SOCIAL SUPPORT, PSYCHOSOCIAL RESOURCES AND EATING: USING SOCIAL MEDIA TO ENCOURAGE HEALTHY EATING

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SOCIAL SUPPORT, PSYCHOSOCIAL RESOURCES AND EATING:
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Scholars have suggested that social support provides people with psychosocial resources that help them cope with aversive or challenging stimuli by reducing negative arousal and altering the way they perceive the physical world. These resources are elicited when social support contacts are physically present, or when people are primed to think about social support. This research tested the hypothesis that a minimal social support prime, specifically the communicative act of sending a text message to a friend via social media, would elicit psychosocial resources to reduce negative arousal elicited by the challenge of healthy eating and in turn help people make healthier eating decisions. In addition, this dissertation explored the question of whether a social support prime would also counteract the effect of stress on eating, helping people make healthier eating decisions. An initial empirical study was used to explore the hypotheses and research question and demonstrated that a social media prime for social support led people to eat less unhealthy food, but this was not the case when a person was stressed. A second study explored the thought processes elicited by the social media social support prime and stress manipulation from the first study to explain the pattern of eating observed in the first study. This study demonstrated that stress and the social support prime made thoughts of food more cognitively accessible.

These studies contribute to the literature on psychosocial resources and social support, computer-mediated communication, and stress and eating in several ways. First this research

demonstrates that psychosocial resources provided by social support have the power to impact behavior. Second, this work suggests that a minimal social media prime has the power to elicit the same psychosocial resources as more intense social support primes and physically present social support contacts. Third, this work marks the first study to explore the thought processes behind the psychosocial resources elicited by social support.

This research also contributes to the CMC literature by demonstrating that people adapt to their communication environment, even in the absence of communication. Finally, this research contributes to the literature on stress and eating by testing a social support prime as a mechanism for reducing the impact of stress on eating.

BIOGRAPHICAL SKETCH

Jamie Guillory was born and raised in Doylestown, Pennsylvania, a suburb of Philadelphia. She graduated from Central Bucks West High School in the top 10 percent of her class in 2003. She spent the next four years studying Psychology and Public Relations at the Pennsylvania State University. During her time at Penn State she was awarded two merit scholarships: the Lawrence J. & Ellen M. Foster Scholarship and the School of Communications Alumni Society Scholarship. She was also awarded the President's Fund for Psychophysiological Research, a grant aimed at teaching undergraduate students to use psychophysiological measurements in media effects research. In 2007, she graduated from Penn State with honors in both Media Effects and Psychology and was awarded Bachelor of Arts degrees in Psychology from the College of Liberal Arts and Public Relations from the College of Communications. She was chosen as the student Marshall to represent the Department of Public Relations at the Spring 2007 commencement of the College of Communications. Her interdisciplinary undergraduate honors thesis explored the effects of Website interactivity on perceptions of organizations. In the same year, Jamie was accepted as a Master's student in the Department of Communication at Cornell University where she began to study how people form perceptions and behave in computer-mediated communication contexts with Prof. Jeffrey Hancock. In 2009, she received a Master of Science degree in Communication for her thesis exploring the ways that features of online social networking websites impact deception in online resumes. Starting in the fall of 2012 Jamie will begin exploring health in mobile contexts and online social networks as a post-doctoral scholar in the Department of Communication at Cornell under the tutelage of Prof. Geri Gay. Soon after, in January 2013, Jamie will begin work as a post-doctoral scholar with the iScience group housed in the Department of Computer Science at Universidad de Deusto in Bilbao, Spain under the tutelage of Prof. Ulf Dietrich-Reips.

To Mom, Dad, Anne, Jason, Finn, and Oliver – you are the foundations of my social support network.

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think critically about social psychology and to develop experiments that consider social psychology from a technological perspective. You have been a kind and dedicated committee member who has always been available with time and an open mind to help me through my journey as an independent scholar.

The ideas presented in this dissertation have taken shape during many months of thinking, reading and discussions. In addition to my committee members, I'd like to thank my fellow graduate students and particularly my current and former colleagues in the Social Media Lab – Natalie Bazarova, Catalina Toma, Crystal Jiang, Erin Spottswood, Amy Gonzales, and Lindsay Reynolds– for acting as a sounding board for my ideas and providing valuable feedback. I would also like to thank my friends and colleagues in the Interaction Design Lab – Geri Gay, JP Pollak and Daniela Retelny, who have provided much needed academic advice and distraction throughout this process.

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CHAPTER 1

INTRODUCTION

Social support is essential for our physical and emotional well-being (Kamarck, Manuck, & Jennings, 1990; Kiecolt-Glaser, Garner, et al., 1984; Kiecolt-Glaser, Ricker et al., 1984; Kiecolt-Glaser et al. 1987; Nolen-Hoeksema & Ahrens, 2002). Our drive for human contact is evolutionary and geared for survival. Group living in early civilizations facilitated protection from predators, acquisition of food and shelter, and care of offspring (Ainsworth, 1989; Kameda & Tindale, 2006). While modern humans can obtain sustenance and shelter without social support, research suggests that loneliness and relationship disruptions cause detriments to mental and physical health (Kamarck et al., 1990; Kiecolt-Glaser, Garner, et al., 1984; Kiecolt-Glaser, Ricker et al., 1984; Kiecolt-Glaser et al., 1987; Nolen-Hoeksema & Ahrens, 2002).

Some scholars have suggested that social support provides people with psychosocial resources that help them cope with aversive stimuli, such as stress and pain (Brown, Sheffield, Leary, & Robinson, 2003; Kamarck et al., 1990; Master, Eisenberger, Taylor, Naliboff, Shirinyan, & Lieberman, 2009). Psychosocial resources provided by social support reduce negative arousal to aversive stimuli and alter the way that people perceive the physical world, rather than providing any kind of direct physical or instrumental support (Schnall, Harber, Stefanucci, & Proffitt, 2008). People who are simply primed to think about social support, by either deeply thinking about a social support contact or viewing a photograph of the person, experience the same benefits as having a social support contact physically co-present (Master et al., 2009; Schnall et al., 2008). Other studies have shown that social support is particularly valuable when it is nonevaluative (i.e., non-judgmental) and nondirective (i.e., providing

facilitation without specific instruction regarding how one should cope) (Harber, Schneider, Everard, & Fisher, 2005; Kamarck et al., 1990).

This research suggests that even a minimal social support prime (i.e., a reminder of social support), such as thinking of a friend, should elicit psychosocial resources that can help people cope with the negative arousal that accompanies aversive or challenging situations. This dissertation examines whether a communicative act, such as sending a text message to a friend, can prime social support and influence behavior, specifically unhealthy eating behavior.

This research makes several contributions. First, social support will be primed using a novel social media manipulation (SMS text messaging) to test whether a minimal manipulation of a social support prime will be effective in eliciting the psychosocial resources needed to derive benefits from social support. Second, where previous research has been limited to using reminders of social support, such as photographs or mental simulations, to modify various perceptions (e.g., Master et al., 2009; Schnall et al., 2008), this research will establish whether a reminder social support can influence behavior, such as resisting an unhealthy snack.

Third, the research examines how psychosocial resources operate when a person is psychologically stressed. Coping with stress uses up physical and cognitive resources that are needed in decision-making about eating (Macht, 2008). The cognitively depleting experience of stress contributes to self-control failures, which helps to explain the positive relationship between stress and eating observed in the literature (McCann, Warnick, & Knopp, 1990; Michaud, Kahn, Musse, Burlet, Nicolas, & Mejean, 1990; Ng & Jeffrey, 2003). This dissertation proposes social media as a social support prime, which is then implemented in an empirical study as a novel, interpersonal strategy for counteracting the effects of stress and improving self-control in eating unhealthy food.

This dissertation is structured as follows. Chapter 2 reviews the literature on social support and health, with a specific focus on how social support and stress affect eating behavior. This chapter then reviews the theoretical groundwork behind research on psychosocial resources. Chapter 3 then reviews the literature on social media as a specific resource for priming social support and eliciting psychosocial resources. Chapter 4 reports on an empirical study (Study 1) that explores the main questions posed in this dissertation. First, Study 1 explores whether reminding participants of social support using a novel social media prime will help them to engage in self-control in eating unhealthy food. Second, Study 1 explores whether priming social support provides an adequate intervention for counteracting the effect of stress on eating. Chapter 5 then reports on a second empirical study (Study 2) aimed at exploring the thought processes behind the effect of social support on eating behavior in Study 1. Finally, Chapter 6 provides a general discussion of the empirical findings and highlights opportunities for future research.

CHAPTER 2

THEORETICAL OVERVIEW

Researchers in communication and social psychology have long emphasized the importance of affiliation and belongingness for people's healthy mental and physical functioning (Maslow, 1968; Bowlby, 1969; Baumeister & Leary, 1995; Leary, 2010). Affiliation, or interacting with individuals or groups of people, is an essential form of social behavior (Barr-Zisowitz, 1966; Hogan, Roberts, Walsh, Craik, & Price, 2000; Saucier & Goldberg, 1996). Historically, people who affiliated with groups were more likely to survive, reproduce and have surviving offspring. Group living facilitates protection from predators, acquisition of food and shelter, and care of offspring (Ainsworth, 1989; Kameda & Tindale, 2006). These historical tendencies suggest that natural selection has played a role in fostering our motivation to affiliate. Although modern society allows for survival with a more solitary lifestyle, implying that affiliation and belongingness may have become less essential for obtaining the tangible elements of survival (e.g., food and shelter), research continues to demonstrate the positive impact of supportive relationships on a variety of physical and mental health outcomes.

It is unlikely that the simple act of affiliation, with no consideration to the specific relationships between individuals, is driving these health benefits. Instead, these studies suggest that the presence of social support, which refers to perceived and actual support from known others, often during aversive experiences (Sarason, Sarason, Shearin, & Pierce, 1987), facilitates healthy mental and physical functioning. People who experience higher levels of loneliness and relationship disruptions, for example, suffer detriments to immune system functioning and depression (Kiecolt-Glaser, Garner, et al., 1984; Kiecolt-Glaser, Ricker et al., 1984; Kiecolt-

Glaser et al., 1987; Nolen-Hoeksema & Ahrens, 2002). People who lack supportive relationships also experience higher stress levels (Cohen & Wills, 1985) with studies suggesting that social support provides psychosocial resources that help people reduce their physical reactivity to stress (Kamarck et al., 1990).

Social Support and Weight Loss

In addition to the health contexts discussed above, social support has been widely studied and implemented as a resource for weight loss (e.g., Anderson, Winnett, Wojcik, & Williams, 2010; Black, Gleser, & Kooyers, 1990; Kayman, Bruvold, & Stern, 1990; Tate, Wing, & Winnett, 2001; Wing & Jeffery, 1999). Commercially successful programs such as Weight Watchers have long used social support to help people lose weight. In research, Wing and Jeffery (1999) found that participants in experimental weight loss treatment groups were more successful at losing weight and maintaining weight loss when they completed the program with friends or family members than people who completed the program alone. Similarly, a meta-analysis exploring the efficacy of couples' weight loss programs compared to solo programs, found the couples' programs to be superior, both immediately after the program and at 2- and 3-month follow-ups (Black et al., 1990). In another study, participants completing an Internet weight loss program were more successful at losing weight over a 6-month period when they received individualized feedback from a therapist compared to people who completed an Internet education program without individualized attention and feedback (Tate et al., 2001).

Having access to and using social support resources is also beneficial for weight loss. In one study exploring weight loss maintenance and relapse (i.e., gaining weight back) in women, women who maintained weight loss were very likely to use available social support resources, while relapsers were unlikely to take advantage of social support for help with problems

(Kayman et al., 1990). Relapsers in this study also reported having fewer social support resources than people who maintained weight loss.

Social support is also useful in helping people improve physical activity levels. In a health promotion study, Anderson, Wojcik, Winett and Williams (2006) implemented a program to encourage higher levels of physical activity in faith-based communities. They found that higher levels of perceived social support from friends and family were associated with more positive perceptions of self-efficacy (i.e., personal sense of control or agency over one's actions), more positive endorsements of self-regulation statements associated with physical activity (i.e., higher likelihood to make exercise plans), and greater levels of physical activity. A more recent study demonstrated these effects with a large group (N= 661) of adult participants over a 16-month period (Anderson et al., 2010).

Findings from the above studies suggest that having social support leads to greater weight loss success over time, but no known research has identified the specific features of social support that are integral to this process. Many of these studies assess participants' perceived level of social support using self-report scales (e.g., Anderson et al., 2006, 2010; Kayman et al., 1990), but provide little information about actual social support resources.

What is it about social support that helps us to change our behaviors? Weight loss is a complex process that is influenced by personal choices about diet and exercise as well peers' choices. Take physical activity as an example, Bandura (1997) argues that social support can influence physical activity in a number of ways. People might model the physical activities of friends and family members, react to encouragement or pressure from physical activity partners, or receive useful feedback from exercise instructors that leads them to engage in a different

amount or type of physical activity. This research suggests that social support can operate in a variety of different ways to influence behavior.

Recent research assessing peer involvement in weight loss, suggests that social ties engage in a variety of helpful and harmful types of active and passive involvement that influence weight loss attempts (Maitland & Chalmers, 2011). Active forms of involvement are those in which a social tie consciously contributes to behavior change, such as suggesting a particular eating choice to a spouse on a diet. Maitland and Chambers (2011) argue, however, that *passive involvement* is perhaps the most influential factor in weight loss, and might include major changes to one's environment, peer group, or lifestyle that lead to unexpected or unintended weight loss. In cases of passive influence, peers are unaware of their influence driving weight loss. For example, recent research suggests that the body type of other consumers and their portion choice affects people's portion choice, such that people mirror portion choices of consumers who are thin, but choose smaller portions when a consumer is obese (McFerran, Dahl, Fitzsimons, & Morales, 2009).

Research exploring obesity in social networks supports Maitland and Chambers' (2011) claims about passive involvement, suggesting that simply having a social tie with a person affects weight (Christakis & Fowler, 2007). Christakis and Fowler's (2007) research using a large-scale, longitudinal data set, proposes that people are more likely to be obese (and vice versa) if the people in their immediate social network are obese. This finding is a powerful one, with 57% of people being more likely to be obese if a friend is obese and 37% being more likely to be obese if their spouse is obese. What's particularly interesting about this work is that this relationship was not related to geographic location, or previous weight status. Friends also did not simply become obese at the same time. These caveats suggest that social relationships impact

weight gain and that these processes should not be attributed to common environmental factors. In combination, their findings suggest that simply having a social tie with a person can have huge impact on weight loss (or gain).

While it is important to note that Christakis and Fowler's (2007) work has been criticized by statisticians for failing to thoroughly examine the assumptions behind statistical models used to analyze their data (Lyons, 2011), the claims made in their research run parallel to data demonstrating the importance of social support to weight loss (e.g., Anderson, et al., 2010; Black et al., 1990; Kayman et al., 1990; Tate et al., 2001; Wing & Jeffery, 1999). Taken together, these data suggest that social support contacts are an important component of weight loss.

Social Support, Psychosocial Resources and Eating

The above evidence suggests that our social relationships should affect eating behaviors, though this effect may not entail conscious effort on the part of the individual or their social support contacts. Though Bandura (1997) suggests that we model the behaviors of the people around us, the overwhelming evidence that social support has a positive impact on weight loss (e.g., Black et al., 1990; Kayman et al., 1990; Wing & Jeffery, 1999), regardless of whether social support contacts are engaging in healthy eating behaviors, suggests that it is unlikely that people merely model their peers' behaviors. Rather, it seems that social support provides people with psychosocial resources that they need to engage in healthy eating.

How do these psychosocial resources elicited by social support help people to face aversive stimuli and challenging circumstances? One explanation is that social support has the capacity to change people's physiological response to these circumstances (e.g., Kamarck et al., 1990; Schnall et al., 2008). People typically amplify their arousal to negative objects and situations (Easterbrook, 1959). In research social support has reduced arousal to negative

stimuli, such as physical duress, pain, and stress (e.g., Brown et al., 2003; Kamarck et al., 1990; Master et al., 2009; Schnall et al., 2008; Thoits, 1986), altering the way people perceive these aversive circumstances.

When people are under physical duress, they also perceive distances as further and hills as steeper (Bhalla & Proffitt, 1999; Proffitt, Stefanucci, Banton & Epstein, 2003). Alternatively, when social support is available, people perceive a slope as less steep (Schnall et al., 2008). Schnall and colleagues (2008) suggest that social support provides people with psychosocial resources that help "lighten the load" and make challenges seem less threatening. Additional studies have shown similar effects of social support on perceptions, with people perceiving physical pain as less intense (Brown et al., 2003) and babies' cries as less distressed (Harber, Jussim, Kennedy, Freyberg, & Baum, 2008) when they have access to social support. Social support has also been shown to be a correlate for reduced pain perceptions in a number of studies, with research showing that social support is related to better abilities to manage pain from childbirth, chest pain, and post-operative pain (Chalmers, Wolman, Nikoderm, Gulmezoglu, & Hofmeyer, 1995; Cogan & Spinnato, 1988; Klaus, Kennel, Robertson, & Sosa, 1986; Lidderdale & Walsh, 1998; Niven, 1985).

Experimental research also establishes a causal link between pain and social support. Brown and colleagues (2003) explored this relationship by experimentally manipulating social support, having participants complete a pain tolerance task (the cold pressor task[1]) either alone or in the presence of a friend or stranger who was providing active or passive social support (i.e., providing supportive gestures and comments versus being present but not communicating). While they found that people who had support reported less pain than those who completed the

[1] The cold pressor task is a pain tolerance task that requires participants to submerge their arm in very cold water for as long as they are able to tolerate.

task alone, they did not see differences between friends and strangers or active and passive social support. A second study reported similar results for this task, with participants who received active support reporting less pain than people who were alone (Jackson, Iezzi, Chen, Ebnet, & Eglitis, 2005).

Some of the above research suggests that a social support contact need not be physically present to access social support benefits. In these studies, priming social support, which for the purposes of this dissertation is defined as having a person engage in an activity that makes them think about a social support contact, had the same effect as a physically co-present social support contact. For example, in Schnall and colleagues' research (2008) imagining a supportive friend led people to perceive physically challenging tasks as less difficult. In their experiment, having a supportive friend present and thinking about a supportive friend led people who were carrying heavy backpacks to visually perceive a slope as less steep compared to people who were alone, or imagined a neutral or disliked other. In a second study, researchers demonstrated that a mental simulation of a supportive other can lead to lower pain perceptions (Master et al., 2009). Participants in this study reported their level of pain during thermal stimulations, which involve applying heat to the forearm at varying levels and assessing pain perceptions at each level. Participants who were able to hold their romantic partner's hand or view a photograph of their partner reported significantly less pain than people who held an object or a stranger's hand, or viewed a photograph of an object, or stranger.

