in women that reported relational distress. The present study found that women that recalled a relational stressor increased helping. Therefore, the expectation is that a relational stressor leads to an increase in oxytocin, which then is related to an increased level of helping in women. Important to note is that across the two data collections of this study inconsistent support is provided for a sex difference in helping behavior.

The work of Twenge et al. (2007) suggests that increased loneliness and a decreased sense of belonging predict enhanced pro-social behaviors. The current results did not support this claim. Overall, perceived loneliness and a sense of belonging did not significantly predict helping. Additionally, there was not a significant interaction effect between the writing condition and loneliness. In sum, this study failed to find any significant influence of loneliness on the larger sample of the out-of-laboratory data collection. To knowledge this is the first study to try and identify an overlapping aspects of the loneliness hypothesis and tend and befriend.

**CROSS-DATA COLLECTION ANALYSIS**

During both the laboratory and in the home data collection of the study, participants spent an average of 12 minutes writing. The two data collections were compared to test if the profile of the individual that came into the laboratory was significantly different from the participants that took the study at home. This revealed that, in general, the participants in the laboratory had a more positive attitude towards helping. The participants in the laboratory also reported significantly less loneliness and stress. Not surprisingly, participants who
selected to participate in the laboratory also tended to be significantly more extraverted than the participants that took the survey at home. Additional comparisons also revealed that laboratory participants reported better overall mental health than those from the out-of-laboratory data collection of the study. These findings should be taken into consideration when interpreting the results. Overall, the laboratory participants were more willing to help, which corresponds with their generally more positive attitude towards helping. It is clear that the personality profile of participants obtained during the pre-test indicated a significant differences between the out-of-laboratory and in-laboratory participants in various respects; therefore a possible confounding factor was revealed (Spector, 1981). The divergent characteristics of those who decided to come into the laboratory, compared to those who participated at home, appear to be potentially skewed by a selection bias (Campbell & Stanley, 1963). This means that the laboratory participants may represent a different population than the out-of-laboratory participants, meaning that findings from a laboratory setting design should be taken with a grain of salt.

**LIMITATIONS**

This study was not without its limitations. The limitations of this study encompassed three domains: recruitment, the writing condition, and the measure of helping. In the following section, each of these major limitations will be discussed in turn.

**Recruitment**

A major limitation of this study is the lack of controls enforced for the out-of-laboratory data collection of the study. Although the study design attempted to promote proper time and attention to the writing intervention through locking the “next button” until 10 minutes had passed, it is still unclear how many distractions participants encountered or the amount of attention the participants paid to the prompt. Specifically, during the out-of-laboratory data collection of the study, the researcher could not be sure what type of environment the participant was in. This gives rise to the question: how many distractions and other factors were present during participation in the out-of-laboratory data collection? For example, if a participant was in a conversation with a close friend or sitting near a close friend, it is possible that this could confound the effectiveness of a stressful writing intervention; likewise, if the participant was in the control condition writing about what
his/her house looks like while sitting in his/her house, it may become a visual identification task and not a cognitive recall task. Furthermore, it is unknown if the participant worked individually on the helping task or if they received assistance.

**Writing Condition**

With respect to the writing conditions, the current demarcation was created by noting simply whether the participant was in the stressful writing condition or the control group. This grouping is arguably overly simplistic. First, the analysis did not provide any data or tests for the emotional valence of the responses by participants. Second, the responses have not undergone any form of coding to ensure the writing reflected an appropriate response to the given prompt.

**Helping Measure**

The measure of pro-social behavior consisted of a helping measure currently. This type of measure will clearly have a few limitations. First, the helping task presented a request for help that would benefit the researcher. The outcome of a request from a stranger or friend is still unclear currently. Second, the helping task consisted of only a paper-editing task. The difficulty or “cost” of this task to each participant is still unclear, meaning that some participants might have enjoyed the editing task whereas something like an arithmetic task could have been potentially more costly for them to help. Third, it is possible participants did not perceive the task as actually helping. For example, the helping task may have actually measured a person’s level of cooperation. Cooperation is a possibility because the request for help was framed as “helping the researcher,” therefore it may account for cooperation with an authority figure such as a researcher and not a general measure of helpfulness.

