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“I Shall Not Fear”:
Secure Attachment to G-d as a Buffer against Anxiety

by

Peryl Agishtein

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in partial fulfillment of the requirements for the degree of Doctor of Philosophy,
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THE CITY UNIVERSITY OF NEW YORK
Abstract

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Religion has a long and mixed history in the field of psychology. Historically, some leading figures in the field viewed religion as a source of neuroses and poor mental health; others saw a more positive spiritual resource. Recently, empirical data on religion and mental health has proliferated. There is now consensus that religion is associated with lower depression. However, the link between religion and anxiety is less clear-cut. This paper proposes that a) religion can have exacerbating or alleviating effects on anxiety depending on which aspect of religion is being studied and b) the primary religious variable that affects anxiety levels is attachment to G-d. Utilizing the ‘safe haven’ attachment function, people with a secure attachment to G-d seek Him when they are stressed. The anxiolytic benefit of seeking an omnipresent secure attachment figure should lead to lower general levels of anxiety. Hypotheses were explored in a series of three studies. Study One examined which aspects of religion are related to anxiety using correlational self-report methods. Hierarchical multiple regressions supported the hypothesis that attachment to G-d was of primary importance in predicting anxiety levels. In addition, positive and negative aspects of religion were differentially correlated with anxiety, as predicted. The process through which G-d attachment relates to anxiety was experimentally explored in Study
Two. Participants were exposed to a stressful situation (electric shock threat), and their implicit tendency to seek G-d was measured. Results were surprising: explicitly, those with secure G-d attachment reported a greater tendency to seek G-d when stressed, but those with highly avoidant G-d attachment were the only ones to demonstrate an implicit tendency to seek G-d. Study Three further probed this association by measuring the calming effects of a G-d prime. Stress was induced in all participants while anxiety was measured (physiologically and via self-report). ANOVAs demonstrated that securely G-d attached participants primed with religious as opposed to neutral sentences experienced greater reductions in anxiety over time. Overall, this research clarified the different ways in which religion might relate to anxiety and elucidated some exact mechanisms through which religion buffers against anxiety.
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Dedication

I would like to dedicate my dissertation to G-d – Who gives me life, strength, and the insights and inspiration to achieve this work.
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Chapter 1: Introduction

Most religious believers can identify with the sense of comfort that stems from the knowledge of G-d’s presence. But despite anecdotal evidence, psychological research has yet to quantify this effect. Generally, data on the relationship between religion and anxiety has been inconclusive, with some research pointing to lower levels of anxiety in religious people and other studies showing higher anxious pathology in believers. In this paper, I postulate that attachment to G-d is the primary religious construct that accounts for the association between religion and anxiety. I argue that this association is driven by one particular attachment function of the G-d attachment bond, the “safe haven” process, whereby securely attached individuals seek out and are comforted by the presence of an attachment figure.

Attachment theory offers a model through which to understand a person’s relationship with the Divine: people relate to their religion-specific Divine Being as an attachment figure. This implies that a person will use their attachment bond to G-d for the conventional attachment functions, one of which is safe haven. Attachment theory states that when a person feels threatened, he/she will turn to their attachment figure as a safe haven, which will serve to reduce their perception of threat (Bowlby, 1973). The benefits of having an attachment figure who can be counted upon for security actually extend beyond immediate situations of threat; as Bowlby explains, a person who is confident that his attachment figure is available “will be much less prone to either intense or chronic fear (ibid., p. 202).” With human attachment bonds, even the best attachment figures will occasionally be unavailable. With a Divine attachment bond, there is...
no concept of “unavailable;” G-d is uniquely omnipresent, and thus uniquely, perpetually available. A secure attachment to G-d thus includes constant access to a safe haven. Therefore, the reduction in situational or state anxiety offered to securely attached believers by His constant accessibility should be especially notable. Over time, this regular reduction in day-to-day anxiety should lead to lower levels of trait anxiety as well, such that secure G-d attachment may reduce the tendency to perceive situations as threatening and to respond anxiously to daily encounters.