Importantly, the benefits that people derive from social support in these scenarios are psychological and might include making a person feel more competent or increasing their perceptions of efficacy or their ability to engage in self-control. Research supports the idea that these resources are *psychological*, and not social, with studies showing that social support is

particularly valuable when it is nonevaluative and nondirective (Harber et al., 2005; Kamarck et al., 1990). Rather than a social support contact providing direct assistance, it affects how people evaluate a challenge (Schnall et al., 2008).

Schnall et al.'s (2008) research assessed the effect of social support on visual perceptions, rather than behavior. Will the psychosocial resources provided by social support also change people's behavior? Healthy eating is a challenging decision that should seem less difficult when social support, and the psychosocial resources that it elicits, is available. The benefit of social support for individual healthy eating decisions has yet to be explored in research. Will social support make the challenge of healthy eating less threatening, and go further to help people engage in self-control in the presence of unhealthy food? This dissertation tests how being primed with social support using a novel social media manipulation, which will be described in greater detail in Chapter 3, influences behavior when a person is presented with an unhealthy eating choice. In the next section, the impact that stress has on this relationship will be explored.

Stress and Eating

Priming social support should be a useful in discouraging unhealthy eating, but will this also be effective when a person is stressed? Coping with stress, and indeed processing any emotional stimuli, uses up physical and cognitive resources that are needed in decision-making about eating (Macht, 2008). Combined with the knowledge that physical stress affects the way people perceive the physical world, making hills seem steeper and distances seem further, (Bhalla & Proffitt, 1999; Proffitt et al., 2003), it seems that stress should make people perceive the challenge of healthy eating as more difficult.

The relationship between stress and eating is complex, making certain factors important to consider when exploring this relationship. First, it is important to understand the severity of

the source of stress. Macht (2008) suggests that emotions high in arousal, or intensity, act as appetite suppressants. As stressors become more severe people tend to eat less (Stone & Brownell, 1994). For example, in one study U.S. Marines ate less on their first day of combat compared to less stressful days (Popper, Smits, Meiselman, & Hirsch, 1989).

On the other hand, in a study exploring the impact of a less extreme stressor (a school exam) on eating, male and female high school students consumed significantly more calories on an exam day compared to a stress-free day (Michaud et al., 1990). This finding suggests that stressors lower in severity lead to overeating as opposed to the under-eating that accompanies more severe stressors (Popper et al., 1989; Stone & Brownell, 1994). Low-severity stressors are more representative of the stress people experience in daily life and should have a particularly detrimental effect on weight loss.

A second important consideration to make in understanding the effect of stress on eating is the type of food that people consume during stressful times. People with higher perceived stress levels consume more high-fat foods. In a large, cross-sectional survey with 12,110 participants, higher levels of perceived stress were positively related to having a high-fat diet (Ng & Jeffrey, 2003). Additionally, at times when people had a greater perceived workload and higher levels of perceived stress they report higher total calorie and fat intake compared to times when they have lower perceived workload and stress (McCann et al., 1990). Day-to-day stress from work and school should be especially harmful for dieters because it leads to higher consumption of food, particularly high-fat food (McCann et al., 1990; Michaud et al., 1990).

Why is it that stress is so harmful for weight loss? One possible explanation for the positive relationship between stress and eating is that stress depletes a person's cognitive and physical resources that are needed to engage in self-control in the presence of unhealthy food.

According to Baumeister (1997), emotional distress is related to self-defeating behaviors such as failure to comply with medical routines, self-handicapping, and general helplessness. People also have more difficulty engaging in self-control when they are cognitively or physically depleted from self-control exercises, such as resisting tempting food, or suppressing emotion (e.g., Baumeister, 2002; Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister, Sparks, Stillman, & Vohs, 2008; Muraven & Baumeister, 2000).

Cognitive and physical depletion have been referred to as ego-depletion, which Baumeister and Vohs (2007) define as "a state in which the self does not have all the resources it has normally" (p. 2). Ego-depletion creates a temporary state in which the individual is less willing or able to function normally. Self-control exercises use up some amount of a person's strength or energy and lead to greater difficulty in engaging in self-control or responding actively to subsequent stimuli (Baumeister et al., 1998; Muraven, Tice, & Baumeister, 1998; Vohs & Faber, 2007; Vohs & Heatherton, 2000). The cognitive resources needed to cope with stress may lead to ego-depletion, which should make the challenge of healthy eating more difficult.

The detrimental impact of stress on healthy eating makes it an important factor to target in encouraging weight loss. While making people think about social support should activate psychosocial resources that help make the challenge of healthy eating less threatening and lead people to make healthier eating decisions, will the same be true when a person is stressed?

Evidence from a variety of health contexts suggests that the presence of social support leads to health benefits for people under a variety of different types of stress. For example, social support helps protect people against stress-related illnesses, such as the common cold, heart disease and cancer (Cohen, Doyle, Turner, Alper, & Skoner, 2003; Seeman & Syme, 1987; Fawzy et al., 1993). In experimental research, participants exhibit lower cardiac stress reactions

to mental math problem solving tasks when they are with a supportive friend compared to people who are alone (Kamarck et al., 1990). The presence of participants' pets also reduces their physical reactivity to stressful tasks (Allen, Blascovich, Tomaka, & Kelsey, 1991). This similar effect with pets is due to their status as non-evaluative companions (Schnall et al., 2008).

While social support should reduce the negative arousal that stressful circumstances elicit, it is unclear whether psychosocial resources will be powerful enough to reduce to the heightened negative arousal that is caused by the combination of stress and the challenge of healthy eating, and subsequently alter the way that people eat. More simply, can social support help prevent people from overeating unhealthy food when they are stressed?

Research has established that social support benefits can be derived even when a social support contact is not physically present (e.g., Master et al., 2009; Schnall et al., 2008). Though research suggests that social support should apply in a similar way to the challenge of healthy eating by providing people with the psychosocial resources they need to make healthy eating choices, the addition of stress to this scenario presents a far more formidable amount of negative arousal that these psychosocial resources would need to reduce. Will the psychosocial resources that accompany a social support prime be powerful enough to reduce negative arousal presented by the challenge of healthy eating and the experience of stress, and subsequently help people to make healthy eating decisions? In addition to exploring the impact of a social support prime on the challenge healthy eating, this dissertation tests whether priming people to think about social support can also reduce the negative impact that stress has on eating in this scenario.

CHAPTER 3

SOCIAL MEDIA AS NOVEL SOCIAL SUPPORT PRIME

The preceding chapter provides an overview of the social support and eating literature, suggesting that social support will help people overcome the challenge of eating unhealthy food, which is especially important and difficult, even when a person is stressed. First, the preceding chapter proposes that social support provides psychosocial resources that will reduce negative arousal in response to the challenge of healthy eating and help people to making healthy eating decisions. Second, the preceding chapter proposes social support will also reduce negative arousal elicited by stress, which should also help people to make healthy eating decisions.

Much of the social support literature addressed thus far refers to face-to-face (FtF) communication contexts. Several studies have used alternatives to FtF social support to derive social support benefits, such as using mental simulations that involve photographs or deep thinking about a social support contact (e.g., Master et al., 2009; Schnall et al., 2008). Research has yet to test the lower bounds for eliciting social support benefits. Can a weaker manipulation that makes a person think of social support provide the same social support benefits? Previous work suggests that social support need not involve the physical presence of another, nor need it be evaluative or directive (Harber et al., 2005; Kamarck et al., 1990; Schnall et al., 2008). Taken together, these findings suggest that the same benefits can be derived using an even weaker reminder of social support.

The present research explores whether making people think about social support using a social media context, such as sending a SMS text message to a friend, can provide similar benefits as FtF and other more complex social support techniques used in previous research (e.g.,

Master et al., 2009; Schnall et al., 2008). Social media is widely used in daily interaction and provides new opportunities for communication that surpass the boundaries of co-present, FtF communication. While the computer-mediated nature of social media has limitations compared to FtF (e.g., absence of nonverbal cues) (e.g., Elfenbein & Ambady, 2002; Ekman, 1972, 1982, 1992; Izard, 1971; Mehrabian, 1972), this chapter explains the advantages to priming social support using social media. An experiment will then be presented in Chapter 4 that explores how a social support social media prime will provide people with the psychosocial resources they need to reduce negative arousal elicited both by the challenge of healthy eating and stress, which should help them to make healthy eating decisions. This process is explained in this chapter using the theoretical mechanisms described in Chapter 2.

Kaplan and Haenlein (2010) suggest that use of social networking websites, and the interactions that take place in these spaces, such as public and private sharing of both text, images, audio and video, are an important component of social media use. For the purposes of this research, social media contexts will refer specifically to text-based communication that occurs between an acquainted sender and receiver. Some examples of these contexts include email and instant message conversations (e.g., chat conversations via AOL instant messenger, Gchat, Facebook, etc.). While Kaplan and Heinlein's (2010) definition of social media does not specifically reference SMS text messaging as a type of social media, the frequent use of direct messages and chat within social media contexts via mobile phone use suggests that SMS messages are a proxy for text-based, interpersonal interactions that take place in social media contexts.

Many social interactions that would have typically taken place in person have transferred to social media settings. Most American adults own cellphones (82%) and send text messages

daily (72%) (Lenhart, 2010). With respect to online communication, 42% of adult Internet users use instant messaging to communicate (Shiu & Lenhart, 2004) and almost three quarters of teens (73%) and young adults (72%), and 40 percent of adults over 30 are users of social networking websites (Lenhart, Purcell, Smith, & Zickuhr, 2010). These communication contexts provide opportunities for relationship maintenance and social network extension that allow relationships to continue despite obstacles of time, distance, and other restrictions.

Social media contexts differ from FtF contexts in a number of important ways. While social media provides a new and important context for accessing social support resources, it is important to consider how the different types of information available and the unique features of these contexts affect the way that social support is perceived and thus the psychosocial resources derived from social support.

Different types of information are available in social media versus FtF. FtF communication contexts provide access to nonverbal cues such as gestures, facial expressions, and voice inflection (Schachter, 1972). These cues provide information that is important to communicating emotions and relational information. Ekman (1982) suggests that there are universal and distinctive markers of emotions in our nonverbal behaviors. Research consistently demonstrates that facial expressions for basic emotions (e.g., happiness, sadness, fear) are recognized universally and cross-culturally (Elfenbein & Ambady, 2002; Ekman, 1972, 1982, 1992; Izard, 1971). Early researchers insisted that these nonverbal cues are essential to express and understand emotion (Mehrabian, 1972).

An alternative view suggests that people can adapt their expression and assessment of emotions and relational information to the constraints of a communication channel. For example, Social Information Processing Theory argues that people employ the verbal cues present in

computer-mediated communication (CMC) to convey relational information that would normally be transmitted nonverbally in FtF contexts (Walther, 1992). In one study examining this claim, users were asked to express like or dislike towards a partner in FtF or CMC (Walther, Loh, & Granka, 2007). Affinity was expressed equally effectively in both contexts, despite the absence of nonverbal cues in CMC. Instead, verbal cues carried a larger proportion of the relational information in CMC than FtF. For example, when trying to express liking for their partner, users offered praise and self-disclosures and avoided disagreements and insults more than they did in FtF. More recent research shows that these adaptive abilities extend to emotions, with communicators effectively conveying and recognizing emotions in CMC using verbal information (Hancock, Gee, Ciaccio, & Lin, 2008).

In addition to facilitating the sharing of different types of information than FtF contexts, social media contexts have unique features that should affect perceptions of social support. First, FtF interactions occur in real-time, while interactions using social media may occur in real-time (e.g., instant messaging), or asynchronously (e.g., sending and receiving content or messages at different times, as is often the case with SMS text messages sent with mobile phones).

Second, information shared in social media contexts is editable, in that it allows users the time and opportunity to craft messages and content before sharing, which is not possible FtF (Walther, 2007). While the time available for crafting messages differs between synchronous and asynchronous communication in these spaces, even synchronous communication in social media provides some opportunity to edit messages prior to sending.

Third, the computer-mediated nature of social media allows for "the reallocation of cognitive resources from environmental scanning and nonverbal management toward message composition" (p. 2541, Walther, 2007). Here environmental scanning is defined as "activities in

FtF conversation of sensing ambient stimuli, attending to conversation partners' symbolic and physical expressions, and monitoring feedback" and nonverbal management refers to "the efforts required to express oneself through the various nonverbal code systems and to maintain appearance during FtF interaction" (p. 2541). Burgoon and Walther (1990) argue that these activities require some level of attention that can be devoted to other activities in CMC.

While Walther's (1992) Social Information Processing Theory posits that social support information may be conveyed equally well in CMC and FtF contexts, these assumptions are based on *communication* between a sender and receiver. Could a simple communicative act in social media, such as sending an SMS text message to a friend, elicit the same psychosocial resources as having a friend physically present? For example, if a woman on a diet sends a text message to a supportive friend, will this increase psychosocial resources she needs to resist eating a cookie that's offered to her, regardless of whether the friend responds? From here on, priming social support will refer specifically to sending or receiving a single SMS text message to a social support contact, which makes the sender think about the social support contact.

If we consider the importance of the factors discussed above for priming social support, message synchronicity is irrelevant as priming the social support contact is a communicative act and only requires that a person send a single message to the social support contact, rather than send and receive messages. Editability is also unimportant, as the content of the message is less important than the cognitive representation of the social support contact that is primed when a message is sent to this person. The reallocation of cognitive resources, however, is important to consider as the additional cognitive resources available in this mediated communication space may affect the nature of psychosocial resources that are primed by the social support contact.

Previous studies have demonstrated that it is not necessary for a social support contact to be physically present to elicit psychosocial resources from social support (Master et al., 2009; Schnall et al., 2009). In these studies, mental representations, such as photographs and visualizations, were sufficient to derive the same benefits as the physical presence of a social support contact. The reduced nonverbal cues available in CMC allow for reallocation of cognitive resources, allowing people to devote more attention to thinking about a social support contact when they are primed in a social media context (Burgoon & Walther, 1990; Walther, 2007). Therefore priming social support in a social media context should provide similar benefits to social support (both primed and physically co-present) from previous studies.

Beyond providing a similarly useful means of priming social support to techniques that have been used in previous research, Social Information Processing Theory suggests the possibility that a prime in these contexts could provide intensified benefits. Walther's hyperpersonal model of CMC posits that the reduced nonverbal cues available in CMC contexts can lead people to form stereotypical and intensified impressions of their communication partners based on the limited information available to them (Walther, 1996). Thus CMC users are more prone to engaging in overattribution based on limited information, without considering they are using less information than they would in a FtF context to form impressions (Lea & Spears, 1992). Though much of the research using Walther's hyperpersonal model of CMC (1996) has explored communication between unacquainted strangers, the model suggests that overattribution processes in CMC should provide exaggerated, and potentially more relevant, mental representations of social support contacts than FtF contexts. Walther (1996) argues that the lack of nonverbal cues available in CMC encourages communicators to form extreme

perceptions of partners based on the specific scenario or features of a message that may suggest even the smallest amount of certain desirable (or undesirable) qualities.

Priming a social support contact in social media should lead to increased activation of the aspects of a person that are most relevant to the immediate circumstances. This is because contextual differences (e.g., how a person is feeling, who they're with, their physical environment) can influence the way people process information by affecting how accessible related constructs are in memory (Higgins & King, 1981). When a person is in need of social support to reduce negative arousal, priming social support with social media should make the contact's supportive or helpful qualities more salient, assuming that this person has been a reliable resource for social support in the past. Other aspects of the contact, such as the way they dress or their posture, should not be activated to the same degree that these other aspects might be primed when the individual is standing nearby (e.g., Schnall et al., 2008), or when they are being visualized (e.g., Master et al., 2010; Schnall et al., 2008). Thus, it is possible that priming social support using social media could provide intensified benefits compared to social support manipulations used in previous research.

To summarize, while social support in FtF contexts provides access to nonverbal cues that are important to conveying relational information, research suggests that social support is particularly beneficial when it is nonevaluative and nondirective (Harber et al., 2005; Kamarck et al., 1990). Priming people to think about social support has similar effects as physically co-present social support (Master et al., 2009; Schnall et al., 2008), but will these effects hold using a more minimal prime for social support, namely a social media prime? CMC research suggests that these contexts allow for the reallocation of cognitive resources (Burgoon & Walther, 1990; Walther, 2007), which should provide people with additional resources to focus on the social

support contact being primed by social media. The hyperpersonal model of CMC further suggests that people in these spaces may engage in overattribution processes when social support is primed, which should leading to idealized impressions of a social support contact (Walther, 1996; 1997). This knowledge, in combination with previous research findings that social support benefits can be derived even with a mental representation of a loved one (i.e., a photograph, mental simulation), suggests that social media should serve a similar, if not more powerful, function as FtF for priming social support (Master et al., 2009; Schnall et al., 2008).

CHAPTER 4

STUDY 1: THE EFFECT OF A SOCIAL SUPPORT PRIME AND STRESS ON EATING

This study investigates the possibility that social media, specifically SMS text messaging via mobile phones, can be used to prime (i.e., make people think about) social support with the specific benefits of providing psychosocial resources that should reduce negative arousal elicited by 1) the challenge of healthy eating, and 2) stress. Thus having access to psychosocial resources from a social support prime should result in healthier eating decisions in the face of the challenge to resist unhealthy food, both when a person is stressed and when they are not.

The importance of social support for weight loss (Anderson et al., 2010; Kayman et al., 1990; Tate et al., 2011) provides some evidence that priming social support should lead people to make healthier eating decisions. However, research has not yet tested whether social support alters the way that people behave. Thus, priming social support should provide a person with the psychosocial resources that will reduce negative arousal elicited by the challenge of healthy eating and help them to make healthy eating decisions. This study uses social media to prime social support by having people send an SMS text message to a friend with their mobile phone. In control conditions people will send a text message to a computer or save a message in their phone.

H1: When a person texts a friend he/she will consume less high-fat food than a person who texts a computer, or saves a message in his/her phone.

This study also proposes that the psychosocial resources provided by social support can act as an intervention for the psychologically-depleting experience of stress. The literature has

established that social support has buffering effects for both physical and mental stress (e.g., Brown et al., 2003; Kamarck et al., 1990; Master et al., 2009). In these studies people engaged in stressful tasks, such as a mental arithmetic or pain evaluations. Will social support provide similar benefits when a person is already stressed and then must tackle a challenging task? More specifically, rather than buffering the effect of a stressful task by being present prior to and during the task, will a social support prime provided after the fact reduce negative arousal caused by stress and give a person the resources they need to make healthy eating decisions?

Stress is related to self-defeating behaviors such as failure to comply with medical routines, self-handicapping, and general helplessness (Baumeister, 1997). These behaviors are likely caused by ego-depletion that stress precipitates. People have more difficulty engaging in self-control when they are cognitively or physically depleted (e.g., Baumeister, 2002; Baumeister et al., 1998; Baumeister et al., 2008; Muraven & Baumeister, 2000). Research on stress and eating shows that the experience of stress is associated with increased consumption of food, particularly high-fat food (e.g., McCann et al., 1990; Michaud et al., 1990; Ng & Jeffrey, 2003). The following prediction replicates previous research:

H2: When a person is stressed, consumption of high-fat food will increase compared to a person who is not stressed.