**Future Research**

One of the biggest challenges this study presents is that of recruitment. This study initially sought to have all participants take part in the study in a laboratory setting, allowing the research to be confident that the writing intervention received the needed attention from participants to affect stress reactions. The laboratory recruitment was available for three weeks in the middle of a spring semester. Of the over 100 individuals that viewed the recruitment survey, only approximately 40-50 individuals indicated they would be willing to
come into the laboratory. At the close of the three-week period, a total of only 20 participants actually participated in the laboratory-based study. In the future, recruitment for the laboratory portion could be improved by implementing an automatic e-mail confirmation that is sent out twice: once when the appointment is scheduled and again the day before the scheduled laboratory time.

The apparent selection bias should be taken into consideration when recruiting and analyzing the results. I suggest that the pre-test should occur prior to the invitation to come into the laboratory. At the point of laboratory recruitment, the participant should be presented with an opportunity to indicate if they would prefer to come into the laboratory or take the experimental data collection of the study at home. The invitation to come into the laboratory to participate could act as an additional measure of an individual’s willingness to help. An alternative approach to this structuring could again give a pre-test prior to the laboratory invitation so participants could then be randomly assigned to take the survey at home or in the laboratory. Again, through this design the number of participants recruited to come to the laboratory should be contrasted to the number that actually participates, to serve as an additional indicator of willingness to help. The pre-test occurring prior to the laboratory request will give a researcher an opportunity to extrapolate if there is a state or trait characteristic that influences the likelihood of a participant arriving to the laboratory.

A variation on the writing prompt is suggested for future research. Specifically, a prompt that requests participants to reflect on a time of feeling lonely in recent history might help clarify Twenge et al. (2007) findings of loneliness decreasing pro-social behavior. Their findings are in contrast to what the framework of need to belong would suggest; currently, the argument is that their findings are a result of a future hypothetical framing and not an actual experience. Therefore a prompt that reflects an actual experience of loneliness in recent history could provide the most direct challenge or support.

An additional consideration for future research is a systematic way to account for the influence of various forms of stress. Stress could be addressed in specifically three ways. First, a measure of relational distress should be present in the pre-test. Second, insight into the stress the participant experience in day-to-day life for an extended period of time could be obtained through implementing a diary component. Finally, additional studies should include a measure of how stressful the participant found the stressful interaction they wrote
about to be; this should also be paired with a measure of the state of that relationship that was discussed in the writing response.

Finally, future research should take a more nuanced look at the responses to the writing intervention. First, the current study does not clearly reveal if the stressful condition did indeed cause an elevation of stress. This information can be achieved through a few methods. The writing responses could be coded by trained researchers to identify if the participant did in fact write about a stressful relational situation; this then can be coded to clarify exactly what types of stressful relational events individuals decided to write about. Additionally, automated computer analyses utilizing programs such as the Linguistic Inquiry and Word Count (LIWC: Pennebaker, Booth, & Francis, 2007) can be conducted to account for the number of positive, negative, and neutral affect words are used. This may be a stronger indicator of the influence of the writing intervention than the general demarcation made at the level of writing condition.
REFERENCES


APPENDIX A

IRB APPROVAL
Expeditied Approval
Reg: 45 CFR 46.110(7) – minimal risk
Submit Report of Progress by: 1/19/14

February 19, 2013

Student Researcher: Ryan Malinski
Faculty Researcher: Dr. Perry Pauley
Department: School of Communication
Contract/grant number: N/A
vIRB Number: 1204087

Re: Acute relational stress and Willingness to Help: The Influence of Stress on Pro-Social Outcomes

Dear Mr. Malinski:

The above referenced protocol was reviewed and approved as expedited in accordance with SDSU’s Assurance and federal requirements pertaining to human subjects protections within the Code of Federal Regulations (45 CFR 46). This approval applies to the conditions and procedures described in your protocol. Please notify the IRB office if your status as an SDSU-affiliate changes while conducting this research study (you are no longer an SDSU faculty member, staff member or student). This approval expires February 19, 2014.