I propose that attachment to G-d is the primary religious variable responsible for variations in anxiety. Of all the religious variables that have been discussed in conjunction with anxiety, I believe that attachment to G-d is the most conceptually linked to anxiety levels. Because of their constant access to an omnipresent safe haven, people who are securely attached to G-d are granted a means of reducing their anxiety in any given threatening situation. Conversely, an insecure attachment to G-d may relate to higher levels of anxiety. Thus, I further postulate that the quality of attachment to G-d, which can be positive (secure) or negative (insecure), may account for past mixed results in studies of religion and anxiety: secure G-d attachment should theoretically be related to lower anxiety, whereas insecure G-d attachment may lead to greater anxiety. In the research proposed here, I begin by presenting the previous literature on religion and anxiety, review some religious variables that might be linked to reduced anxiety, and provide a theoretical proposal of how secure attachment to G-d might buffer against anxiety. Finally, I report a set of three studies designed to evaluate my hypothesis about the function of attachment to G-d in relation to trait anxiety.
Chapter 2: Religion and Psychopathology

Since its beginning as a discipline, psychology has had a tenuous relationship with religion. One of the founding fathers of psychology, Sigmund Freud, famously viewed religion as a source of collective neuroses (Freud, 1930). His view of religion as primarily pathological was echoed by other well-known theorists who followed (e.g., Albert Ellis, 1980; Erich Fromm, 1950). In marked contrast, some of these historical theorists’ contemporaries voiced opposing views of religion as contributing to psychological health (e.g., Erik Erikson, 1958; Carl Jung, 1999). Although there has been discourse about religion over the last century, empirical support for both perspectives was missing, until recent years.

Over the past three decades, a proliferation of research on religion and mental health has at least partially demolished the classic psychoanalytic notion that religion was akin to neuroses. In fact, religion has been linked to an impressive number of positive mental health outcomes, including overall life satisfaction, self-control, feelings of tranquility, appropriate social behavior, freedom from worry and guilt, and a sense of personal competence (Ellison, Burdette, & Hill, 2009; Namini & Murken, 2009; Rounding, Lee, Jacobson, & Ji, 2012; Ventis, 1995).

In terms of more specific psychopathology, most literature investigating the link between religion and psychological disorders has focused on depression and anxiety. There is consensus that religion serves as a protective buffer against depression: a large body of empirical evidence demonstrates a negative association between depression and religion (e.g., Berry & York, 2011; Murphy et al., 2000; Payman & Ryburn, 2010), and results from a recent meta-analysis of 147 independent investigations confirmed that greater religiousness is associated with fewer depressive symptoms (Smith, McCullough, & Poll, 2003). However, literature on the link between religion and anxiety is generally more inconclusive. In addition, due to the nature of
these variables (e.g., the confounding of anxiety with anxious personality), it is also difficult to establish directionality (i.e., does religion impact anxiety level or does anxiety level affect religious tendencies?). That said, most theoretical models that speculate on the underpinnings of this association postulate that religion affects anxiety, rather than vice versa (Ellison et al., 2009).

**Religion and Anxiety**

Many previous studies demonstrate that religion may serve as a protective factor against anxiety. For example, Ellison and colleagues (2009) analyzed data from a nationally representative sample of U.S. adults and found that several aspects of religion (including frequency of religious attendance, belief in an afterlife, and private prayer) were associated with lower anxiety and higher tranquility. This beneficial effect of religion has been seen with several forms of anxiety, including trait anxiety (Kirkpatrick, 2005) and anxiety about death (Soenke, Landau, & Greenberg, 2013).