While stress should increase the amount of food that people eat, will social support also be useful to counteract the effect of stress on eating? Recall that negative stimuli elicit greater levels of arousal (Easterbrook, 1959). Social support has been used to counteract this heightened arousal and make people perceive difficult tasks as less challenging (e.g., Schnall et al., 2008). Importantly, priming a social support contact via social media should provide similar benefits as having a social support contact co-present, which should lead to increased self-control in eating

when a person is stressed. While it is predicted in H1 that social support using social media will help people face the challenge of healthy eating, it is unclear whether this minimal social support prime will have the power to 1) reduce negative arousal caused both by the challenge of healthy eating and stress, and 2) impact subsequent eating behavior. Given that stress provides an additional source of negative arousal, the following research question explores whether a social media prime will impact eating behavior when a person is experiencing stress:

RQ1: Will a person who is stressed and texts a friend consume less high-fat food compared to a person who is stressed and texts a computer, or saves a message in his/her phone?

Methods

Participants and recruitment

Participants were recruited, initially screening out participants with potential eating disorders, to participate in an experiment exploring health perceptions, in which they were asked to complete a task and answer some questions; they were then given the opportunity to eat a snack. Participants were recruited through an online portal that advertises ongoing research studies (http://susan.psych.cornell.edu) and were compensated with either 1 extra course credit or $5 cash.

Participants were 212 undergraduate students enrolled in psychology, human development, and communication classes at a large university in the Northeastern United States. Twenty-five percent (n= 53) of participants were male, 70.8 percent were female (n= 150) and 4.2 percent failed to provide their gender (n= 9). The average Body Mass Index (BMI) of participants was 23.67 (SD= 4.81), which falls within the World Health Organization's standards for normal, or healthy BMI.

Procedure

Prior to coming to the lab, participants were sent a link to an online survey where they were asked to answer a series of baseline questions about their health behaviors (e.g., level of physical activity, eating habits, etc.) and demographic characteristics (e.g., gender). Participants were told that they must bring their mobile phone to their scheduled participation session. Using SMS text messaging regularly on a mobile phone was a requirement for participation.

Upon arrival at the lab, all participants completed an informed consent form and were randomly assigned to one of the six experimental treatment conditions. After completing an assigned arithmetic task used as a stress induction and control (see manipulation section below for further details), participants answered the stress manipulation check items to ensure the success of the manipulation. Then, depending on their assigned experimental treatment condition, participants were asked to use their mobile phone to: text a friend, text a computer, or save a message in their phone (manipulation described in detail below). Participants then answered questionnaire items while they ate snacks provided by the experimenter (described in measures section below). Participants then watched a funny YouTube video clip to reduce any residual negative affect from the stress manipulation (the trailer from the movie the Hangover 2). Lastly, participants were debriefed and dismissed.

Manipulations

The experiment was a 2 (stress manipulation: stress, no stress) x 3 (social support prime: text a friend, text a computer, save a message) between-subjects experiment. This experimental design resulted in six conditions: 1) a stress condition where participants sent a text message to a friend (n= 37), 2) a stress condition where participants sent a text message to a computer for a GoogleVoice account (n= 36), 3) a stress condition where participants saved a text message into

the notepad of their phone (*n*= 36), 4) a no stress condition where participants sent a text message to a friend (*n*= 33), 5) a no stress condition where participants sent a text message to a computer for a GoogleVoice account (*n*= 35), and 6) a no stress condition where participants saved a text message into the notepad of their phone (*n*= 35).

Participants were randomly assigned to engage in a mental arithmetic task that has been used in previous research as a stress induction (Kamarck et al., 1990). Participants were asked to do serial subtraction by 17s, aloud, from each of three 4-digit numbers; a new 4-digit number was introduced at the start of three sequential, 1-minute intervals. Participants were asked to complete the task as quickly as possible, keeping in mind that they would be evaluated based on speed and accuracy. Participants were provided with "model" responses delivered at a pace of about one per second at the start of the task. Participants were told that most participants complete the task with high levels of speed and accuracy. Once during the task, participants were urged to improve their speed and accuracy. The experimenter used a kitchen timer, visibly displaying the amount of time elapsed to participants. The experimenter led participants to believe that they were checking the accuracy of each response on a clipboard. The experimenter maintained a stern demeanor throughout the task. The task lasted for 3 minutes.

Participants in the control condition were asked to complete a similar, though markedly less difficult, written arithmetic task. Participants were asked to subtract by 3s from a three-digit number and write their answers onto a sheet of paper. They were instructed to take their time and told that their answers would not be evaluated for accuracy. They completed the task alone, rather than in the presence of the experimenter and did not view a timer with information about the amount of time that had elapsed. The task duration was also 3 minutes.

Participants were asked one question as a manipulation check to assess their current stress level, rated on a 5-point, likert scale ('Right now I am: 1= Feeling great to 5= Stressed out.'). Participants also completed the 10-item Perceived Stress Scale (Cronbach's $\alpha = .81$) (Cohen, Kamarck, & Mermelstein, 1983) to measure their general perceptions of stress after the manipulation (e.g., 'In the last hour how often have you felt nervous or "stressed"?, 'In the last hour, how often have you been able to control the irritations in your life?').

As mentioned above, the study had three prime conditions (in parentheses please note the shorthand label for each condition that will be used throughout the remainder of this dissertation). The conditions were as follows: 1) send a text message to a supportive friend (text a friend), 2) send a text message to a computer for a GoogleVoice account (text a computer), 3) type a message into the notepad of a mobile phone (save a message). The text of the message read, "Hi there, I'm participating in a study in the Social Media Lab" for the first and second conditions, and "I'm participating in a study in the Social Media Lab" for the third condition. The message text was designed to be as similar as possible in all conditions to avoid content-related effects.

Measures

Participants responded to a series of items assessing their eating and exercise behaviors. These measures were included to control for any potential individual differences in people's typical health behaviors that may have influenced eating behaviors in the study. Participants completed the Dutch Eating Behavior Questionnaire consisting of 33 items assessed on a 5-point likert scale. This scale was used to assess participants' level of 'restrained,' 'emotional,' and 'external' eating tendencies (Van Strien, Frijters, Bergers, & Defares, 1986). These items were

not included in analyses for the present study. A full list of items from the Dutch Eating Behavior Questionnaire is provided in the Appendix.

Participants also completed 20 items on a 4-point likert scale about their daily diet (e.g., 'How often do you eat less than 3 servings of fruit a day?', 'How often do you eat more than 8 ounces (see sizes below) of meat, chicken, turkey or fish per day?', etc.). Participants then completed four items from an established scale about their physical activities (e.g., 'In how many of the past 7 days have you engaged in at least 20 minutes of exercise or sports activities that resulted in sweat and heavy breathing?', 'Engaged in exercises that strengthen or tone muscles?') (Kann, Kinchen, & Williams, 2000). Questions about eating and exercise behaviors were included to ensure that there were not differences between conditions in the healthiness of participants' behaviors (see Appendix for full list of items).

At the beginning of the study, participants were asked to answer questions about their level of hunger, fatigue, and mood to ensure that their responses were not driven by these factors ('How hungry do you feel right now?', 'How tired do you feel right now?', 'How would you rate your mood right now?') (Ward & Mann, 2000).

In order to get a measure of how the stress and social support conditions affected eating, participants were invited to snack on two food choices based on previous research studying the effects of cognitive load on food consumption (Ward & Mann, 2000). Participants were told that snacks were provided as an extra thank you for participating in the study in an effort to mask the true purpose of the study. Participants were provided with two small, disposable bowls of the following items: M&Ms candies and Doritos. The bowls were weighed using an Adam Equipment DCT Dune Compact Portable Balance with 0.2 kg capacity that weighs food in .1 gram increments. Bowls were weighed in advance and contained sufficient amounts of food so

that participants could eat as much as they preferred without feeling that they had depleted the supply. Bowls were then weighed after participants exited the experiment room to assess the amount of snacks consumed by each participant.

While participants ate their snacks, they were asked to complete a final questionnaire. First, participants answered questions about their social support network to determine whether texting a friend primed social support constructs, compared to texting a computer, or saving a message. Participants responded to 5 original items on a 10-point likert scale. These items asked participants to consider their close social ties (e.g., 'How satisfying is your relationship with your close social ties?', 'How willing would you be to turn to your close social ties for help with a problem?', 'How often are your close social ties encouraging and supportive to you when you are unhappy?'). These items were combined in a scale with high item reliability (M= 8.63, SD = 1.24; Cronbach's α= .89). See Appendix for full list of items.

Procedure summary

Below is a brief summary of the experimental procedure. Participants completed the following, which took less than 30 minutes in total:

1) provided consent for participation.
2) filled out a pre-study survey assessing their eating and exercise behaviors and demographic characteristics.
3) completed an arithmetic task (stress/no stress manipulation)
4) filled out stress measure
5) sent (or saved) a text message (social support prime manipulation)
6) ate Doritos and M&Ms while completing final questionnaire items about their social network

7) watched a funny YouTube video clip

8) received debriefing and compensation.

Data analysis

Prior to conducting data analyses to test the predictions for this study, participants' eating and exercise behaviors and level of hunger, fatigue, and mood were compared between the experimental treatment conditions to ensure that no differences existed based on these individual differences. These factors did not differ between conditions. Therefore these variables were not included in the subsequent analyses.

Analyses of variance (ANOVAs) were used to assess the effects of the stress manipulation and social support prime on the amount of food consumed by participants. Only participants who consumed food were included in the analyses exploring the amount of food consumed (Doritos or M&Ms candies) as a dependent variable. When analyzing eating variables a number of individual differences arise that can have an effect on data. For example, if a person does not like food presented to them, they will not eat. These variables can create a non-normal distribution and thus in the analysis we drop people that don't eat any food. The number of participants who chose not to eat was approximately equal across the six conditions, suggesting that the decision to eat nothing was not driven by the stress or social support factors that were manipulated in this study. Analyses including these participants can be viewed in the Appendix. Separate analyses were conducted for each type of food. For Doritos, 142 participants were included, with an approximately equal number of participants across conditions: 1) stress, text a friend (N= 24), 2) stress, text a computer (N= 25), 3) stress, save a message (N= 19), 4) no stress, text a friend (N= 24), 5) no stress, text a computer (N= 24), and 6) no stress, save a message (N= 26). One hundred and seventy-three participants were included in the analysis for

M&Ms candies: 1) stress, text a friend (*N*= 31), 2) stress, text a computer (*N*= 29), 3) stress, save a message (*N*= 29), 4) no stress, text a friend (*N*= 26), 5) no stress, text a computer (*N*= 30), and 6) no stress, save a message (*N*= 28).

Square root transformations were used to normalize the eating data, which was highly skewed despite to exclusion of non-eaters (Field, 2009). All figures and tables in this paper include raw data for food weights while in-text means and standard errors reflect transformed data.

Results

Social support and eating

H1 predicted that a social support prime should elicit psychosocial resources that help people make healthy eating decisions (i.e., eat less high-fat food) compared to people who had not been primed with social support. To test this prediction the analysis excluded participants from the stress conditions. See Table 4.1 for raw means of all eating data by condition.

An ANOVA revealed a marginally significant main effect of the social support prime condition (text a friend, text a computer, save a message) on the amount of Doritos that participants consumed, $F(2, 71)= 2.63$, $p= .08$ (see Figure 4.1). Post-hoc comparisons using the Least Square Differences criterion revealed that, as predicted, participants who texted a friend consumed significantly less Doritos ($p < .05$) than participants who saved a message, and marginally less Doritos than participants who texted a computer ($p= .09$). A second ANOVA revealed no main effect of the social support prime on the amount of M&Ms candies consumed, $F(2, 86)= .25$, $p= .78$. H1 was partially supported as participants consumed fewer Doritos after they texted a friend compared to those who texted a computer or saved a message. This was not the case for M&Ms candies.

Table 4.1: Raw means and standard deviations for the impact of the social support prime and stress on eating Doritos and M&Ms candies (in grams).

Condition		Doritos		M&Ms	
		M	SD	M	SD
No Stress	Text Friend	12.69	8.31	17.84	17.87
	Text Computer	16.68	8.15	14.62	10.58
	Save Message	18.85	11.80	17.87	15.40
Stress	Text Friend	21.33	11.54	25.80	17.80
	Text Computer	22.69	11.02	26.70	24.38
	Save Message	18.55	11.10	19.93	17.79

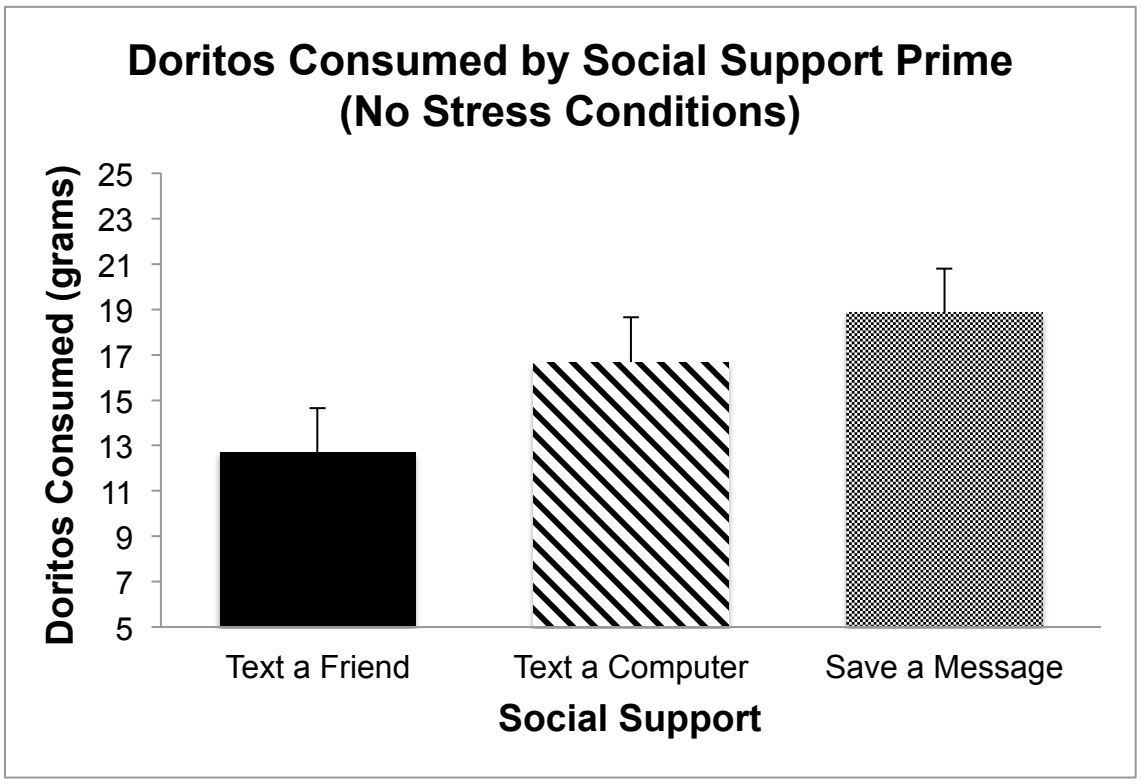

Figure 4.1: Doritos consumed by social support prime for no stress conditions (H1)

Stress and eating

Participants in the depletion condition reported feeling significantly more stressed (M= 3.35, SE= .08) compared to people in the no depletion condition (M= 2.26, SE= .09), $t(210)$= 9.46, $p < .001$. Participants in the depletion conditions also reported higher general stress perceptions (M= 2.78, SE= .06) compared to participants in the no depletion conditions (M= 2.54, SE= .07), $t(210)$= 2.73, $p < .01$. Thus the stress manipulation successfully induced stress.

H2 predicted that stress would increase eating across all social support prime conditions, such that participants who were stressed would consume more high-fat food than those who were not. Participants who were stressed consumed significantly more Doritos (M= 4.37, SE= .17) compared to people who were not stressed (M= 3.81, SE= .15), $t(140)$= 2.46, $p < .05$ (See Figure 4.2). Similarly, participants who were stressed consumed more M&Ms candies (M= 3.68, SE= .19) compared to participants who were not stressed (M= 3.81, SE= .15), $t(171)$= 2.09, $p < .05$. These findings support H2. People ate more high-fat food when they were stressed, which is consistent with findings from previous studies showing a positive relationship between everyday stress and eating (e.g., McCann et al., 1990; Michaud et al., 1990; Ng & Jeffrey, 2003).

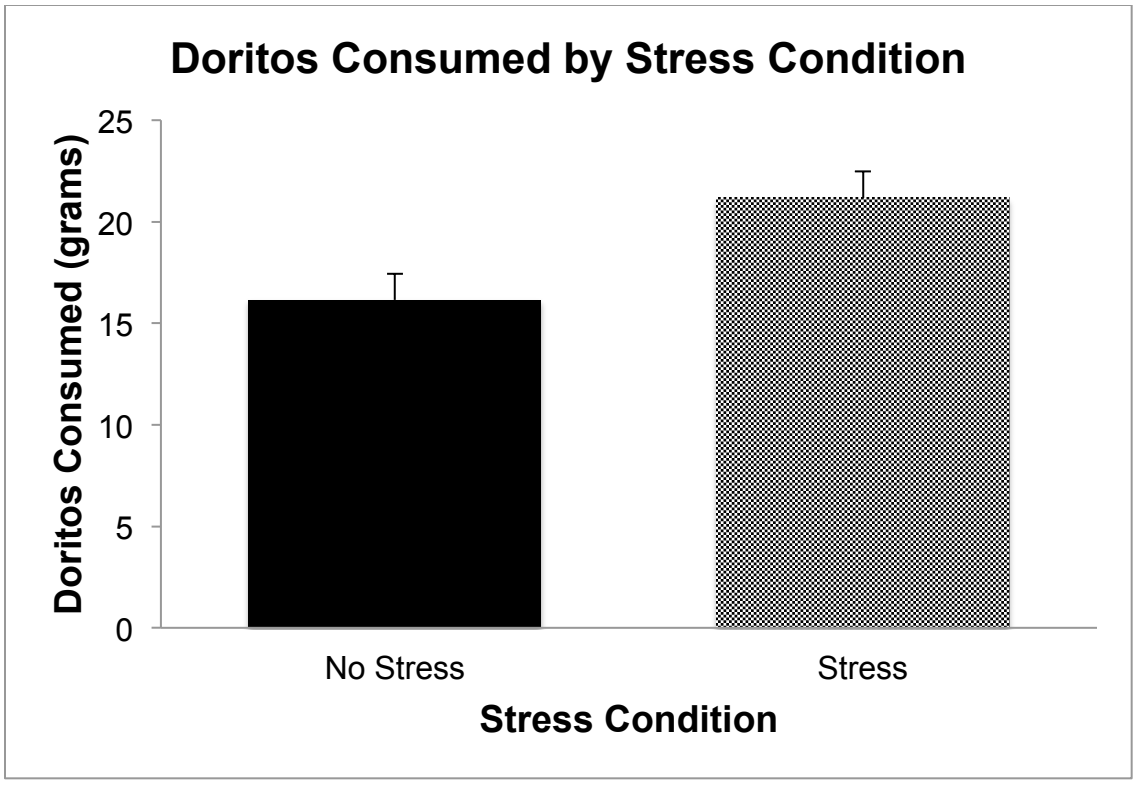

Figure 4.2: Doritos consumed by stress condition (H2).