• Please submit a Report of Progress by: 1/19/14
• The following approved consent form(s) have been uploaded to your protocol file within the vIRB system, within the Supporting Documents section:
  • Malinski_1204087_Consent_IRB_STAMPED.pdf

Graduate Students: This notification may be used as documentation to register in Thesiss 799A. Attach a hard copy of this notice to your Appointment of Thesis/Project Committee form prior to submitting the completed form to Graduate and Research Affairs – Student Services Division.

For questions related to this correspondence, please contact the IRB office ((619) 594-6622 or e-mail irb@mail.sdsu.edu). To access IRB review application materials, SDSU’s Assurance, the 45 CFR 46, the Belmont Report, and/or any other relevant policies and guidelines related to the involvement of human subjects in research, please visit the IRB web site at http://ira.sdsu.edu/research.php.

Sincerely,
APPENDIX B

CONSENT FORM AND QUESTIONNAIRE ITEMS
San Diego State University Consent to Act as a Research Subject

A Writing Intervention

You are being asked to participate in a research study. Before you give your consent to volunteer, it is important that you read the following information and ask as many questions as necessary to be sure you understand what you will be asked to do.

**Investigators:**

Primary Investigator: Ryan Maliski, B.S., School of Communication

Faculty Supervisor: Perry M Pauley, Ph.D. School of Communication

**Purpose of the Study:** To understand the effects of a writing intervention on an individual’s well-being.

**Description of the Study:** The following study will ask you to identify how well a series of prompts describe you. After you have completed this brief survey, you will be asked to take part in a 20 minute writing task. During the closing of the survey you will be asked to provide some basic information about your sex, age, and level of education.

**Risks or Discomforts:** This study involves minimal risk. A potential of emotional discomfort may arise when recalling situations in response to questions. If at any time in the study you feel uncomfortable, you may discontinue participation with no explanation, either temporarily or permanently.

**Benefits of the Study:** This study will contribute to communication research. There is the potential of your instructor offering extra credit for participation, but this is not guaranteed. However, there is a minimal immediate benefit offered for participation in the study.

**Confidentiality:** Confidentiality will be maintained to the extent allowed by law. Your name will not be collected during the questionnaire portion of this study. Your name for extra credit will be collected in a separate survey that will be linked at the end of the survey. There will be no identifiable information collected during the primary survey, the link with be presented at the end of the primary survey. Anonymity will be improved through a web-based survey system that allows for password protection and encryption of information. We recommend that you securely remove this item from your browser history and close your browser window at the conclusion of survey to prevent access by others who may use the computer.
**Incentives to Participate:** You will not receive any compensation in exchange for your participation in this research. Instructors may offer extra credit to their students for proof of participation in research.

**Costs and/or Compensation for Participation:** Your cost consists of 30-45 minutes of time to take the survey. There will be no additional cost beyond time for participation in this study.

**Voluntary Nature of Participation:** Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with San Diego State University [include San Diego State University Foundation if the study is funded and the names of other institution(s) involved in the research]. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty or loss of benefits to which you are allowed.

**Questions about the Study:** If you have any questions about the research now, please ask. If you have questions later about the research, you may contact Ryan Maliski (maliski@rohan.sdsu.edu), Shannah Crane (scrane@rohan.sdsu.edu), or Faculty Adviser Perry Pauley (e-mail: ppauley@mail.sdsu.edu, phone: 619-594-0454). If you have any questions about your rights as a participant in this study, you may contact the Division of Research Affairs San Diego State University (telephone: 619-594-6622; email: irb@mail.sdsu.edu).