On the other hand, some papers report either no association or a negative impact of religion on anxiety. Lonczak and colleagues assessed religious upbringing and religious coping (i.e., use of religious support and beliefs as coping mechanisms) and concluded that both aspects of religion were either unrelated to anxiety or predicted higher levels of anxiety (Lonczak, Clifasefi, Marlatt, Blume, & Donovan, 2006). In a college sample, several aspects of religiousness, including religious orientation and faith maturity (i.e., values and behavioral manifestations of faith) were unrelated to subclinical anxiety (Salsman & Carlson, 2005). Further adding to the ambiguity, there is some evidence of an overall positive association between religion and incidence of clinical anxiety (e.g., panic disorder; Trenholm, Trent, & Compton, 1998).
A number of theorists have addressed the inconclusive results on religion and anxiety. In a review of religion and health, Lee and Newberg (2005) cite the numerous difficulties inherent in conducting research on religion and health, all of which could contribute to mixed results. Some of the issues they list include the lack of a universal definition of religion/spirituality and the presence of “positive externalities” such as social support and physical activities that often covary with religion and thus confound results. Ventis (1995) and Ellison and colleagues (2009) postulate that inconsistent findings result from the fact that researchers studying religion and anxiety have used a wide variety of different constructs to represent “religion,” rather than coming to a consensus about a universal operationalization of religion.

A more nuanced view of the data is to surmise that religion can have both favorable and unfavorable effects on anxiety, depending on a number of situational and individual factors. Jones, Francis, and Jackson (2004) offer an example of this when they conclude that religion can sometimes buffer against anxiety but in other instances exacerbate it, after finding that Anglican male clergy were higher on anxiety than non-clergymen but Anglican female clergy were lower on anxiety than non-clergywomen. Pargament (2002) draws the same conclusion in a paper evaluating the “costs and benefits” of religiousness. He explains that psychologists’ view of religion as either good or bad is inaccurate. Rather, religion must be understood as a complex entity that is implicated in both positive and negative mental health outcomes. According to this view, the mental health outcome of religious beliefs is dependent on the particular religious denomination as well as on the idiosyncratic way in which individuals interpret and apply their religion. For instance, positive religious coping\(^1\) methods, trust in G-d, and belief in an afterlife

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\(^1\) Note that positive and negative religious coping, used in this context and throughout this paper, refers merely to the positive and negative religious coping techniques elucidated by Pargament, Koenig, & Perez, 2000. Use of these terms is not meant as judgment of which religious coping
are associated with better mental health, while negative religious coping, hatred of G-d, and belief in the sinfulness of humans are linked to psychopathology (ibid.). Notably, this discussion hearkens back to the ideas of the founding father of the study of psychology and religion, William James. In his classic book on religion, James famously describes and contrasts the “religion of healthy-mindedness” and of the “sick soul,” proposing that religion can support either mental health or mental illness (1902). Overall, the theme that emerges from these discussions is that religion is a complex, multi-dimensional construct that includes both positive and negative aspects, and thus can confer both benefits and disadvantages for devotees, depending on which aspects of religion they endorse. This more nuanced view of the association between religion and anxiety may account for the inconclusive empirical results on the topic (e.g., Kirpatrick, 2005 versus Trenholm, et al., 1998; see above).

Techniques are acceptable, as different religions may encourage use of different religious coping methods. Rather, Pargament and colleagues use the terms to indicate methods of religious coping that are associated with better or worse mental health outcomes.
Chapter 3: Which Religious Variables and Covariates Might Reduce Anxiety?

Notwithstanding the potential negative effects of religion, it is clear that at least several aspects of religion are, in fact, associated with lower anxiety. However, two related questions remain unanswered. First, due to lack of consensus on the best way to operationalize religion, studies that measure the relationship between religion and anxiety have used diverse religious constructs. For example, as a proxy for “religion,” researchers have measured constructs as varied as religious orientation, beliefs, practices, and coping styles. Because of these inconsistencies, it remains unclear exactly which religious constructs either reduce or exacerbate anxiety. Second, it is also unclear what underlying, non-religious constructs might account for the relationship between religion and lower anxiety. A number of studies have attempted to partially answer these two questions, and a range of possible religious variables and mediators have emerged.