Stress, social support and eating

RQ1 asked whether texting a friend would reduce the amount of food consumed when people were stressed, compared to people who texted a computer or saved a message when they were stressed. To explore this question the analyses included only participants in the stress conditions. Two ANOVAs were conducted with the social support prime as the predictor and the amount of food consumed (Doritos, M&Ms candies) as dependent variables.

The first ANOVA explored the effect that the text a friend manipulation had on the amount of Doritos consumed. Analysis revealed no differences between the social support prime conditions for people who were stressed, $F(2, 68)= 1.03$, $p = .36$ (see Figure 4.3). Post-hoc comparisons using the Least Square Differences criterion also revealed no differences between

the individual social support prime conditions ($p > .15$). The second ANOVA tested the effect of the text a friend manipulation on the amount of M&Ms candies consumed. The analysis revealed no differences between the social support prime conditions for people who were stressed, $F(2, 84)= 1.81$, $p = .17$, Post-hoc comparisons revealed no differences between the individual social support prime conditions ($p > .07$). Thus, RQ1 did not show differences in the amount of food that people in the social support prime conditions consumed when they were stressed.

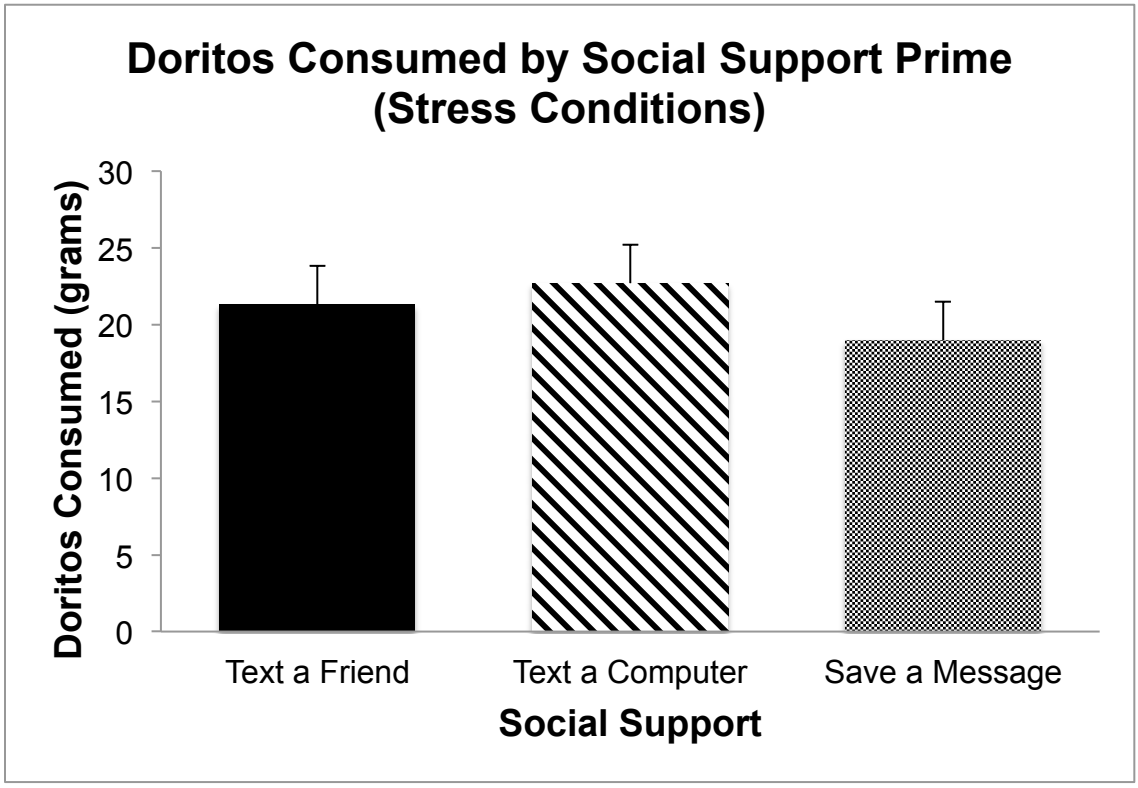

Figure 4.3: Doritos consumed by social support prime for stress conditions (RQ1).

Varying the designation of a text message, to a friend, a computer, or one's own phone, did not impact eating behavior when a person was stressed. Though this difference did not emerge, the question remains: did the social support prime of texting a friend impact eating behaviors differently for people who were stressed compared to those who were not? H1

demonstrated that people who texted a friend ate less than those who saved a message, but do people who text a friend when they're stressed eat more than people who are not stressed? Two, 2 (stress: stress, no stress) x 3 (social support: text a friend, text a computer, save a message) ANOVAs were conducted with the amount of food consumed (Doritos, M&Ms candies) as dependent variables to answer this question.

The first ANOVA explored the effect of stress and texting a friend on the amount of Doritos consumed. Analysis did not reveal an interaction between the social support prime and stress, $F(2, 136)= 2.27$, $p = .11$ (see Figure 4.4). Nonetheless, pairwise comparisons were conducted between the depletion and no depletion conditions within each social support condition to determine if people who texted a friend when they were stressed ate more than people who texted a friend when they were not stressed. These comparisons revealed that participants who were stressed and texted a friend consumed more food ($p < .01$) than those who were not stressed. Participants who texted a computer when they were stressed consumed marginally more food ($p = .08$) than those who texted a computer and were not stressed. Participants who saved a message ate similar amounts of Doritos, regardless of whether they were stressed ($p = .78$) (see Table 4.1 for raw means).

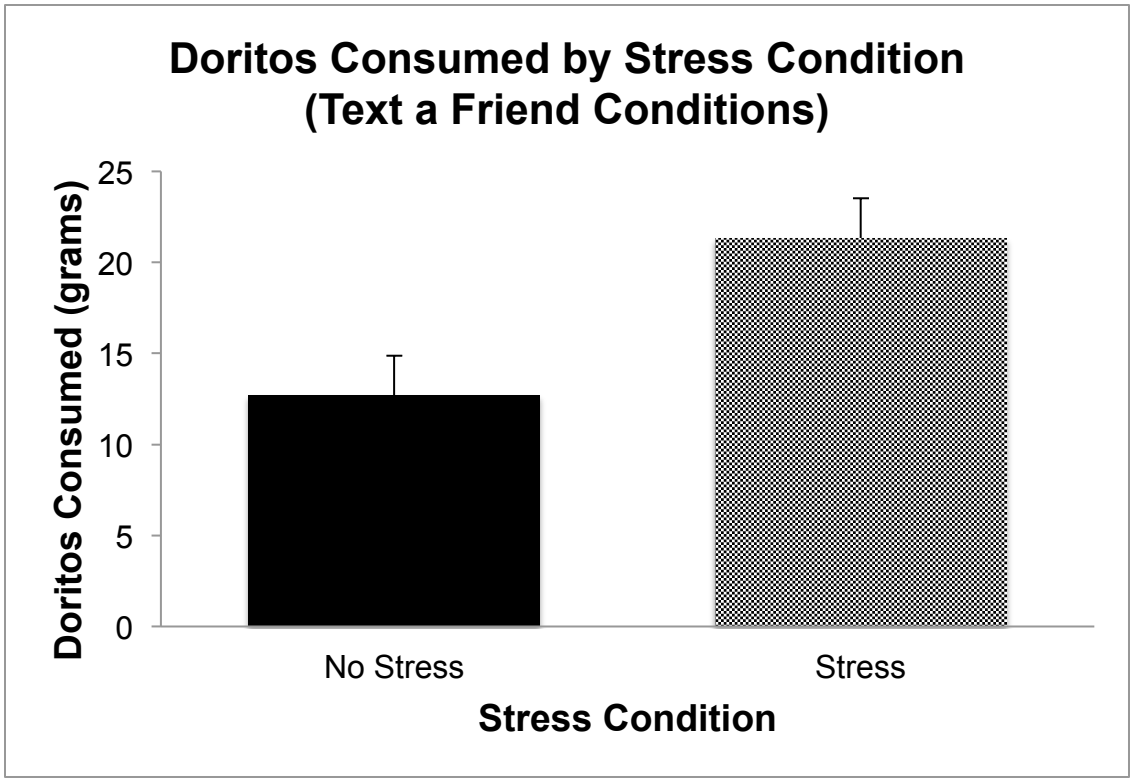

Figure 4.4: Doritos consumed by stress condition for text a friend social support prime.

The second ANOVA explored the effect of stress and the social support prime on the amount of M&Ms candies consumed. The analysis did not reveal a significant interaction between the social support prime and stress, $F(2, 167)= .65$, $p = .52$. The same series of pairwise comparisons that were conducted with the Doritos dependent variable were conducted with the M&Ms variable to compare participants who texted a friend when they were stressed to those who texted a friend when they were not. Consistent with the Doritos findings, participants who texted a friend when stressed consumed substantially more M&Ms candies ($p < .05$) than those who texted a friend and were not. Participants who texted a computer ($p = .68$), or saved a message ($p = .18$) ate similar amounts of M&Ms candies, regardless of stress.

Overall, these findings did not support the prediction that the social support prime of texting a friend would counteract the effect that stress has on eating. While specific predictions

were not made regarding how stress would change the impact of the social support prime on eating, the finding the social support prime did not decrease eating when people were stressed runs in opposition to the idea that priming social support should be beneficial regardless of whether a person is stressed.

To shed more light on this unexpected finding, several items asking participants about their perceptions of their social support network were assessed to determine 1) whether participants who texted a friend responded differently to questionnaire items about their social support network when they were stressed compared to participants who texted a friend when they were not stressed, and 2) whether participants who texted a friend responded differently to their social support network when they were stressed compared to participants who were stressed and texted a computer, or saved a message.

A series of 2 (stress manipulation: stress, no stress) x 3 (social support prime: text a friend, text a computer, save a message) ANOVAs were conducted with the social support items both as a scale and as individual dependent variables with separate analyses for people who ate Doritos and M&Ms candies. Only significant differences will be discussed. For people who ate Doritos, the analysis did not reveal an interaction between the social support prime and stress, $F(2, 136)= 1.43$, $p = .24$. A targeted pairwise comparison revealed that participants who texted a friend when they were not stressed would be significantly less willing to turn to their close ties for help with a problem ($M= 8.04$, $SE= .35$) than those who texted a friend when they were stressed ($M= 9.13$, $SE= .35$), $p < .05$. This difference did not emerge for M&Ms candies. A second targeted pairwise comparison revealed no differences between the three social support prime conditions for people who were stressed (both Doritos and M&Ms candies), suggesting that when participants were stressed, the social support prime did not impact perceptions of their

social support network. There were not significant differences between conditions for the remaining social support items.

Discussion

This study tested the impact of a text message social support prime on consumption of high-fat food, depending on whether a person was experiencing stress, or not. In this study, people who texted a friend when they were not stressed consumed fewer Doritos than people who saved a message or texted a computer. This finding is consistent with earlier studies in which having people think about social support reduced the severity of pain perceptions and made people judge a slope as less steep by reducing negative arousal elicited by these circumstances (Master et al., 2009; Schnall et al., 2008), but extends these earlier findings in two important ways. First, this study demonstrates that the psychosocial resources provided by social support can be elicited using an even more minimal prime in the social media context of text messaging with a mobile phone. Second, this study shows that these psychosocial resources affect the way that people behave, which to our knowledge has not been demonstrated in the literature.

Although the social support prime provided benefits when participants were not stressed, this relationship did not hold when participants were stressed. Stress is correlated with higher calorie consumption, with particular focus on high-fat foods (McCann et al., 1990; Michaud et al., 1990; Ng & Jeffrey, 2003). Study 1 replicated this finding, showing that people who were stressed consumed more Doritos and M&Ms candies overall than people who were not stressed. The findings did not, however, support the prediction that the social support prime of texting a friend would help participants eat less when they were stressed. In fact, there were no differences

between participants in the stress condition, regardless of whether they texted a friend, texted a computer, or saved a message.

Theoretical contributions

Study 1 contributes to the social support and health literature in several ways. First, Study 1 establishes that priming social support using social media provides the immediate benefit of helping people resist consuming high-fat food compared to controls. Previous work suggests that both having a social support contact physically present and making people think about a social support contact provides people with the psychosocial resources they need to perceive tasks as less challenging (Schnall et al., 2008). These psychosocial resources are even more powerful when people are provided with support that is nondirective and nonevaluative (Harber et al., 2005; Kamarck et al., 1990). Thus, it makes sense that having a person engage in the simple communicative act of sending a content-neutral message to a friend without receiving a response had the power to influence eating behavior. This finding is consistent with previous work demonstrating that social support is an important factor in improving people's weight loss success over time (e.g., Anderson et al., 2010; Kayman et al., 1990; Tate et al., 2011). The knowledge that a social support prime can help people to make healthier eating choices is valuable for understanding how social support contributes to long-term weight loss success.

Second, Study 1 establishes social media as a social support prime that is useful in health contexts. Previous studies have demonstrated the benefit of priming social support, but these studies either asked participants to imagine a social tie, or view a photograph of the person (Master et al., 2009; Schnall et al., 2008). This study shows that a more minimal social support prime of having a person text a friend is sufficient to help people make healthier eating decisions. Study 1 not only marks the first successful attempt to prime social support using social

media for this purpose, but also demonstrates the usefulness of this intervention in a weight loss context.

Third, this study marks the first research to test the impact of a social support prime on behavior. Studies have explored how priming, or making people think about, social support impacts the way that people perceive challenges (e.g., Master et al., 2009; Schnall et al., 2008), but Study 1 provides the first evidence that a social support prime can impact the way that people behave in response to a challenge. This finding is consistent with studies showing the importance of social support for weight loss success (Anderson et al., 2010; Kayman et al., 1990; Tate et al., 2011) and provides evidence that a social support prime can help people to make healthier eating decisions.

It is important to note that the main finding from Study 1, that a social support prime helped reduce food consumption when a person was not stressed, was supported for the Doritos dependent variable, but not for the M&Ms candies variable. The only difference that emerged for M&Ms candies replicated previous research, showing that people who were stressed ate more M&Ms than people who were not stressed. In previous research exploring the effects of ego-depletion on food consumption, M&Ms and Doritos were used along with chocolate chip cookies to assess the effects of ego-depletion on eating (Ward & Mann, 2000). Ward and Mann (2000) explored these effects by totaling all of the food participants ate, rather than assessing each variable separately. In Study 1, the same findings did not emerge when the total amount of food people ate was compared between the experimental conditions.

This discrepancy may have arisen because people respond differently to these two types of foods. Recent research demonstrates that milk chocolate has different impact on emotions, mood and energy levels than a savory snack, such as crackers with cheese spread, and these

differences are often dependent on people's tendency toward high- or low-anxiety (Martin, Antille, Rezzi, & Kochhar, 2011). These foods are markedly similar to those used in Study 1, perhaps explaining why people responded differently to these two types of food in Study 1.

While Study 1 demonstrates that a social support prime provides psychosocial resources that help people engage in healthier eating behavior, the texting intervention did not, however, affect stressed participants' decisions to eat less high-fat food. Although the finding that people ate more high-fat food when they were stressed is consistent with previous studies (McCann et al., 1990; Michaud et al., 1990; Ng & Jeffrey, 2003), there were no differences in food consumption between the social support conditions once participants were stressed. Consistent with this eating data was the finding that stressed participants' perceptions of their social support network did not differ between the social support prime conditions. Findings from this study did not support the prediction that priming social support could be used as an intervention for stress that would lead people to eat less high-fat food after texting a friend.

While the hypothesized results from Study 1 contribute to the literature, one particularly interesting and unexpected finding emerged beyond the predictions. People who texted a friend and were stressed ate more Doritos and M&Ms than those who were not. This finding raises the question of why the combination of stress and the social support prime did not impact consumption of high-fat food compared to stressed participants in the control prime conditions, when texting a friend led to decreased eating when the person was not stressed?

Why does texting a friend lead people to consume less high-fat food when they are not stressed, but does not provide the same benefit for stressed participants? Several possible explanations might explain these results. First, it's possible that the addition of stress to this scenario overwhelmed the positive benefit of the social support prime. Stressed participants'

perceptions of their social support network were consistent with this idea, as perceptions of social support did not differ based on whether they texted a friend, texted a computer, or saved a message. Recall that the social support prime used in this study was a minimal prime, which simply involved sending a content-neutral message to a friend, without requiring a response. Consider this in contrast to the stress that participants experienced from completing a challenging mental arithmetic task, which they were led to believe was easy for most other participants to complete. It may appear that stress overrides the positive benefit that individuals experienced when they texted a friend in the no stress condition. Upon closer examination this explanation seems unlikely. If we compare the stress and no stress conditions across the other social support prime conditions (text a computer, save a message), there were no differences in food consumption. This finding is particularly interesting because it suggests that stress did not impact eating behavior for the other priming conditions.

A second potential explanation for this behavior might be that participants perceived the social support prime differently when they were stressed. Texting a friend when stressed made people *more* willing to reach out to their support network for help than people who texted a friend and were not stressed. When people were primed with social support, they felt that people in their social support network were more helpful with problems, but this identification did not impact eating behavior. Alternatively, stressed participants' perceptions of their network did not differ between the three social support prime conditions.

One possibility for this puzzling result is that these differential perceptions of the social support prime between participants who were stressed and those who were not led participants to make different mental associations with food. Research provides evidence for this as studies have shown that when people are physically stressed, from fatigue, age and other factors, their

perceptions of challenges in the physical world become more extreme (Bhalla & Proffitt, 1999; Proffitt et al., 2003). While social support is generally viewed as having positive impact on health and weight loss (e.g., Anderson et al., 2010; Black et al., 1990; Kayman et al., 1990; Tate et al., 2001; Wing & Jeffery, 1999), the findings from Study 1 suggest that there are certain circumstances where priming social support will not have the same positive impact on healthy eating behavior.

Indeed, research on social facilitation of eating suggests that people tend to eat larger meals in the presence of others and eat more dessert in the presence of friends than strangers (Clendenen, Herman, & Polivy, 1994; Patel & Schlundt, 2001). People also consume a greater percentage of calories from fat and protein in social contexts than when they eat meals alone (Patel & Schlundt, 2001). Eating behaviors appear to be partially determined by socially-derived norms surrounding eating. Roth, Herman, Polivy and Pliner (2001), for example, have identified the matching norm, which suggests that people tend to model the amount of food they consume based on the consumption patterns of the people around them.