**Consent to Participate:** The San Diego State University Institutional Review Board has approved this consent form, as signified by the Board. The consent form must be reviewed annually and expires on the date indicated on the stamp. Your response below indicates that you have read the information in this document. Responding "Yes" indicates that you agree to be in the study and have been told that you can change your mind and withdraw your consent to participate at any time. You may print a copy of this consent form. *You have also been given a copy of The Research Participants Bill of Rights. You have been told that by agreeing to this consent form you are not giving up any of your legal rights.*
Questionnaire Items

Note: All scales used a 5-point Likert type scale.

Directions: Indicate how often you feel the way described in each of the following statements.

**R-UCLA Loneliness Scale**

1* I feel in tune with the people around me.
2  I lack companionship.
3  There is no one I can turn to.
4  I do not feel alone.
5  I feel part of a group of friends.
6  I have a lot in common with the people around me.
7  I am no longer close to anyone.
8  My interests and ideas are not shared by those around me.
9* I am an outgoing person.
10* There are people I feel close to.
11 I feel left out.
12 My social relationships are superficial.
13 No one really knows me well.
14 I feel isolated from others.
15* I can find companionship when I want it.
16* There are people who really understand me.
17 I am unhappy being so withdrawn.
18 People are around me but not with me.
19 There are people I can talk to.
20 There are people I can turn to.

**Belongingness Scale**

1  I feel disconnected from the world around me.
2  Even around people I know, I don't feel that I really belong.
3  I feel so distant from people.
4  I have no sense of togetherness with my peers.
5  I don't feel related to anyone.
6  I catch myself losing all sense of connectedness with society.
7  Even among my friends, there is no sense of brother/sisterhood.
8  I don't feel I participate with anyone or any group.
9  I feel more comfortable when someone is constantly with me.
10 I'm more at ease doing things together with other people.
11 Working side by side with others is more comfortable than working alone.
12 My life is incomplete without a buddy beside me.
13 It's hard for me to use my skills and talents without someone beside me.
14 I stick to my friends like glue. Com
15 I join groups more for the friendship than the activity itself.
16 I wish to find someone who can be with me all the time.
Directions: Indicate how well each prompt describes you.

Need to Belong
1. If other people don't seem to accept me, I don't let it bother me.
2. I try hard not to do things that will make other people avoid or reject me.
3. I seldom worry about whether other people care about me.
4. I need to feel that there are people I can turn to in times of need.
5. I want other people to accept me.
6. I do not like being alone.
7. Being apart from my friends for long periods of time does not bother me.
8. I have a strong need to belong.
9. It bothers me a great deal when I am not included in other people's plans.
10. My feelings are easily hurt when I feel that others do not accept me.

Perceived Stress
1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4*. In the last month, how often have you felt confident about your ability to handle your personal problems?
5*. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7*. In the last month, how often have you been able to control irritations in your life?
8*. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Secondary Variables

General Health Questionnaire-(GHQ-12)
1. Been able to concentrate on whatever you are doing?
2. Lost much sleep over worry?
3. Felt that you were playing a useful part in things?
4. Felt capable of making decisions about things?
5. Felt constantly under strain?
6. Felt that you couldn't overcome your difficulties?
7. Been able to enjoy your normal day-to-day activities?
8. Been able to face up to your problems?
9. Been feeling unhappy and depressed?
10. Been losing self-confidence in yourself?
11 Been thinking of yourself as a worthless person?
12 Been feeling reasonably happy, all things considered?