Religious Variables Related to Lower Anxiety

Religion as a construct is too complex to fully parse into its different aspects, especially when accounting for the wide range of world religions (Lee & Newberg, 2005). However, it is possible to identify a number of variables that exist in most religions and that are potentially related to mental health outcomes. This list includes a) motivation and commitment to one’s religion, or intrinsic/extrinsic orientation; b) religious beliefs (e.g., belief in an afterlife); c) features of one’s relationship with G-d (e.g., trust or mistrust in G-d); d) positive or negative use of religion to cope with life stressors; and e) organized and non-organized religious behaviors (e.g., involvement in congregational life) (Berry & York, 2011; Ellison et al., 2009; Lee & Newberg, 2005). I discuss each of these factors below.
One’s religion may be intrinsically, innately valued (i.e., *intrinsic religious orientation*) or it may be utilized as an avenue towards extrinsic gain, such as social conformity (i.e., *extrinsic orientation*) (Allport & Ross, 1967). The value that an individual places on religion, or one’s *religious orientation*, is one promising candidate for a variable that impacts anxiety. Specifically, there is considerable support for an association between intrinsic religiosity and better mental health, including lower levels of anxiety, worry, guilt, paranoia, hostility, and depression (Baker & Gorsuch, 1982; Lesniak, Rudman, Rector, & Elkin, 2006; Payman & Ryburn, 2010; Salsman & Carlson, 2005; Ventis, 1995). Conversely, extrinsic religiosity is generally associated with negative mental health outcomes, including higher rates of anxious and depressive symptomatology (Agishtein, et al., 2013; Baker & Gorsuch, 1982; Smith et al., 2003).

Religious doctrine and *beliefs*, which vary widely both between religious denominations and between individuals within denominations, also have a sizable impact on anxiety and other mental health outcomes. Belief in an afterlife, and the sense of immortality typically offered by religion, is thought to alleviate anxiety about death as well as general anxiety (Soenke et al., 2013). For example, Krause and colleagues (2002) interviewed older Japanese adults who had experienced the death of a loved one and found that belief in a positive afterlife buffered the effect of this stressor on hypertension levels. Beliefs about the nature of G-d and sin also impact anxiety. From a Gallup poll, Silton and colleagues concluded that belief in a punitive G-d correlated positively with social anxiety, paranoia, obsession, and compulsion, while belief in a benevolent G-d correlated negatively with these four symptoms (Silton, Flannelly, Galek, & Ellison, 2013). Belief in the sinfulness of human nature and in the potential to commit unforgivable sins has been associated with suicidality and mistrust of others (Exline, Yali, & Sanderson, 2000; Hempel, Matthews, & Bartkowski, 2012; Wesselmann & Graziano, 2010).
Other doctrinal beliefs that have been linked to greater anxiety include belief in a G-d who expects perfection, as well as inflexible and narrow religious beliefs (Dein, 2013).

One’s relationship with G-d, or the way in which a person perceives and interacts with a divine being, significantly affects mental health as well. Based on Christian doctrine, bolstering trust in G-d should alleviate anxiety (Kilmer, 2002); from a clinical perspective, spiritually-integrated anxiety treatments for devout Christians include a re-formulation of one’s relationship with G-d (Dein, 2013). This theme of trust in G-d as having the power to reduce anxiety is evident in other religions as well. Research generally supports these ideas. For instance, Rosmarin, Pargament, and Mahoney (2009) surveyed a large Jewish community sample and found that trust in G-d was negatively correlated with anxiety and depression. Several other emotional aspects of one’s relationship with G-d have been found to be associated with psychological well-being. Braam and colleagues investigated the G-d relationship and psychological functioning in a sample of older Dutch adults and concluded that feelings of discontent and anxiety directed at G-d correlated with neuroticism, while a perception of G-d as supportive was associated with agreeableness (Braam, Mooi, Jonker, van Tilburg, & Deeg, 2008).