Although participants in the present study were not eating in a social context, the social support prime may have led participants to make the mental association between their social contact and food. When people were not stressed, the psychosocial resources activated by the social support prime helped people face the challenge of healthy eating, despite potentially bringing up thoughts of food. For people who were stressed, stress worked against the operation of these psychosocial resources, making it more difficult for people to make healthy eating decisions (Bhalla & Proffitt, 1999; Proffitt et al., 2003). The fact that the social support prime did not affect eating when participants were stressed makes it important to understand 1) how the social support prime impacted participants' thought processes, and 2) whether thought processes

differ when a social support prime is combined with stress. To explore these issues Study 2 uses a lexical decision-making task designed to identify whether the social support prime from Study 1 is more likely to activate thoughts related to food when people are primed with social support and when they are stressed.

Conclusion

The present study demonstrated that a social support prime (texting a friend) provided positive benefits by reducing unhealthy eating, but only when participants were not stressed. People in this study consumed more high-fat food overall when they were stressed. The social support prime did not impact eating behavior when people were stressed. The study that follows explores the psychological processes behind these findings.

CHAPTER 5

STUDY 2: PSYCHOLOGICAL MECHANISMS BEHIND THE EFFECTS OF SOCIAL SUPPORT ON EATING

Rationale & Hypotheses

Study 1 revealed that the social support prime of texting a friend leads to decreased consumption of unhealthy foods (Doritos) compared to having participants save a message in their phone. This effect did not emerge when people were stressed. Instead, when people were stressed eating behavior did not differ when they texted a friend, texted a computer or saved a message. While Study 1 demonstrated how stress and social support impact eating, it sheds little light on psychological processes, which play an important role in eating (e.g., Macht, 2008; Ng & Jeffery, 2003). While previous studies have shown that social support provides people with psychosocial resources to face challenging circumstances (e.g., Master et al., 2009; Schnall et al., 2008), little is known about the psychological processes behind these resources.

Previous research has established that both stress and social support influence psychological processes (e.g., Asch, 1953; Lazarus & Folkman, 1984; Mikulincer, Birbaum, Woddis & Nachmias, 2000). Understanding how stress and social support impact thought processes, both independently and in combination, will help to explain why texting a friend affects eating behavior, but fails to do so when a person is stressed. Study 2 seeks to identify the psychological mechanisms driving the patterns of eating observed in Study 1.

Priming research suggests that contextual differences (e.g., how a person is feeling, who they're with, their physical environment) can influence the way people process information by affecting how accessible related constructs are in memory (Higgins & King, 1981). Higgins

(1996) suggests that the closer the relationship between a prime and knowledge stored in memory, the more likely the related knowledge will be activated when the concept is primed. For example, if people tend to eat more when they experience everyday stress, they should form a mental association between stress and food. Subsequently, the experience of stress should make thoughts of food more accessible and more likely to be activated. Study 1 indicated that people who were stressed ate more high-fat food, which in combination with findings from previous studies that show a similar relationship between stress and eating (e.g., McCann et al., 1990; Ng & Jeffrey, 2003), suggests that the link between stress and eating is a commonly formed association. Thus, for many people stress should make thoughts of food more cognitively accessible.

In the case of a social support prime, thoughts that are closely related to social support in memory should also make thoughts of food more cognitively accessible. A wealth of research in social psychology, exploring phenomena such as social influence and social facilitation, suggests that social context plays an important role in impacting the way people think and behave (e.g., Asch, 1953; Huguet, Galvaing, Monteil & Dumas, 1999; Levine & Moreland, et al., 1993; Zajonc, 1965). Social behavior can activate thoughts of food, and these thoughts can influence eating behavior. People eat larger meals with higher percentages of fat and protein in the presence of others than when they are alone. They also eat more dessert in the presence of friends than strangers (Clendenen et al., 1994; Patel & Schlundt, 2001). While the bulk of these studies have been conducted in social contexts, with physically co-present actors, texting a friend should activate a similar mental representation. According to this rationale, texting a friend should make people think of social interaction, and therefore should lead to thoughts of food to be more cognitively accessible.

This prediction is somewhat inconsistent with the eating data from Study 1. Recall that participants who sent a text message to a friend ate less when they weren't experiencing stress compared to participants who saved the same message in their phone. If a social support prime makes thoughts of food more cognitively accessible in general, why would non-stressed people eat less rather than more? Drawing on the rationale for Study 1, priming social support provided people with psychosocial resources that helped them engage in self-control (Master et al., 2009; Schnall et al., 2008). In Study 1, this benefit to self-control was only evident when participants were *not* stressed. For these individuals, while the social support prime may have activated thoughts of food due to mental associations between social concepts and food, it apparently provided sufficient psychosocial resources to engage in self-control in the presence of high-fat food. In contrast, when participants were stressed the psychosocial resources primed by the communicative act were not sufficient to overpower the effects of stress and help people to resist the food. Stress holds its own association with food, particularly with overeating high-fat food. Thus, the addition of stress to this scenario led to additional mental associations between stress and food, which led to overeating in Study 1.

Study 2 explores thoughts activated by stress and the social support prime from Study 1 to better understand the psychological processes driving eating behaviors in Study 1.

Current study

Using the experimental manipulations from Study 1, Study 2 examines the accessibility of thoughts related to social support and food. While self-report scales are widely used in social psychology and communication research to assess attitudes and perceptions, researchers suggest that people have a great deal of difficulty engaging in introspection and accurately assessing their own mental states (e.g., Wilson & Dunn, 2004). Wilson and Dunn argue this lack of self-

knowledge results not only from motivational processes, which often involve attempts to suppress unwanted thoughts and feelings, but also from the limitations of conscious awareness. They argue that unconscious processes are often important for perception, attention, learning, emotion and motivation (Wilson, 2002), and thus should be not be overlooked when assessing the accessibility of thoughts.

In addition to people's difficulty with self-knowledge, self-report often involves not only considering one's current mental state, but also evaluating other factors that might be related to the self-report measurement. For example, in one study researchers exposed participants to a stressful event and subsequently explored social support seeking using self-report scales (Lazarus & Folkman, 1984). Lazarus and Folkman (1984) argued that the problem with using self-report in the case of this study was that self-report requires people to consciously think about personal, cultural and contextual factors, making it difficult to determine whether self-report provides a true measurement of thought processes resulting from the experimental manipulation.

Other studies have explored thought processes resulting from priming by assessing cognitive activation of thoughts. Wegner and Smart (1997) suggest that cognitive activation can be assessed in two ways, but each method provides different criteria for considering a thought to be "active". Initially, they defined a thought as "active" if it was conscious and people reported preoccupation with the thought. Stream of consciousness techniques (e.g., free association writing) have been used to determine whether a thought has been activated, but these techniques may be problematic because they don't recognize thoughts that are activated at unconscious levels (Wegner & Smart, 1997).

Wegner and Smart (1997) have also defined thoughts as "active" if they are more cognitively accessible at a given moment in time. This means the thought should be more

readily used in information processing. Using this definition is advantageous because it works under the assumption that a thought can be accessible before a person can consciously recognize it. Using this definition, the appropriate method for measuring cognitive accessibility involves assessing whether the thought affects performance in a cognitive task (Bargh, Chen, & Currows, 1996; Sherman, Mackie, & Driscoll, 1990). This operational definition is appropriate for the purposes of Study 2 as it removes interference from other factors that a person often considers when responding to self-report scales and accounts for unconscious thought processes.

Lexical decision-making tasks (Meyer & Schvaneveldt, 1971) are used in social and cognitive psychology to assess cognitive activation of related concepts (e.g., Mikulincer, Birnbaum, Woddis, & Nachmias, 2000). The basic procedure for a lexical decision-making task involves measuring how quickly people classify strings of letters as words or nonwords. Reaction times to words are assessed and used to measure the cognitive accessibility of thoughts, with faster reaction times indicating higher levels of accessibility (Fischler & Bloom, 1979). In these tasks, participants are exposed to both neutral and target words (i.e., those related to the thought presumed to be accessible). Comparisons are then made between reaction times to neutral and target words to determine whether target words are more cognitively accessible compared to unrelated, neutral words. Importantly, this difference should *not* occur in control comparison conditions. Based on the mental associations that people form between food and social concepts and food and stress, the following predictions are made using a lexical decision-making task to assess the accessibility of thoughts related to food and friendship and social support:

H1: Participants who are stressed will respond more quickly to food words than neutral words.

H2: Participants who text a friend will respond more quickly to food words than neutral words.

H3: Participants who text a friend will respond more quickly to friend words than neutral words.

H4: Participants who are stressed and text a friend will respond more quickly to food words than neutral words.

H5: Participants who are stressed and text a friend will respond more quickly to friend words than neutral words.

In addition to testing the psychological processes behind the eating behaviors in Study 1, Study 2 seeks to determine whether the eating behaviors in Study 1 will be observed following the use of the proposed lexical decision-making task. The introduction of the lexical decision-making task inserts a 7-minute period between the experimental manipulations and eating dependent variable, which is likely to interfere with the texting manipulation. It is possible that the effects observed in Study 1 may not be observed given this change in the study design, but it will be useful to understand whether the effects of stress and a social support prime on eating are lasting and resilient to this interference. The following predictions are made, consistent with the findings from Study 1:

H6: Participants who text a friend will eat less high-fat food than participants who save a message in their phone.

H7: Participants who are stressed will eat more high-fat food than participants who are not stressed.

H8: Participants who are stressed and text a friend will eat more high-fat food than participants who text a friend, but are not stressed.

Study 2 explores the accessibility of thoughts related to social support and food in a 2 (stress manipulation: stress, no stress) x 2 (social support prime: text a friend, save a message) fully-crossed factorial experiment. Study 2 uses the same stress and social support prime manipulations from Study 1, but the procedure from Study 1 is altered in three ways. First, the text a computer condition is excluded from Study 2, as there were no differences between this condition and the social support prime conditions, both when participants were stressed and when they were not stressed. Second, Study 2 includes a lexical decision-making task immediately following the manipulations to determine the accessibility of thoughts related to social support and food. Words related to stress were also included in the lexical decision-making task to determine whether the experimental manipulation of stress would manifest in a lexical decision-making task via the cognitive accessibility of stress-related words. Third, Study 2 includes only the Doritos eating dependent variable to assess eating behavior, as the M&Ms snack did not impact eating behavior associated with the manipulations used in Study 1.

Participants were provided with food following the lexical decision-making task using the same procedure from Study 1 to determine whether stress and the social support prime continued to have the same effect on eating behavior. As noted, Study 2 does not directly replicate the eating procedure from Study 1 given the inclusion of the lexical decision-making task.

Methods

Participants and recruitment

Participants were recruited, initially screening out participants with potential eating disorders, to participate in an experiment exploring health perceptions, in which they were asked to complete two tasks, answer some questions and eat a snack. Participants were recruited

through an online portal that advertises ongoing research studies (http://susan.psych.cornell.edu) and were compensated with either extra course credit or $5 cash.

Participants were 150 undergraduate students enrolled in psychology, human development, and communication classes at a large university in the Northeastern United States. Twenty-nine percent (*n*= 43) of participants were male and 71 percent were female (*n*= 107). The average Body Mass Index (BMI) of participants was 23.16 (*SD*= 4.58), which falls within the World Health Organization's standards for normal, or healthy BMI.

Manipulations

Similar to Study 1, the experiment was a 2 (stress manipulation: stress, no stress) x 2 (social support prime: text a friend, save a message) between-subjects experiment. This experimental design resulted in four conditions: 1) a stress condition where participants texted a friend (*n*= 37), 2) a stress condition where participants saved a message in the notepad of their phone (*n*= 39), 3) a no stress condition where participants texted a friend (*n*= 36), and 4) a no stress condition where participants saved a message in the notepad of their phone (*n*= 38).

The manipulation designed to induce stress was identical to the manipulation used in Study 1. Participants were randomly assigned to complete a mental arithmetic task (Kamarck et al., 1990), subtracting from a 4-digit number by 17s aloud in the presence of an experimenter for 3 minutes. The experimenter maintained a stern demeanor throughout the task and led participants to believe that they were checking the speed and accuracy of each response (refer to Chapter 4 for detailed review).

Participants assigned to the no stress condition completed the same control task as Study 1, which involved a written arithmetic task of subtracting by 3s from a 3-digit number for 3

minutes. Control participants completed the task alone. They were instructed to take their time and told not to be concerned with accuracy.

Participants were asked the same question as Study 1 to assess their stress level. A second question was also included to assess stress attributed specifically to the task ('Right now I am: 1= Feeling great to 5= Stressed out.': *M*= 2.72; *SD*= .84, 'The task I just completed made me feel: 1= Great, 2= Good, 3=A little stressed, 4= Definitely stressed, 5= Stressed out': *M*= 2.91; *SD*= 1.05). Participants also completed the 10-item Perceived Stress Scale used in Study 1 at the end of Study 2 (Cronbach's α = .87; *M*= 2.59; *SD*= .67) (Cohen et al., 1983) to measure their general perceptions of stress at the end of the study (see Appendix for full list of items).

Two of the three social support conditions from Study 1 were used in Study 2. These two conditions include: 1) send a text message to a supportive friend, and 2) type a message into the notepad of a mobile phone. The text of the message read, "Hi there, I'm participating in a study in the Social Media Lab" for the first condition and "I'm participating in a study in the Social Media Lab" for the second condition. The text a computer condition from the first study was not included as no differences existed between this condition and the remaining two social support prime conditions.

Lexical decision-making task

A lexical decision-making task was used to determine which thoughts were more cognitively accessible (e.g., food, friendship/social support, stress) based on the experimental manipulations. The lexical decision-making task was administered using Inquisit software (version 3.0). Participants completed one practice block of 6 trials followed by 3 blocks of 52 trials. The three main blocks of trials were randomly ordered across participants to avoid order effects.

Three sets of target words were chosen to represent concepts related to food, social support, and stress (see Appendix for full list of words). Initial lists of words related to each of these target concepts were gathered using the LIWC 2007 dictionary (Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007). Twenty-seven food words were chosen from the "ingest" category, 24 social support words were chosen from the "social" category and 22 stress words were chosen from the "anxiety", "negative emotion", and "affect" categories. A group of 8 undergraduates were then asked to rate how well each of these words related to food, social support, and stress on a 1 to 7-point likert scale with 1 signifying not at all and 7 signifying very much. Words with ratings lower than 5 were dropped from the final word lists. Bivariate correlations were then run with each set of remaining words. Words with the lowest mean ratings and lowest correlation to other words were dropped. Each final list contained 13 words (see Appendix for lists of words).

Neutral words were chosen based on procedures from previous research (Manguno-Mire, Constans, & Geer, 2005). These words consisted mainly of household items that had no association with the target words (i.e., connections with food, stress, social support, communication, etc.). The final list of neutral words contained 3 words for the practice block and three sets of 13 words for the remaining three blocks of trials. Each set of target words was accompanied by a matched set of neutral words so that comparisons could be made comparing specific neutral words to target words.

Using procedures from previous research, the list of nonwords was generated by taking neutral 5 to 8 character nouns and verbs that were unrelated to the target words and were not included in the neutral word list and changing one consonant, excluding the end consonants, of each word (Azarbehi, Piercey, & Joordens, 2011; Mikulincer et al., 2000). The final list of

nonwords contained 3 words for the practice block and three sets of 26 words for the remaining three blocks of trials.

Procedure

Prior to coming to the lab, participants were told that they must bring their mobile phone to their scheduled participation session. Using text messaging regularly on a mobile phone was required for participation. Upon arrival at the lab, all participants completed an informed consent form and were randomly assigned to one of the four experimental treatment conditions. After completing either the mental (stress) or written (no stress) arithmetic task, participants answered the stress manipulation check items to ensure the success of the manipulation. Depending on their assigned experimental condition, participants were then asked to text a friend or save a message.

Participants then completed the lexical decision-making task using the Inquisit software. They were instructed to classify the stimuli that appeared on the computer screen as words or nonwords as quickly as possible. Participants were asked to place their index fingers on the "E" and "I" keys, pressing the "I" key when a word appeared on the computer screen and "E" key when a nonword appeared on the screen. They then completed a practice trial consisting of 6 words (3 neutral, 3 nonwords), followed by three blocks of trials consisting of 52 words each (13 target, 13 neutral, 26 nonwords). For each of the four blocks of trials, a "*" was presented at the center of the screen followed by a stimulus word, which appeared for 700 milliseconds followed by 950 milliseconds of blank screen.

Upon completion of the lexical decision-making task, participants were asked to complete a second questionnaire and invited to eat Doritos while they answered the questions. Participants in the text a friend condition were asked to complete questionnaire items about the

person that they messaged. All participants answered general questions about their social support network and stress level. Participants then watched a Youtube video clip of a funny video (the trailer from the movie the Hangover 2) to remove any residual negative affect from the stress manipulation.

A research assistant then removed the snacks from the experiment room (out of participants' view) and asked participants to answer a final questionnaire including a series of baseline questions about their health behaviors (e.g., level of physical activity, eating habits, etc.) and demographic characteristics (e.g., gender). Lastly, participants were debriefed and dismissed.

Measures

At the beginning of the study, participants were asked to answer questions about their level of hunger, fatigue, and mood to ensure that their responses were not driven by these factors (Ward & Mann, 2000).

Similar to Study 1, participants were invited to snack on Doritos to get a measure of how stress and the social support prime impacted eating (Ward & Mann, 2000). M&Ms candies were not provided in Study 2. The same procedure from Study 1 was used: bowls were filled with Doritos and weighed. They were then provided to participants to eat as an extra thank you for participating. Bowls were weighed after participants ate.

While participants ate their snacks, they were asked to complete a final questionnaire (see Appendix for full list of items). Participants in the text a friend condition were asked to complete questionnaire items about the person that they text messaged. These original items were rated on a 10-point likert scale and related to participants' perceptions of the friend and their relationship with the friend (e.g., 'How friendly is this person?', 'How willing would you be to turn to this person for help with a problem?', 'How close are you to this person?', 'How willing would you

be to spend time with this person when you want to have fun?', 'How willing would you be to spend time with this person when you want to relax?').

All participants responded to items about their social support network using the 12-item Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988) to determine whether texting a friend primed social support constructs, compared to saving a message (Cronbach's α= .91). This scale consisted of statements rated on a 5-point likert scale that relate to perceptions of family members and close social ties (e.g., 'There is a special person who is around when I am in need.', 'My family really tries to help me.', 'I can talk about my problems to my friends.') (*M*= 4.18; *SD*= .70). See Appendix for full list of items.