BIG THREE Personality Trait
1 My moods often go up and down.
2 Sometimes I feel “just miserable” for no reason.
3 I am an irritable person.
4 I often feel “fed up.”
5 I am often troubled with feelings of guilt.
6 I would call myself a nervous person.
7 I worry if I know there are mistakes in my work.
8 I think I am a tense or “high strung” person.
9 I often feel lonely.
10 I am easily hurt when people find fault with me or my work.
11* Being in debt worries me or would worry me.
12* I think having insurance is a good idea.
13 I prefer to go my own way rather than act by the rules.
14* Good manners and cleanliness matter a lot to me.
15* I enjoy cooperating with others.
16 I enjoy taking risks just for fun.
17 I often make decisions on the spur of the moment.
18* I try not to be rude to people.
19 People spend too much time safeguarding their futures with savings and insurances.
20* It’s better to follow society’s rules than to go my own way.
21 I think of myself as a rather lively person.
22 I enjoy meeting new people.
23 I like going out a lot.
24 I think of myself as being happy-go-lucky.
25 When I am with other people, I am mostly quiet.
26 I like mixing with other people.
27 I like to have plenty of bustle and excitement around me.
28* I often feel that life is very dull.
29 I usually have a “ready answer” when people talk to me.
30 I can easily adapt to new and unusual situations.

Validity Check

PANAS
Directions: At the moment. We’d like to know how you’re feeling at the moment. Please read each item below, and then mark the appropriate number between 1 (Not at All) and 7 (Frequently).

Right now, to what extent are you feeling…
1. Interested
2. Distressed
3. Excited
4. Upset
5. Strong
6. Guilty
7. Enthusiastic
8. Stressed
9. Scared
10. Proud
11. Hostile
12. Alert
13. Irritable
14. Inspired
15. Ashamed
16. Determined
17. Nervous
18. Attentive
19. Jittery
20. Active
21. Afraid
APPENDIX C

WRITING INTERVENTION PROMPTS
Writing Intervention Prompts

Instructions: For the following 20 minutes please write as much as possible in response to the prompt you will read on the next page. There is no need to worry about grammar, punctuation, or spelling. Instead, please focus on writing as much as possible in response.

Stressful Writing Condition

Think about a close relationship you have. Now think of an interaction that caused you stress in that relationship. In the space provided, give a detailed description of the stressful interaction. Be sure to describe what the feeling of stress felt like.

The page will display a next button in 10 minutes (of the requested 20 minutes)

Please refrain from identifying your specific address.

(Spelling, grammar, and punctuation do not matter)

Non-Stressful Writing Condition

Think about the house/apartment/dorm room in which you currently live. What does your residence look like, what is the layout, what furnishings do you have, etc.? In the space provided, give a detailed description of your current residence.

The page will display a next button in 10 minutes (of the requested 20 minutes)

Please refrain from identifying your specific address.

(Spelling, grammar, and punctuation do not matter)
APPENDIX D

DEMOGRAPHICS
Demographics

1. What is your age?  

2. What is your sex?
   Male
   Female

3. What is your ethnicity
   European American/White
   African American/Black
   Asian American/Asian/Pacific Islander
   Latin American/Hispanic
   Native American
   Other (please specify): __________________

4. What is your class level?
   Freshman
   Sophomore
   Junior
   Senior
   Graduate Student
   Other (please specify): __________________
APPENDIX E

RESOURCES FOR EMOTIONAL DISCOMFORT
Resources for Emotional Discomfort

If you experience any emotional distress from your participation in the study please contact:
San Diego State University Student Health Services

Clinic Hours
Mon-Fri: 8:30 - 4:30 PM
exc. Thurs: 9:30 - 4:30 PM

Additional Services
Counseling & Psych Services
619-594-5220
APPENDIX F

HELPING REQUESTS AND TASKS
Helping Requests and Tasks

1. Are you willing to help the researcher by performing a task?

   Yes  No

Directions: Please look over this document and highlight each error (by clicking on the error) in grammar, spelling, and punctuation.

After you feel you have identified all the errors, click 'Next' at the bottom of the page.

Yoga is an exercise for the body and mind. Yoga can help develop muscle strength and get your heart rate pumping. While practicing yoga, the focus is on the breathe and making your breath work as hard as the rest of your body is. Focusing on breathing and intentional movement of the body is calming for the mind. Yoga is a wunderful tool for dealing with stress.