Religious coping is another variable that has been widely implicated in mental health outcomes. Religious coping refers to the use of religion to cope with stressful events. Because of the multi-dimensional character of religion, diverse methods of religious coping exist, including both positive, beneficial coping techniques (e.g., seeking spiritual support; religious forgiving) and negative, ineffective coping techniques (e.g., deciding that one is being punished; ‘giving up’ due to religious beliefs) (see Pargament, Koenig, & Perez, 2000). Generally speaking, use of positive religious coping techniques are associated with favorable mental health outcomes,
including lower anxiety, while negative religious coping has been linked to reduced mental health (Carleton, Esparza, Thaxter, & Grant, 2008; Lonczak et al., 2006; Pirutinsky, Rosmarin, Pargament, & Midlarsky, 2011).

Finally, indices of religious *behavioral manifestations* are among the most commonly used constructs in studies of religion and health (Lee & Newberg, 2005). Religious practices, including frequency of prayer, frequency of attendance at religious services, and frequency of religious reading, are associated with lower anxiety and depression among both Christian and Jewish populations (Agishtein et al., 2013; Rosmarin, Pirutinsky, Pargament, & Krumrei, 2009). Prayer in particular, as an activity that fosters a deeper relationship with G-d and a “sharing of one’s burden” with Him, has been implicated in lower anxiety and depression, as well as a range of positive mental health outcomes, including feelings of self-worth, optimism and hope, and emotional and psychological reserves (Boelens, Reeves, Replogle, & Koenig, 2012; Cadge & Daglian, 2008; Krause, 2004).

**Mediators of the Association between Religion and Anxiety**

The second question of what might account for religion’s association with lower anxiety is highly complex, as it must address the large number of possible mediators that could explain the association between religious variables and lower anxiety. Lee and Newberg (2005) note that the presence of numerous “positive externalities,” or non-religious benefits that are provided by religious membership, makes it difficult to fully understand the relationship between religion and health. However, a review of the literature reveals several positive externalities that may be potential mediators of this association.

Social factors such as social support and societal attitudes towards religion consistently emerge as mediators of the relationship between religion and anxiety. High levels of social
support are a benefit of membership in many religious groups. Religious institutions often provide opportunities for friendship and supportive exchanges (Greenlee & Lantz, 1993; Krause 2002), as well as formal congregational-based support mechanisms (Neighbors, Musick, & Williams, 1998). Social support is linked to well-being benefits such as reduced anxiety and distress (Graham & Roemer, 2012; Hasson-Ohayon, Goldzweig, Braun, & Galinsky, 2010; Wasteson, Nordin, Hoffman, Glimelius, & Sjoden, 2002), which suggests that high levels of religious social support might sometimes result in the mental health benefits of religion. Indeed, studies have found that social support mediates the effect of religion on lower anxiety and depression (Jang & Johnson, 2004; Pirutinsky et al., 2011a). Another social factor that mediates religion’s effect on anxiety is the degree to which one’s culture values religion. Several papers have found that religion’s societal value moderates the link between religiosity and certain psychological benefits, such that religion confers greater mental health on an individual to the extent that religion is valued by the individual’s culture (Friedman & Saroglou, 2010; Gebauer, Sedikides, & Neberich, 2012).

Another positive, non-religious benefit of religion is increased pleasurable activities. Commitment to a religion and participation in a congregation often involves structured activities and behaviors, including church-organized activities as well as religious practices (Powell, Shahabi, & Thoresen, 2003). Behavioral activation therapy is a well-established treatment for anxiety and depression that centers on the scheduling of healthy and pleasant activities (Kanter, Manos, Bowe, Baruch, Busch, & Rusch, 2010; MacPhillamy & Lewinson, 1974; Turner & Leach, 2010). The efficacy of behavioral activation therapy supports the idea that increased frequency of positive behaviors often linked with religious participation may account for a
reduction in anxiety. In addition, church and religious activities may offer exercise, reprieve from unhealthy environments and daily stress, and time for reflection (Lee & Newberg, 2005).