Participants completed a final questionnaire after the snacks were removed. They were first asked questions about their age, gender, height, and weight. Lastly they completed the Dutch Eating Behavior Questionnaire used in the first study, which consists of 33 items and was used to classify participants as 'restrained,' 'emotional,' and 'external' eaters (Van Strien et al., 1986). Scales for restrained (Cronbach's α = .92), emotional (Cronbach's α = .95), and external eaters (Cronbach's α = .83) were created with the items from each subscale, all with high item reliability.

Procedure summary

Below is a brief summary of the experimental procedure. Participants completed the following, which took less than 30 minutes in total:

1) provided consent for participation.
2) completed an arithmetic task (stress/no stress manipulation)
3) filled out stress measure
4) sent (or saved) a text message using mobile phone (social support prime)

5) completed a lexical decision-making task using Inquisit 3 software.
6) ate Doritos while completing questionnaire items about their social support network and stress level
7) watched a funny Youtube video clip
8) Doritos removed by the experimenter
9) filled out a post-study survey assessing eating and exercise behaviors and demographic characteristics.
10) received debriefing and compensation.

Lexical Decision Data Trimming

Lexical decision data were trimmed to eliminate errors following procedures from previous research (Mikulincer et al., 2000). Reaction times greater than 1200 milliseconds were excluded from the analysis as errors. This trimming resulted in the removal of 3.75% (*N*= 822) of the reaction times for words and nonwords. Four participants' responses were excluded from the data due to software errors that ended the lexical decision-making task prematurely, resulting in incomplete data for these individuals.

Data analysis

Prior to conducting data analyses to test the predictions for this study, participants' eating and exercise behaviors and level of hunger, fatigue, and mood were compared between the experimental treatment conditions to ensure that no differences existed based on these individual differences. These factors did not differ between conditions. Therefore these variables were not included in the subsequent analyses.

Following procedures from previous research, correct reaction times (i.e., reaction times for correct classification of a string of letters as a word) for each participant were averaged based

on the target stimuli (food words, social support words, stress words, neutral words). In order to determine whether the stress and social support manipulations impacted the accessibility of each type of target words, a series of three ANOVAs (one for each type of target word) were conducted. These ANOVAs included only the three-way interaction between the following variables as the predicted effect on the reaction time dependent variable: stress manipulation, social support prime and word type (target vs. neutral) (Mikulincer et al., 2000). According to previous research exploring word accessibility using a lexical decision-making task, the reaction time to target words must be significantly faster than the reaction time to neutral words for a target word to be deemed more cognitively accessible (Mikulincer et al., 2000).

Following procedures from Study 1, an ANOVA was used to assess the effects of stress and the social support prime on the amount of food consumed (Doritos) by participants. Given that eating is often driven by factors beyond those manipulated in this study, such as a person's preference for a particular food, participants who did not consume food were excluded from the analyses. The number of participants who chose not to eat was similar across all conditions, suggesting that the decision to eat nothing was not driven by the stress or social support prime factors that were manipulated in this study. One-hundred and seventeen participants were included in this analysis: 1) stress, text a friend (N= 30), 2) stress, save a message (N= 30), 3) no stress, text a friend (N= 27), 4) no stress, save a message (N= 30). Square root transformations were conducted to normalize the eating data for analysis due to large amounts of variance in the amount of food consumed (Field, 2009). All tables include raw data for food weights (in grams) while in-text means and standard errors reflect transformed data.

Results

Stress manipulation check

Participants were asked two questions as a manipulation check to assess their stress level after they completed their initial task, which in the stress condition was a mental arithmetic task and in the no stress condition was an unmonitored, written arithmetic task. Stressed participants responded that they felt significantly more stressed "right now" and that the task made them feel significantly more stressed (M= 3.04, SE= .78; M= 3.61, SE= .90) compared to people in the no stress condition (M= 2.39, SE= .79; M= 2.20, SE= .64), $t(148)= 5.07$, $p < .001$, $t(148)= 11.01$, $p < .001$. Thus, the stress manipulation in this study successfully induced higher stress levels.

Stress, social support and accessibility of food-related thoughts

The first analysis of the lexical decision data explored the effect of stress and social support on the accessibility of food-related thoughts by comparing the difference in reaction times to food-related words to the reaction times to neutral words. Pairwise comparisons were conducted to determine whether significant differences existed between food words and neutral words based on social support, stress, and the interaction between stress and the social support prime. See Table 5.1 for mean reaction times to food words by condition. As predicted in H1, people in the stress condition responded more quickly to food words (M= 438.65, SE= 19.25) than neutral words (M= 501.88, SE= 19.37), $p < .05$, $\eta^2= .02$ (see Figure 5.1). People who texted a friend also responded more quickly to food words (M= 436.18, SE= 19.38) than neutral words (M= 502.93, SE= 19.50), $p < .05$, $\eta^2= .02$, supporting H2 (see Figure 5.2). Lastly, as predicted in H4, people who were both in the stress condition and texted a friend responded more quickly to food words (M= 433.94, SE= 26.86) than neutral words (M= 511.17, SE= 27.58), $p < .05$, $\eta^2= .01$ (see Figure 5.3).

Stress, social support and the combination of these factors all made thoughts of food more cognitively accessible, supporting H1, H2 and H4. No other differences were observed in participants' reaction times between food and neutral words.

Table 5.1: Means and standard errors for reaction time to food words compared to neutral words based on stress and social support prime manipulations.

Condition		Word Type	M	SE
No Stress	Text Friend	Food	438.42	27.96
		Neutral	494.69	27.58
	Save Message	Food	485.94	26.86
		Neutral	496.33	26.86
Stress	Text Friend	Food	433.94	26.86
		Neutral	511.17	27.58
	Save Message	Food	443.35	27.58
		Neutral	492.59	27.58

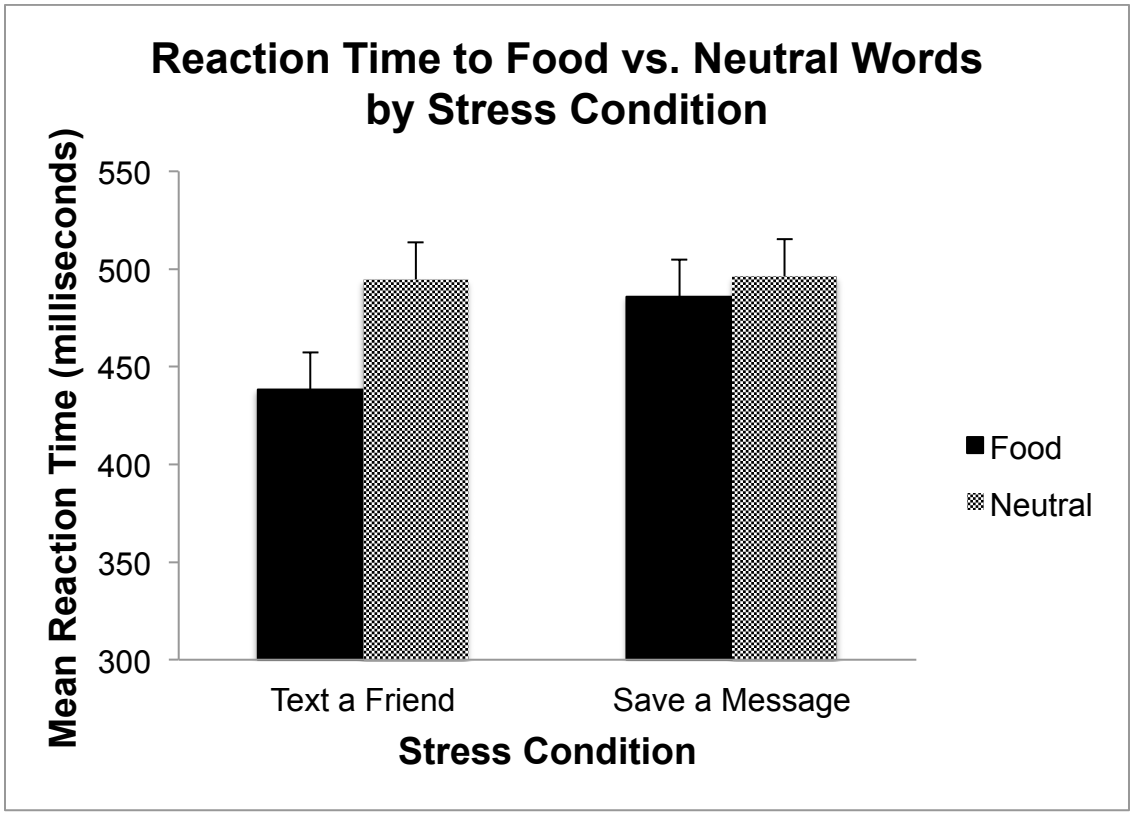

Figure 5.1: Reaction time to food versus neutral words by stress condition (H1).

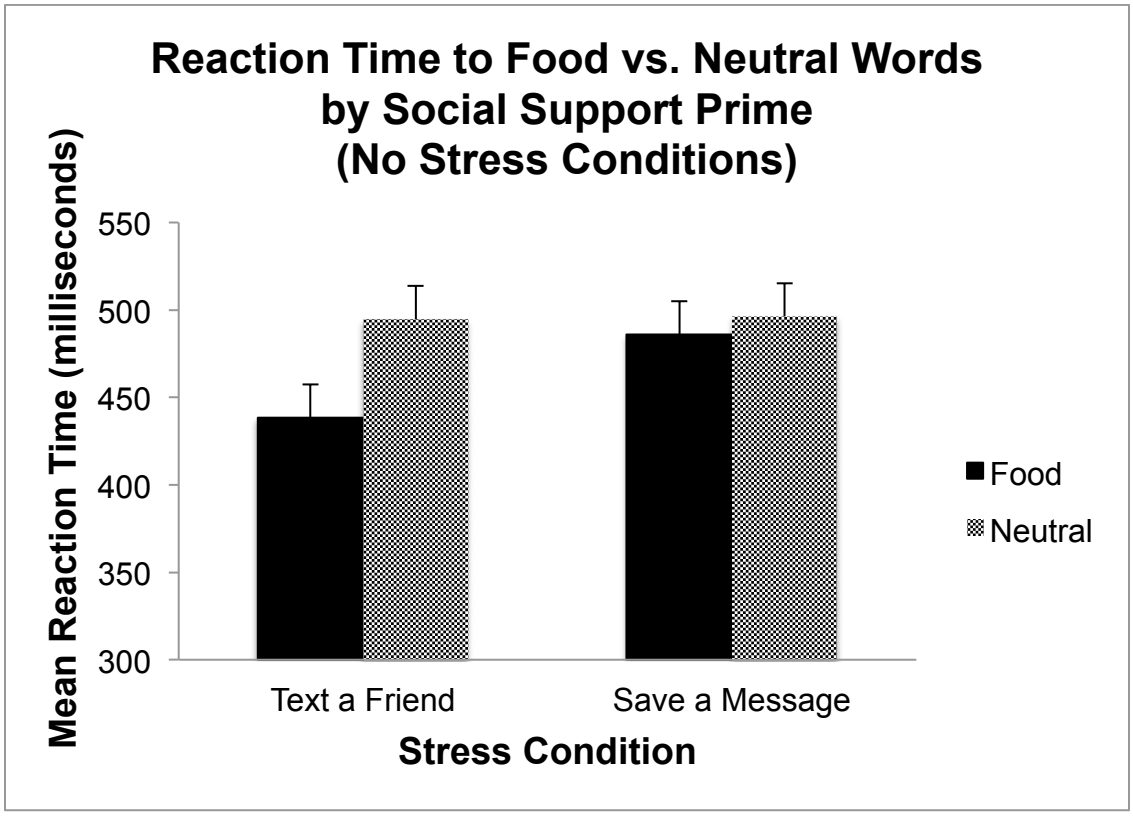

Figure 5.2: Reaction time to food versus neutral words by social support prime for no stress conditions (H2).

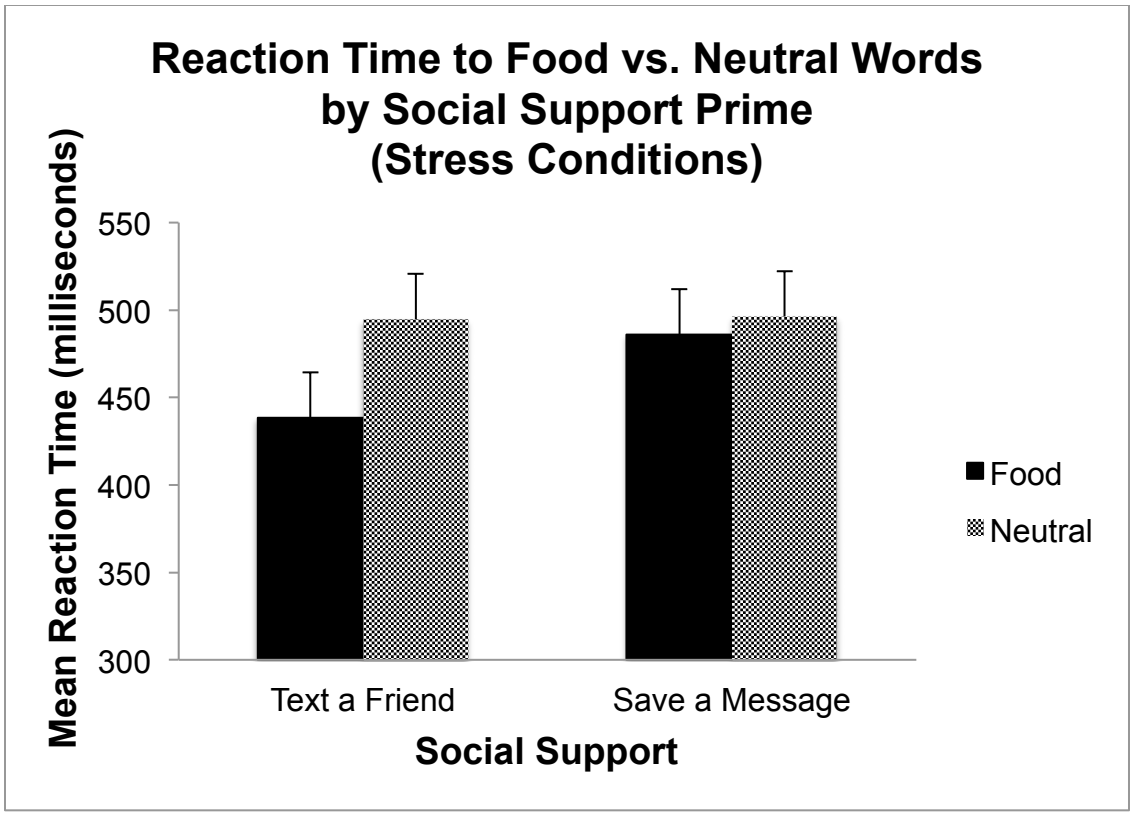

Figure 5.3: Reaction time to food versus neutral words by social support prime for stress conditions (H4).

Stress, social support and accessibility of social support-related thoughts

The second analysis of the lexical decision data explored the effect of stress and the social support prime on the accessibility of social support-related thoughts by comparing the differences in reaction times to social support-related words to neutral words. The second ANOVA did not reveal a significant three-way interaction between stress, social support and word type, $F(7, 294)= 1.01$, $p = .43$, $\eta^2= .02$. See Table 5.2 for mean reaction times by condition.

Pairwise comparisons were conducted to test the hypotheses that people primed with social support would respond more quickly to social support words than neutral words (H3) and that people who were stressed and primed with social support would respond more quickly to

social support words than neutral words (H5). No significant differences emerged in participants' reaction times to social support and neutral words between the stress condition, social support condition, and the interaction between these conditions ($p > .05$). Thus the hypotheses that the social support prime (H3) and the combination of stress and the social support prime (H5) would make thoughts of friendship and social support more accessible were not supported.

Table 5.2: Means and standard errors for reaction time to friend words compared to neutral words based on stress and social support prime manipulations.

Condition		Word Type	M	SE
No Stress	Text Friend	Friend	468.03	27.48
		Neutral	489.98	27.09
	Save Message	Friend	493.40	26.37
		Neutral	532.41	26.37
Stress	Text Friend	Friend	461.25	25.70
		Neutral	471.25	26.03
	Save Message	Friend	464.61	26.37
		Neutral	518.76	26.37

Stress, social support and accessibility of stress-related thoughts

The third analysis assessed the influence of stress and social support on the accessibility of stress-related thoughts, comparing differences in reaction times to stress-related words to neutral words. Stress words were included in the lexical decision-making task to determine whether the experience of stress manifested in the cognitive accessibility of stress-related words. No formal hypotheses were proposed in conjunction with stress-related words. The third ANOVA did not reveal a significant three-way interaction between stress, social support and

word type, $F(7, 294) = .13$, $p = 1.00$, $\eta^2 = .003$. See Table 5.3 for mean reaction times by condition.

Table 5.3: Means and standard errors for reaction time to stress words compared to neutral words based on stress and social support prime manipulations.

Condition		Word Type	M	SE
No Stress	Text Friend	Stress	493.25	27.62
		Neutral	496.16	27.62
	Save Message	Stress	472.66	27.26
		Neutral	489.37	26.90
Stress	Text Friend	Stress	503.74	27.26
		Neutral	491.18	27.26
	Save Message	Stress	478.04	27.26
		Neutral	492.38	27.62

Further pairwise comparisons revealed no differences in reaction times to stress words and neutral words between the stress condition, social support condition and the interaction between these conditions ($p > .50$). Thus, while participants were significantly more stressed after completing the stress manipulation according to self-report measurements, this did not translate to greater accessibility of thoughts related to stress in the lexical-decision-making task.

In summary, the lexical decision-making task analyses revealed that stress and the social support prime, both separately and in combination, led to greater accessibility of food-related thoughts, but did not lead to greater accessibility of stress- or social support-related thoughts. Additionally, these results suggest that only the social support prime (texting a friend) and stress in this study impacted the accessibility of thoughts related to food, as there were no differences in reaction times for participants in the control conditions (save a message, no stress).

Stress, social support and eating

Participants were offered food to eat after they completed the experimental manipulations and lexical decision-making task. An ANOVA with stress and the social support prime as independent variables and the amount of Doritos consumed as the dependent variable was used to test the hypotheses. This analysis revealed a significant main effect for stress ($F(1, 113)= 4.11, p < .05, \eta^2= .04$), no main effect for social support ($F(1, 113)= .14, p = .71, \eta^2= .001$), and no interaction effect for the social support prime and stress conditions ($F(1, 113)= .41, p = .52, \eta^2= .004$). Pairwise comparisons were conducted to test the hypotheses, but these comparisons did not support the hypotheses that participants who were not stressed would eat less after texting a friend (H6), stressed participants would eat more than participants who were not (H7) and participants who were primed with social support (texted a friend) would eat less when they were not stressed compared to participants who were stressed (H8). Counter to H7, stressed participants ate less than participants who were not stressed, $p < .05$. See Table 5.4 for raw means of Doritos consumed (in grams) by condition.