Please enter the number of each error you identified in the above document

_____ Number of Spelling errors

_____ Number of Grammar errors

_____ Number of Punctuation errors

_____ Number of Capitalization errors

2. Are you willing to help the researcher by performing an additional task?

   Yes  No

Directions: Please look over this document and highlight each error (by clicking on the error) in grammar, spelling, and punctuation.

After you feel you have identified all the errors, click 'Next' at the bottom of the page.
Despite my efforts to focus on other things, the young man in the blue sweater caught my attention once again. This time he was standing up with the small paper cups over his eyes, swaying his head from sidetoside. He and his band partner walked outside, leaving there belongings on the table. I turned my focus back too the performer on stage, but in my peripheral vision I noticed the man in the blue sweater starring in through the window from outside. He started tapping the glass and swayed his head from side to side once again.

Please enter the number of each error you identified in the above document

____ Number of Spelling errors
____ Number of Grammar errors
____ Number of Punctuation errors
____ Number of Capitalization errors

3. Are you willing to help the researcher by performing an additional task?

Yes         No

Directions: Please look over this document and highlight each error (by clicking on the error) in grammar, spelling, and punctuation.

After you feel you have identified all the errors, click 'Next' at the bottom of the page.

There are large windows throughout the entire recreation center. It is the goal of the facility to help promote the education of the whole person and healthy lifestyles. Buy creating a space with alot of large windows, there is an feeling of openness within the building. Sunshine consistently fills the building and fresh air circulates in in through the oversized front doors.

Please enter the number of each error you identified in the above document
The topic was based on relationships involving both genders. Therefore, it was important that our focus group had an equal balance of both mail and female participants. Also, our topic do not relate to individuals in monogamous relationships. We found it necessary, therefore, that are participants were either single now, or had spent one year single while at the university. Because of the discret and somewhat secretive behavior associated with our topic, it was necessary that all participants remained anonymous.
5. Are you willing to help the researcher by performing an additional task?

Yes

No

Directions: Please look over this document and highlight each error (by clicking on the error) in grammar, spelling, and punctuation.

After you feel you have identified all the errors, click 'Next' at the bottom of the page.

It was uncomfortably stuffy in the building and the many conversations around us created a consistent low rumbling noise that I was afraid would affect the quality of my audio recording. After getting our drinks I found us a table outside to conduct an interview at. It was much calmer outside and we were able to sit comfortably in the partially shaded spot. Although I don't really know Jane, conversation flowed effortlessly as she told me about her major and plans for after graduation. Our conversational tone made the transition into the interview very easy and it felt like two friends talking, rather than a formal interview.

Please enter the number of each error you identified in the above document

____ Number of Spelling errors

____ Number of Grammar errors

____ Number of Punctuation errors

____ Number of Capitalization errors

6. Are you willing to help the researcher by performing an additional task?

Yes

No

Directions: Please look over this document and highlight each error (by clicking on the error) in grammar, spelling, and punctuation.
After you feel you have identified all the errors, click 'Next' at the bottom of the page.

The sky is a vibrant bright blue and their is not a cloud in sight when I walk out of my apartment at 9:35 a.m. thursday morning. My body happily absorbs the warmth of the sun as I walk accross the street to the gym for my weekly dance-exercise class. As I open the door of the gym, a cool gust of air bursts through and a stuffy, musty gym smell engulfs me. I cringe as I take a deep breath and alow the musty air to fill my lungs. After swiping my gym membership card at the front reception desk, I walk down the small hallway to the left of the desk toward the group exercise studio.

Please enter the number of each error you identified in the above document

___ Number of Spelling errors

___ Number of Grammar errors

___ Number of Punctuation errors

___ Number of Capitalization errors

7. Are you willing to help the researcher by performing an additional task?

Yes No