Religion is associated with a number of other positive externalities that are theoretically and empirically related to greater mental health, including lower rates of anxiety. For example, in a series of four experiments, Rounding, Lee, Jacobson, and Ji (2012) demonstrated that religion replenishes people’s ability to exercise self-control, which is considered one of the foundations of psychological health. Spirituality levels have also been found to positively relate to meaning in life, self-esteem, and positive affect (Kashdan & Nezlek, 2012). In a qualitative observational study of how rural Appalachian families cope with poverty, Greenlee and Lantz (1993) noted that many families benefited from access to resources such as mechanical expertise, free insurance, and other subsidized or free services provided by co-congregants. Similarly, Lee and Newberg (2005) cite the possibility of meeting physicians and other health-care workers as a positive externality available through religion. Finally, another benefit of religion is a decreased likelihood of risk-related behaviors such as multiple sexual partners and alcohol or substance abuse (Marsiglia, Ayers, & Hoffman, 2012; McCree, Wingood, DiClemente, Davies, & Harrington, 2003; Stewart, 2001). Through religious doctrines and religious peer pressure, religiosity might protect against these risk behaviors, which are generally associated with poor physical and mental health (Lee & Newberg, 2005; Mason, Schmidt, & Mennis, 2012).
Chapter 4: Attachment to G-d and Anxiety: Why Should There Be an Association?

A review of the literature demonstrates that at least some aspects of religion are associated with reduced anxiety, and that a wide range of factors have been implicated in this association. However, it is unclear which religious variables primarily account for the association. It is also not known what mediators underlie the link between religion and anxiety, and what processes might drive the association. Based on theory and previous findings, I propose that secure attachment to G-d is one of the main religious constructs buffering against anxiety. I postulate that this association operates through the constant access to an attachment figure that is offered by a secure attachment bond with G-d. Since some religious individuals are securely attached to G-d and others are insecurely attached, this may also partially account for the mixed findings on the association between religion and anxiety. It is likely that individuals who have a secure attachment bond to G-d are high on other religiosity measures and low on anxiety, while those who are high on some religiosity measures but have insecure attachment to G-d do not derive an anxiety-reducing benefit. Next, I give an overview of attachment theory in general, and then discuss attachment theory as it relates to religious life specifically.

Attachment Theory: A Brief Overview

Attachment theory was developed by John Bowlby (1969) to account for the close bonds between children and their caregivers. Bowlby proposed a biologically-based attachment system, a behavioral system that facilitates the formation of a bond between infants and their caregivers, or attachment figures. The primary functions of this bond are to maintain proximity to the attachment figure (thereby protecting infants from danger), to allow the infant to explore his environment while maintaining the “secure base” of the attachment figure, and to provide the
infant with the “safe haven” of the attachment figure when the infant feels threatened (Feeney & Noller, 1996).

Attachment functioning depends largely on a person’s past relational experiences, particularly on the behavior of a primary caregiver during the development of an infant’s social awareness. The social experiences of infants contribute to the formation of internal working models, or cognitive representations of the attachment figure(s) and the self (Ainsworth, Blehar, Water, & Wall, 1978; Bowlby, 1969). These representational models dictate which attachment strategies to employ in various social situations. They also serve as the basis for dispositional variations in relationship behaviors. Mary Ainsworth (1967) first observed infants’ variations in relating to attachment figures and termed these differences “attachment styles.” Bowlby (1973) later named three specific styles: secure, avoidant, and anxious-ambivalent.

Over the years, attachment theorists have conceptualized attachment styles in different ways. One of today’s primary conceptualizations identifies two core attachment dimensions, avoidance and anxiety (Brennan, Clark, & Shaver, 1998). Avoidance reflects one’s level of comfort with relational closeness. Individuals high in attachment avoidance tend to feel uncomfortable with interpersonal intimacy and employ deactivating emotional and cognitive strategies, suppressing their feelings in attachment-relevant situations. Attachment anxiety characterizes one’s degree of worry about the availability of others. Highly anxious individuals are very dependent on close others, and utilize hyperactivating strategies such as the tendency to perceive threat in attachment-relevant situations. People scoring low on both dimensions are considered secure. Greater attachment security is associated with a range of benefits, including more satisfying romantic relationships and better mental health, self-esteem, and coping

Bowlby concentrated mainly on the infant-caregiver attachment bond but also asserted that humans maintain attachment bonds “from the cradle to the grave” (Bowlby, 1979, p. 129). Attachment figures in adulthood serve the same three functions of the attachment system (i.e., protection, secure base, and safe haven), and can include romantic partners, close friends, parents, and siblings (Feeney & Noller, 1996). The existence of adult attachment was empirically demonstrated in 1987, when Hazan and Shaver successfully explained romantic relationships from the perspective of attachment theory. Hazan and Shaver’s seminal article set off a surge of research and new ideas on the functioning of the attachment system in adulthood.