Table 5.4: Raw means and standard deviations for the impact of the social support prime and stress on eating Doritos (in grams).

Condition		Doritos	
		M	SD
No Stress	Text Friend	18.52	15.59
	Save Message	22.03	17.03
Stress	Text Friend	17.26	14.98
	Save Message	18.34	15.54

While the eating findings from Study 1 were not observed, the 7-minute lexical decision task between the experimental manipulations and eating very likely interfered with any thoughts

that were primed by the text message manipulation. The introduction of the lexical decision-making task to the experimental procedure creates two issues. First, priming effects are short-lived and the 7-minute delay introduced by the lexical decision-making task was sufficient enough to erase the effects of the manipulations on eating. Second, the lexical-decision making task included words related to food, social support and stress, which may have primed these concepts and influenced eating. Thus, the results observed here should be interpreted with extreme caution.

Perceptions of social support

Participants' perceptions of social support were assessed at the conclusion of study to determine how the combination of the stress and social support manipulations impacted the way that they perceived their social support contacts. An ANOVA was conducted comparing participants' perceptions of social support between the four experimental treatment conditions. Perceptions of social support were assessed using the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988). While this ANOVA did not reveal an overall significant effect ($F(3, 146)= 1.79, p = .15, \eta^2 = .04$), pairwise comparisons revealed a significant difference in social support perceptions between the no stress, save a message condition ($M= 3.99, SE= .11$) and the stress, text a friend condition ($M= 4.36, SE= .11$), $p < .05$. People who were not stressed and saved a message into their phone felt that they had fewer social support resources than people who were stressed and texted a friend. There were no other differences between conditions (no stress, text a friend: $M= 4.17, SE= .11$; stress, save a message: $M= 4.18, SE= .11$), $p > .24$). This finding suggests that the social support prime was not sufficient on it's own to evoke perceptions of social support, but that the addition of stress made participants have more positive perceptions of their social support network.

In addition to assessing overall perceptions of social support, participants who texted a friend were asked to answer a series of questions about their friend. Responses from participants in the stress and no stress condition were compared to determine whether people perceived the person that they texted differently when they were stressed. Interestingly, participants who sent a message to a friend after the stress manipulation reported that they knew the friend better (M= 9.13; SD= 1.07) than participants who saved a message in their phone (M= 8.61; SD= 1.18), $t(72)= 1.99$, $p = .05$. The other items did not reveal differences in participants' perceptions of the friend ($p > .25$). Taken together, these findings suggest that the combination of stress and social support lead people to perceive social support contacts more positively.

Discussion

Study 2 sheds some light on the psychological processes driving the eating behaviors in Study 1. The social support prime of texting a friend led thoughts of food to be more cognitively accessible, as did stress. Thoughts of food were also more cognitively accessible for participants who were stressed and subsequently primed with social support. While it was predicted that thoughts of social support and friendship would be more accessible for participants who texted a friend, this was not the case. In fact, no differences were observed across conditions in participants' ability to access thoughts of social support. The same was true for the accessibility of thoughts of stress, as people did not respond differently to stress words compared to neutral words in any of the experimental conditions.

Study 2 also explored the possibility that the experimental manipulations used in Study 1 would affect eating in the same way as Study 1, despite the addition of the 7-minute lexical decision-making task in between the manipulations and eating. The same effects were not observed in Study 2. On the contrary, the only significant difference observed runs in direct

opposition to the findings from Study 1, with participants in the stress condition eating *less* than participants in the no stress condition. While it may seem that the lexical decision-making task reversed the effect of stress on eating, it is important to recall that participants were exposed to three sets of target words in this task, those related to food, social support, and stress. Additionally, the lexical decision-making task created a time lag between the experimental manipulations and eating. Given that these concepts were primed, along with the experimental manipulations, and the time lag between the manipulations and eating, it is impossible to determine which of these influences led participants to eat less in the stress condition.

Theoretical contributions

The most valuable contribution of Study 2 lies in the illumination of the thought processes driving eating behaviors observed in Study 1. Priming research suggests that contextual differences (e.g., how a person is feeling, who they're with, their physical environment) influence the way people process information making related constructs more accessible in memory (Higgins & King, 1981). As a relationship between a primed construct and knowledge stored in memory becomes closer, it becomes more likely that this related knowledge will be activated when the construct is primed (Higgins, 1996). Study 2 demonstrates that stress and the social support prime from Study 1 led thoughts of food to become more cognitively accessible.

In Study 1, priming social support without stress led participants to eat *less* than those who had saved the same message. If a social support prime activates thoughts of food, why did the increased accessibility of thoughts related to food have different effects on eating depending on stress? We hypothesized that the effect was observed because priming social support gives people psychosocial resources that help them engage in self-control, despite the fact that these

thoughts of food have been primed. While other studies support this idea, showing that people perceive pain as less severe and see a slope as less steep in the presence of social support (Master et al., 2009; Schnall et al., 2008), Study 1 was the first to explore the effect of psychosocial resources provided by social support in the context of eating. Study 2 attempted to identify the mechanism behind the operation of these psychosocial resources by exploring the accessibility of concepts related to social support and stress using a lexical decision-making task. This attempt was unsuccessful as no differences were observed in the accessibility of these concepts between the experimental conditions. Study 2 marks the first attempt to identify the psychosocial resources provided by social support.

The fact that these psychosocial resources were not identified using the lexical decision-making task does not necessarily suggest that these resources weren't available to participants. Rather, it is possible that certain psychological processes are difficult to capture using a lexical decision-making task. Study 2 provides some evidence that psychosocial resources were activated as participants' perceptions of social support differed between conditions. People in the control condition, who were not stressed and saved a message, reported less positive perceptions of their social support network than those who were stressed and texted a friend. In addition, for people who had texted a friend, people who were stressed reported that they knew the person better than people who weren't stressed.

The null findings that were observed with the stress-related target words in the lexical decision-making task further support the suggestion that the lexical decision-making task may not have been appropriate for capturing more abstract concepts. In this study, people who were successfully induced with stress (according to a manipulation check) did not respond more quickly to stress words than neutral words. Considering this finding along with the null effect for

social support-related words, it seems that these concepts and the related thoughts that they prime might be difficult or impossible to identify using a lexical decision-making task. While the lexical decision-making task did not successfully identify these concepts as part of the thought processes behind psychosocial resources, it will be important for future studies to discover the appropriate method for identifying these resources to better understand how they help to improve people's self-control and ability to engage in challenging tasks.

A second important finding from Study 2 that warrants further discussion and exploration, is the finding that the combination of stress and the social support prime increased accessibility of food-related thoughts, but the combination of these factors did not lead to decreased eating in Study 1. Physical depletion impacts the way that the physical world is perceived, with people perceiving distances as further and slopes as steeper under this type of duress (Bhalla & Proffitt, 1999; Proffitt et al., 2003). Emotional distress is related to self-defeating behaviors such as failure to comply with medical routines, self-handicapping and general helplessness. Similarly, ego-depletion research suggests that cognitive and physical depletion elicit the same detriment to self-control (e.g., Baumeister et al., 1998; Muraven et al., 1998; Vohs & Faber, 2007; Vohs & Heatherton, 2000). Because stress is depleting, it seems to lead people to perceive the challenge of resisting unhealthy food as more difficult, making the challenge itself more difficult. As the findings from Study 1 suggest, under stressful circumstances, it seems that the social support prime and stress are competing influences, with stress overwhelming the impact of social support on eating. In the case of Study 1, the social support prime did not provide sufficient psychosocial resources for engaging in self-control in the presence of unhealthy food when a person was stressed. Instead stress intensified negative

affect, making people perceive the thoughts of food that were primed by both stress and social support in a way that encouraged increased, rather than decreased eating.

Conclusion

Study 2 marks an initial attempt to identify the psychological processes driven by stress and a social support prime that affect eating behavior. The present study demonstrated that stress and the social support prime led thoughts of food to be more cognitively accessible. These factors had no effect on the cognitive accessibility of thoughts related to stress and social support, as assessed via a lexical decision task.

CHAPTER 6

GENERAL DISCUSSION

Research in a variety of disciplines has established social support as an important component of mental and physical health maintenance (Kamarck et al., 1990; Kiecolt-Glaser, Garner, et al., 1984; Kiecolt-Glaser, Ricker et al., 1984; Kiecolt-Glaser et al. 1987; Nolen-Hoeksema & Ahrens, 2002). Social support is also particularly beneficial for weight loss, though research has yet to specify how social support impacts weight loss (e.g., Anderson et al., 2010; Black et al., 1990; Kayman et al., 1990; Tate et al., 2001; Wing & Jeffery, 1999).

Scholars have suggested that social support provides people with psychosocial resources that help them cope with aversive stimuli, such as stress or pain (Brown et al., 2003; Kamarck et al., 1990; Master et al., 2009), which may help to explain the positive benefits that social support has for weight loss. Psychosocial resources provided by social support reduce negative arousal to aversive stimuli and alter the way that people perceive the physical world, suggesting that the positive effects of social support are not driven by any kind of direct physical or instrumental support provided by social support contacts (Schnall et al., 2008). In several studies, people who were simply primed to think about social support, by either deeply thinking about a social support contact or viewing a photograph of the person, experienced the same benefits as having a social support contact physically co-present (Master et al., 2009; Schnall et al., 2008).

This dissertation set out to explore the effect that the psychosocial resources elicited by social support had on eating behavior. Previous research has yet to explore the effect that a social support prime has on behavior, only showing that social support primes change the way that people perceive the physical world (Master et al., Schnall et al., 2009). Does a social support

prime provide people with the psychosocial resources that they need to make healthy eating decisions? Is priming social support with a simple communicative act, such as having a person send a text message to a friend, sufficient to elicit the psychosocial resources necessary to impact eating? And finally, how will a social support prime impact eating behavior when a person is stressed?

These questions were explored relying on foundational research from disciplines that ranged from communication and social psychology to medicine and nutrition, which establish that social support generally has positive impact on healthy eating decisions (e.g., Anderson et al., 2010; Kayman et al., 1990; Tate et al., 2011) whereas stress has negative impact on healthy eating (e.g., McCann et al., 1990; Michaud et al., 1990; Ng & Jeffrey, 2003). The positive effect that social support has on healthy eating may be attributed to psychosocial resources (Schnall et al., 2008). Social support reduces arousal to negative stimuli (e.g., Brown et al., 2003; Kamarck et al., 1990; Master et al., 2009), which alters the way people perceive challenges. To understand the effect of social support on the challenge of healthy eating, psychosocial resources were used as a theoretical lens (Schnall et al., 2008).

To understand the effect that stress has on this relationship, research exploring stress and eating and ego-depletion research was employed. Coping with stress uses up physical and cognitive resources that are needed in decision-making about eating (Macht, 2008). It is possible that this mental state, which has been referred to as ego-depletion, makes it difficult for people to engage in self-control as they would normally (Baumeister & Vohs, 2007). This dissertation attempted to use a social support prime to eliminate the effect of stress on eating.

The empirical studies reported on in this dissertation suggest that a minimal social media prime, of text messaging a friend, provides the psychosocial resources necessary to help people

make healthy eating decisions, but that these resources are not sufficient to change eating behaviors when people are stressed. More specifically, Study 1 revealed that the social support prime of texting a friend led to decreased consumption of unhealthy food compared to having participants complete a control task, but this was not the case when people were stressed. Study 2 sought to illuminate the psychosocial resources behind this eating behavior by using a lexical decision-making task to more closely examine thoughts that were activated by the social support prime and stress. Study 2 showed that stress and the social support prime, both individually and in combination, led thoughts of food to be more cognitively accessible, though these factors had no effect on the cognitive accessibility of thoughts related to stress or social support.

This empirical work advances the theoretical work on psychosocial resources, social support and stress in several important ways. In addition, this work pushes the boundaries of theoretical work in CMC, by exploring how theories used to explain communication in these contexts may also apply to communicative acts. Advances to theory in these areas are discussed individually below. Directions for future research to expand findings from this dissertation are then discussed.

Social Support, Psychosocial Resources and Eating

The idea that social support elicits psychosocial resources that help people to cope with aversive scenarios is a rather new to communication and social psychology (e.g., Master et al., 2009; Schnall et al., 2008). The explanation that psychosocial resources are driving the positive effects of social support is compelling given evidence that the same social support benefits can be derived from a mere mental representation of a person and that social support is particularly valuable when it is nondirective and nonevaluative (i.e., non-judgmental) (Harber et al., 2005; Kamarck et al., 1990; Master et al., 2009; Schnall et al., 2008). This dissertation contributes

several important advances to the research on the psychosocial resources provided by social support.

First, the existing research exploring these resources has primarily focused on how social support impacts perceptions, but does not speak to how these resources influence behavior. The influence that these psychosocial resources have on perceptions is quite remarkable. Physical depletion makes people perceive distances as further and hills as steeper (Bhalla & Proffitt, 1999; Proffitt et al., 2003), but when people have access to social support under similar circumstances they perceive a slope as less steep (Schnall et al., 2008). Psychosocial resources in these circumstances help people to perceive the physical world as less challenging.

Social support provides psychosocial resources that help people to perceive these situations as less challenging, but can they make the actual task less challenging? For example, is it also possible that these psychosocial resources will make it easier for a person to walk up a slope? Study 1 of this dissertation is the first research to test the impact of a social support prime on behavior. Priming social support using social media in this study provided the immediate benefit of helping people resist consuming high-fat food compared to controls. This research provides the first evidence that a social support prime can impact the way that people behave in response to a challenge. This finding is consistent with studies showing the importance of social support for weight loss success (e.g., Anderson et al., 2010; Kayman et al., 1990; Tate et al., 2011) and shows that psychosocial resources provided by social support have the power to impact behavior, not just perceptions. The finding that the social support prime impacted eating behavior in this study is particularly powerful when considering the specific behavior of eating, which is influenced both psychological (e.g., mood) and physiological states (e.g., hunger) as

well as individual differences in mood, personality and eating tendencies (e.g., Macht, 2008; Martin et al., 2011; Ward & Mann, 2000).

Second, this work extends the existing work on psychosocial resources by establishing that even a minimal social support prime elicits psychosocial resources. Researchers have suggested that social support is particularly valuable when it is nonevaluative and nondirective (Harber et al., 2005; Kamarck et al., 1990). Previous studies have demonstrated that psychosocial resources are elicited when social support is primed using complex manipulations that either ask participants to think deeply about a social tie, hold their hand, or view a photograph of the person (Master et al., 2009; Schnall et al., 2008). Study 1 establishes that using social media to prime social support impacts eating behavior. The simple communicative act of having a person text a friend with a content-neutral message (and no feedback) was sufficient to elicit benefits from social support, demonstrating that people can gain the benefits from social support simply by engaging in a communicative act that reminds them of the person. This finding is particularly powerful as it suggests that we can harness the power of our social support network without requiring their presence or involvement.

Third, this dissertation marks the first research to explore the thought processes behind psychosocial resources. While Schnall et al. (2008) speculates about these psychosocial resources, by suggesting that the benefits that people derive from these resources might make a person feel more competent, or improve their ability to engage in self-control, research has not yet illuminated these thought processes. The finding from Study 2 that social support primes made thoughts of food more cognitively accessible suggests that certain thought processes behind psychosocial resources can be identified using a lexical decision-making task.

While this research attempted to identify additional thoughts that contribute to these psychosocial resources, no differences emerged in the accessibility of thoughts related to social support. These null findings were also true for stress-related words, which suggests the possibility that a lexical-decision making task may not be an appropriate method for exploring the more abstract thought processes that contribute to these psychosocial resources. While the lexical decision-making task did not successfully identify these psychosocial resources, it will be important for future studies to discover the appropriate method for identifying these resources to better understand how they help to improve self-control and people's ability to engage in challenging tasks.

A final contribution that this research provides to the extant literature on psychosocial resources is its exploration of the impact that psychosocial resources have on a challenge that elicits positive *and* negative arousal. Research has explored how social support affects people's response to challenges that are negatively arousing, suggesting that social support reduces arousal to negative stimuli and alters the way people perceive challenges (e.g., Bhalla & Proffitt, 1999; Brown et al., 2003; Kamarck et al., 1990; Master et al., 2009; Proffitt et al., 2003; Schnall et al., 2008). Studies have not explored whether social support provides similar benefits when people face challenges that are both negatively and positively arousing.

In Study 1, people were presented with the challenge of healthy eating, specifically by being provided with the opportunity to eat unhealthy food. This challenge should have aroused both positive and negative affect. People should be positively aroused by the thought of eating appealing, though unhealthy food, but may simultaneously be negatively aroused either by having to resist temptation, or feeling badly if they do not resist temptation. Study 1 demonstrated that social support provided psychosocial resources that were useful in facing this

challenge, confirming that psychosocial resources provide benefit even when a challenging situation elicits positive and negative arousal.

Contributions to CMC Theory

The social support prime used in Studies 1 and 2 provides some insights to current theories of CMC. In this research, the simple communicative act of texting a friend without receiving feedback was sufficient to elicit benefits from social support. Finding that social support benefits could be derived when social support was primed with social media is important because it suggests that people adapt to their communication environment, even in the absence of communication. While Social Information Processing Theory claims that people adapt to their communication environment by using verbal communication channels as an alternative to the nonverbal channels provided in FtF communication, the findings from this dissertation suggest that people also adapt their thought processes to CMC contexts and this adaptation does not require two-way communication (Walther, 2007).

How is it that sending a simple, content-neutral message to a social support contact could provide the psychosocial resources that helped people to eat less unhealthy food? Recall that the computer-mediated nature of social media allows for reallocation of cognitive resources, which eliminates the necessity of managing nonverbal behaviors and other activities characteristic of FtF communication and gives people more time to compose a message (Walther, 1997). By sending a prompted message, participants in Studies 1 and 2 could spend the majority of their cognitive resources thinking about the social support contact.

While a comparison was not made in this dissertation between FtF social support and the social media social support prime, CMC theory suggests the possibility that the computer-mediated nature of the prime may have intensified social support benefits compared to social

support provided in FtF contexts. CMC users are prone to engaging in overattribution (Lea & Spears, 1992). Walther's hyperpersonal model of CMC suggests that people can engage in overattribution processes in CMC contexts, which can lead to exaggerated positive (or negative) impressions. While the hyperpersonal model is based on communication, findings from Studies 1 and 2 studies suggest that similar processes may occur simply by having a person engage in a communicative act that reminds them of a social support contact. Priming a social support contact in social media should increase activation of the aspects of a person that are most relevant to the immediate circumstances. The similarities between the communicative act used to prime social support in this study and CMC suggest that hyperpersonal processes may extend beyond communication, to encompass communicative acts as well. Future research will be important to test two important possibilities: 1) that social media social support primes will elicit these intensified impressions and provide greater benefit than the physical presence of a social support contact or other types of social support primes used in previous studies, and 2) that social support primes that use a communicative act will provide greater benefits than communicating with the social support contact.

Stress, Social Support and Eating

In addition to exploring the effect of psychosocial resources on eating, this dissertation provides important insights to the stress and eating literature. First, this research marks the first attempt to employ a social support intervention to counteract the negative impact of stress on eating. Study 1 was unable to establish the social support prime as intervention for stress, as stressed participants' eating behavior remained the same in the study regardless of whether they'd been primed with social support.

This null effect suggests that the psychosocial resources provided by social support do not provide universally positive benefits. Social support may have been a particularly problematic intervention in this context because it made thoughts of food more cognitively accessible. These thoughts may have been detrimental because they were cognitively accessible when participants were provided with the opportunity to eat. Future studies should explore whether a social support prime would be a useful for eliminating the effects of stress in contexts where social support prime does not elicit thoughts that run in opposition with the challenging context.

Another important issue worth noting is that Study 1 did not assess participants' stress levels after the social support prime. This procedure was employed because including a second stress measure so soon after the manipulation check would have called unnecessary attention to the effects of the social support manipulation on stress. While research has demonstrated a positive relationship between stress and eating (e.g., McCann et al., 1990; Michaud et al., 1990; Ng & Jeffrey, 2003), the literature on stress and eating does not consistently show that stress increases eating. Instead, studies suggest that the relationship between stress and eating is quite complex and influenced by social, psychological and physiological factors such as emotions, eating tendencies, cortisol reactivity and social context (e.g., Bjorntorp, 2001; Clendenen et al., 1994; Epel et al., 2001; Macht, 2008; Patel & Schlundt, 2001; Ward & Mann, 2000). Therefore, it is possible that the social support prime alleviated some of participants' stress. This explanation seems plausible given that eating differences did not emerge in the control prime conditions between the no stress and stress participants. Future research must develop methods for unobtrusively assessing the impact of social support primes on stress to determine whether

social support provides an intervention that alleviates stress, but does not translate to decreased eating.

Future Directions

The findings from this dissertation shed little light on the effect of social support for people who were stressed. While it was observed in this research and several previous studies that the experience of stress is related to increased eating (e.g., McCann et al., 1990; Michaud et al., 1990; Ng & Jeffrey, 2003), the literature on stress and eating does not consistently show that stress increases eating. Rather, the relationship between stress and eating is complex, being influenced by a variety of social, psychological and physiological factors (e.g., Bjorntorp, 2001; Clendenen et al., 1994; Epel, Lapidus, McEwen, & Brownell, 2001; Macht, 2008; Patel & Schlundt, 2001; Ward & Mann, 2000). Torres and Nowson (2007) suggest that understanding the relationship between stress and eating is further complicated by the methodological limitations of the previous research studies used to explore this relationship. Much of the research on chronic stress is correlational, looking at the relationship between stress and eating, or body weight, over time (e.g., Rosenfeld & Stevenson, 1988; Slowchower, Kaplan, & Mann, 1981), without considering many of the additional factors that may be contributing to this relationship. In addition, research looking at distinct cause and effect relationships between stress and eating only assesses the impact of acute stressors, and thus may exaggerate the impact of stress on eating.

Taken together, the findings from Studies 1 and 2 and Torres and Nowson's (2007) observations about the stress-eating literature suggest that it is important to consider a variety of factors to determine how stress impacts eating behavior. While Study 2 provides only a small glimpse of these processes, it suggests that even the simple combination of stress and social

support introduces a host of psychological factors that effect eating. While some work has been done to identify the psychological processes involved in eating (e.g., Macht, 2008), no known research is available that incorporates the psychological, physiological. and social factors that drive eating behaviors. The findings from Studies 1 and 2 in combination with the extant literature on stress and eating suggest the need to develop a model of stress and eating that acknowledges the complexity of this relationship and considers the psychological, physiological, and social factors that are contributing to the way that people eat under stress. Such a model would be invaluable for understanding how stress contributes to obesity and how interventions might be designed to minimize the impact of stress on obesity.

Conclusion

By demonstrating that social support primed via social media helps people to make healthier eating decisions, this dissertation provides important contributions to the extant literature on social support and psychosocial resources, stress and eating, and computer-mediated communication. With respect to the literature on social support and psychosocial resources this research demonstrated that psychosocial resources elicited from social support have the power to impact behavior, which goes beyond the current literature's claim that these resources impact perceptions. In addition, this research shows that even a minimal social media prime for social support is sufficient to elicit the psychosocial resources necessary to influence eating. Importantly, this work marks the first attempt to understand the thought processes behind psychosocial resources by exploring the thoughts that are activated by social support and stress. In this research, a lexical decision making task was used to successfully assess the accessibility of thoughts related to food.

This research also contributes to the CMC literature by demonstrating that people adapt to their communication environment, even in the absence of communication. This finding is important because it suggests that thought processes elicited by communicative acts are a crucial component for adapting to mediated-communication environments, which goes beyond the claim that this adaptation occurs mainly through verbal communication channels.

Finally, results from this dissertation contribute to the stress and eating literature by making the first attempt to develop a social support intervention for the negative effects of stress on eating. While the social support prime used in this research did not prove to be an effective intervention, it is possible that social support will be useful in counteracting the negative effects of stress in other contexts.

While social support impacts health behaviors in a variety of contexts, this dissertation importantly suggests that simple reminders of social support may serve a similar function for health. While this research explored eating behaviors, it will be important to see whether these simple reminders will be useful in the other health contexts that have been shown to benefit from social support resources.

APPENDICES

Perceived Stress Scale (Studies 1 & 2)

1. In the last hour, how often have you: Felt that you were unable to control the important things in your life.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

2. In the last hour, how often have you: Felt confident about your ability to handle your personal problems.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

3. In the last hour, how often have you: Felt that things were going your way.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

4. In the last hour, how often have you: Felt difficulties were piling up so high that you could not overcome them.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

5. In the last hour, how often have you: Been upset because of something that happened unexpectedly.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

6. In the last hour, how often have you: Felt nervous or "stressed".
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

7. In the last hour, how often have you: Felt that you could not cope with all of the things you had to do.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

8. In the last hour, how often have you: Felt you were on top of things.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

9. In the last hour, how often have you: Been angered because of things that were outside of your control.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

10 In the last hour, how often have you been able to control irritations in your life.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

Dutch Eating Behavior Questionnaire (Studies 1 & 2)

Please respond to each question using a 1 – 5 scale, never (1), seldom (2), sometimes (3), often (4), and very often (5).

1. If you have put on weight, do you eat less than you usually do?

2. Do you try to eat less at mealtimes than you would like to eat?

3. How often do you refuse food or drink offered because you are concemed about your weight?

4. Do you watch exactly what you eat?

5. Do you deliberately eat foods that are slimming?

6. When you have eaten too much, do you eat less than usual the following days?

7. Do you deliberately eat less in order not to become heavier?

8. How often do you try not to eat between meals because you are watching your weight?

9. How often in the evening do you try not to eat because you are watching your weight?

10. Do you take into account your weight with what you eat?

11. Do you have the desire to eat when you are irritated?

12. Do you have a desire to eat when you have nothing to do?

13. Do you have a desire to eat when you are depressed or discouraged?

14. Do you have a desire to eat when you are feeling lonely?

15. Do you have a desire to eat when somebody lets you down?

16. Do you have a desire to eat when you are cross?

17. Do you have a desire to eat when you are approaching something unpleasant to

happen?

18. Do you get the desire to eat when you are anxious, worried or tense?

19. Do you have a desire to eat when things are going against you or when things have gone wrong?

20. Do you have a desire to eat when you are frightened?

21. Do you have a desire to eat when you are disappointed?

22. Do you have a desire to eat when you are emotionally upset?

23. Do you have a desire to eat when you are bored or restless?

24. If food tastes good to you, do you eat more than usual?

25. If food smells and looks good, do you eat more than usual?

26. If you see or smell something delicious, do you have a desire to eat it?

27. If you have something delicious to eat, do you eat it straight away?

28. If you walk past a bakery do you have the desire to buy something delicious?

29. If you walk past a convenience store or a cafe, do you have the desire to buy something delicious?

30. If you see others eating, do you also have the desire to eat?

31. Can you resist eating delicious foods?

32. Do you eat more than usual, when you see others eating?

33. When preparing a meal are you inclined to eat something?

(Van Strien et al., 1986)

Eating and Exercise Behaviors (Studies 1 & 2)

1. Please respond to each question using a 0 – 3 scale, doesn't apply (0), rarely/never (1), sometimes (2), usually often (3). In an average week, how often do you…

a. Eat 4 or more meals per week from sit-down or take out restaurants?

b. Eat less than 3 servings of whole grain products or high fiber starches a day?

(Serving = 1 slice of 100% whole grain bread; 1 cup whole grain cereal like Shredded Wheat, Wheaties, Grape Nuts, high fiber cereals, oatmeal, 3-4 whole grain crackers, 1⁄2 cup brown rice or whole wheat pasta, boiled or baked potatoes)

c. Eat less than 3 servings of fruit a day?

(Serving = 1⁄2 cup or 1 med. fruit or 3⁄4 cup 100% fruit juice.)

d. Eat less than 3 servings of vegetables a day?

(Serving = 1⁄2 cup vegetables, or 1 cup leafy raw vegetables.)

e. Eat or drink less than 2 servings of milk, yogurt, or cheese a day?

(Serving = 1 cup milk or yogurt; 11⁄2 - 2 ounces cheese.)

f. Use 2% (reduced fat) or whole milk instead of skim (non-fat) or 1% (low-fat) milk?

g. Eat more than 8 ounces (see sizes below) of meat, chicken, turkey or fish per day?

Note: 3 ounces of meat or chicken is the size of a deck of cards or ONE of the following: 1 regular hamburger, 1 chicken breast or leg (thigh and drumstick), or 1 pork chop.

h. Use regular processed meats (like bologna, salami, corned beef, hotdogs, sausage or bacon) instead of low fat processed meats (like roast beef, turkey, lean ham; low-fat cold cuts/hotdogs)?

i. Eat fried foods such as fried chicken, fried fish, French fries?

j. Eat regular potato chips, nacho chips, corn chips, crackers, regular popcorn, nuts instead of pretzels, low-fat chips or low- fat crackers, air-popped popcorn?

k. Eat frozen or processed foods such as canned pasta, frozen pizzas, macaroni and cheese?

l. Add a lot of butter/margarine oil, dressing or cheese to salad or vegetables?

m. Eat sweets like cake, cookies, pastries, donuts, muffins, chocolate and candies more than 2 times per day.

n. Drink 16 ounces or more of non-diet soda, juice, other fruit drinks/punch or Kool-Aid a day? Note: 1 can of soda = 12 ounces

o. I eat when I feel sad, disappointed, or depressed.

p. I eat when I feel bored or restless.

q. I eat when I feel stressed or nervous.

r. I don't stop eating before I get too full.

s. When I start eating foods I enjoy, I just can't seem to stop.

t. Usually shop and prepare your own food.

2. In how many of the past 7 days have you: (0-7 days)

a. Engaged in at least 20 minutes of exercise or sports activities that resulted in sweat and heavy breathing. _____

b. Engaged in exercises to strengthen or tone muscles. ____

c. Participated in a physical education class. ____

d. Played an intramural or club sport. ____

Perceptions of Social Support (Study 1)

For the following questions, consider the people you turn to in your life for support by using your phone (such as calling or texting), whether they are your friends, family, or a romantic partner. Whoever your support network may consist of, consider them your **'close social ties'** when answering the following questions. You may think of them as a whole, or of one person in particular with whom you are closest.

1. Please rate your feelings towards your ***'close social ties'*** on a scale from 1 to 10 (1 being not at all friendly and 10 being extremely friendly)

2. Please rate how willing you would be to turn to your ***'close social ties'*** for help with a problem on a scale from 1 to 10 (1 being not at all and 10 being absolutely)

3. Statement: On average, I communicate with my ***'close social ties'*** using my phone frequently. Please rate the validity of this statement on a scale from 1 to 10, 1 being strongly disagree and 10 being strongly agree.

The next set of questions refers to your **'close social ties'** and all responses are on a scale from 1 to 10 (1, 2, & 3 being "not much," 4, 5, 6, & 7 being "A little," and 8, 9, & 10 being "a Great Deal").

5. When you have leisure time how often do you choose to spend it with any of your ***'close social ties'***?

4. How satisfying is your relationship with your ***'close social ties'***?

5. How often are your ***'close social ties'*** encouraging and supportive to you when you are unhappy?

Study 1 Analyses Including Noneaters

Social support and eating

H1 predicted that a social support prime should elicit psychosocial resources that help people make healthy eating decisions (i.e., eat less high-fat food) compared to people who had not been primed with social support. To test this prediction the analysis excluded participants from the depletion conditions.

An ANOVA revealed no effect of the prime condition (text a friend, text a computer, save a message) on the amount of Doritos that participants consumed, $F(2, 100)= .82$, $p= .44$. Post-hoc comparisons using the Least Square Differences criterion revealed no differences between conditions ($p > .21$). A second ANOVA revealed no main effect of the social support prime on the amount of M&Ms candies consumed, $F(2, 100)= .56$, $p= .57$. Post-hoc comparisons using the Least Square Differences criterion revealed no differences between conditions ($p > .29$). Thus, H1 was not supported with non-eaters included in the data set.

Stress and eating

H2 predicted that stress would increase eating across all priming conditions, such that participants who were stressed would consume more high-fat food than those who were not. Participants who were stressed ate similar amounts of Doritos ($M= 2.72$, $SD= 2.41$) compared to people who were not stressed ($M= 2.74$, $SD= 2.04$), $t(210)= .03$, $p = .98$. Participants who were stressed also consumed similar amounts of M&Ms candies ($M= 3.68$, $SE= .19$) compared to participants who were not stressed ($M= 3.18$, $SD= 2.11$), $t(210)= .44$, $p = .66$. These findings do not support H2.

Stress, social support and eating

H3 predicted that the social support prime of texting a friend would reduce the amount of food consumed when people were stressed from stress, compared to people who texted a computer or saved a message when they were stressed. To test this prediction the analyses included only participants in the depletion conditions. Two ANOVAs were conducted with the social support prime as the predictor and the amount of food consumed (Doritos, M&Ms candies) as dependent variables.

The first ANOVA explored the impact that the social support prime had on the amount of Doritos consumed. Analysis revealed no differences between the social support prime conditions for people who were stressed, $F(2, 106)= 1.03$, $p = .14$. Post-hoc comparisons using the Least Square Differences criterion also revealed no differences between the individual social support prime conditions ($p > .05$). The second ANOVA explored the impact of the social support prime on the amount of M&Ms candies consumed. The analysis revealed no differences between the social support prime conditions for people who were stressed, $F(2, 106)= .26$, $p = .77$, Post-hoc comparisons revealed no differences between the individual social support prime conditions ($p > .47$). H3 was not supported for Doritos or M&Ms candies when non-eaters were included in the data set.

Social Support Contact Questions (Study 2)

For the following questions, consider the person you texted or wrote a message to earlier in the study. Please respond the following items with this person in mind.

1. How friendly is this person? (1 being not at all friendly and 10 being extremely friendly)
2. How willing would you be to turn to this person for help with a problem? (1 being not at all and 10 being absolutely)
3. How satisfying is your relationship with this person? (1, 2, & 3 being "not much," 4, 5, 6, & 7 being "A little," and 8, 9, & 10 being "a Great Deal").
4. How often is this person encouraging or supportive to you when you are unhappy? (1, 2, & 3 being "not much," 4, 5, 6, & 7 being "A little," and 8, 9, & 10 being "a Great Deal").
5. How close are you to this person? (1 being not at all close and 10 very close)
6. How frequently do you interact with the person who wrote this recommendation? (1 very infrequently and 10 very frequently)
7. How well do you know this person? (1 being not at all well and 10 very well)
8. How strong is your relationship with this person? (1 very weak and 10 very strong)
9. How likely would you be to spend time with this person when you want to have fun? (1 being not at all likely and 10 very likely)
10. How likely would you be to spend time with this person when you want to relax? (1 being not at all likely and 10 very likely)
11. How likely would you be to spend time with this person when you want to be distracted from life's stresses? (1 being not at all likely and 10 very likely)
12. How likely would you be to go to a party with this person? (1 being not at all likely and 10 very likely)

Multidimensional Social Support Scale (Study 2)

Please circle the number that best corresponds with each statement. 1 indicates strongly disagree and 5 indicates strongly agree.

1. There is a special person who is around when I am in need.

   1 2 3 4 5

2. There is a special person with whom I can share my joys and sorrows.

   1 2 3 4 5

3. My family really tries to help me.

   1 2 3 4 5

4. I get the emotional help and support I need from my family.

   1 2 3 4 5

5. I have a special person who is a real source of comfort to me.

   1 2 3 4 5

6. My friends really try to help me.

   1 2 3 4 5

7. I can count on my friends when things go wrong.

   1 2 3 4 5

8. I can talk about my problems with my family.

   1 2 3 4 5

9. I have friends with whom I can share my joys and sorrows.

   1 2 3 4 5

10. There is a special person in my life who cares about my feelings.

    1 2 3 4 5

11. My family is willing to help me make decisions.

    1 2 3 4 5

12. I can talk about my problems to my friends.

    1 2 3 4 5

Lexical Decision Task Words (Study 2)

Food Words	Friend Words	Stress Words
snack	social	overwhelm
hungry	support	worry
food	helpful	pressure
dine	buddy	upset
eating	caring	concerned
feed	sharing	stress
dinner	love	frantic
breakfast	friendship	distraught
taste	compassion	tense
supper	listen	terrify
appetite	confide	uncomfortable
lunch	encourage	nervous
snack	companion	uptight

Lexical Decision Task Words (Study 2)

Neutral Words

bathtub	desktop	detergent
plug	shower	basement
chimney	hanger	ottoman
dresser	doorknob	cellar
window	closet	laundry
bookend	blinds	attic
gutter	toilet	lantern
furniture	roof	dryer
shelf	attic	detergent
garage	ottoman	couch
blanket	lamp	washer
heater	faucet	lamp
drawer	couch	bench
lawn	calendar	staircase

Lexical Decision Task Words (Study 2)

Nonwords

dripe	tolay	silby
sarer	porlal	paltern
paner	shont	portrart
plactic	sceve	proler
penril	divect	tived
clork	seanch	alrealy
purpe	boving	culter
earving	tyne	tornid
lorer	parler	forvard
houze	pives	poal
countcy	pirch	sorwy
rairy	cynle	triol
quink	pabed	sorlid
pordon	amenia	yolp
frant	calbous	decint
pailed	doorvay	sowage
lisard	colber	sener
trulh	fronlier	passvord
coirse	recynle	compvter
deciewe	garlage	pocker
phory	camena	grale
backword	curwe	driue
parded	explove	umbrilla
quoid	silbier	yolp
mause	bools	poovly
saivor	rooflop	tover

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