*Attachment to G-d*

Attachment bonds are not limited to bonds between humans: for example, attachments to material objects and to pets have also been documented (Beck & Madresh, 2008; Keefer, Landau, Rothschild, & Sullivan, 2012; Zilcha-Mano, Mikulincer, & Shaver, 2011). In the context of attachment theory, the first non-human attachment bond proposed was that of an attachment to G-d.

The idea of G-d as a source of security for believers is nothing new; as a theologian familiar with attachment theory concluded, “the idea of G-d is the idea of an absolutely adequate attachment figure…G-d is thought of as a protective parent who is always reliable and always available to its children when they are in need” (Kaufman, 1981, p. 67; cited by Kirkpatrick & Shaver, 1990). Lee Kirkpatrick was the first attachment theorist to clearly conceptualize the relationship with G-d as an attachment bond. In a series of papers (Kirkpatrick & Shaver, 1990,
1992; Kirkpatrick, 2005), Kirkpatrick and colleagues delineated the ways in which G-d functions as an attachment figure, and backed these ideas with empirical research support.

Empirical and anecdotal evidence drawn from a multitude of disciplines demonstrates that G-d meets five criteria of attachment relationships: people seek proximity to G-d, experience G-d as a safe haven in times of stress, experience G-d as a secure base from which to explore, experience anxiety at the threat of separation from G-d, and would feel grief at the loss of their relationship with G-d (Kirkpatrick, 2005). Notably, attachment to G-d can be characterized as secure versus insecure, just as general childhood and adult attachment is described. Specifically, Rowat and Kirkpatrick (2002) found that attachment to G-d mapped onto the two dimensions of avoidance and anxiety that characterize adult attachment. In the same paper, the authors demonstrated that attachment to G-d is a distinct construct, and is separate from other religious constructs (e.g., religious belief and motivation) and from general adult attachment style.

*How do other Attachments Relate to G-d Attachment?* Early empirical research on how G-d attachment relates to other attachment relationships yielded varied results. One body of work seemed to indicate that G-d primarily functions as a “substitute” attachment figure; that is, those who have experienced insecure attachment to their parents or romantic partners tend to demonstrate a close and secure relationship with G-d (e.g., Granqvist & Hagekull, 2003; Kirkpatrick, 1990; Kirkpatrick, 1997). In contrast, another body of work supported the idea that attachment to G-d mirrors the attachment dynamics of people’s other close relationships (e.g., Birgegard & Granqvist, 2004; Granqvist & Hagekull, 1999; Kirkpatrick & Shaver, 1992). These seemingly contradictory findings parallel two opposing hypotheses that can be derived from attachment theory: the compensation hypothesis and the correspondence hypothesis (Granqvist & Kirkpatrick, 2008). The compensation hypothesis anticipates that people who are lacking
secure attachment bonds to other humans will become securely attached to G-d as a substitute attachment figure, particularly after periods of life stress. The correspondence hypothesis postulates that the internal working models of “self” and “other” formed in childhood, which are thought to serve as the foundation of a general attachment style, direct the attachment bond to G-d. Accordingly, individuals who are secure in general are predicted to have a secure attachment bond with G-d. As noted, empirical evidence supports both of these hypotheses; other factors, such as periods of stress in a person’s life and the religiosity of one’s childhood attachment figures, predict which process will apply on an individual level (ibid.).
Chapter 5: Attachment Relationships and Lower Anxiety

Anxiolytic Benefits of Attachment

One of the most salient benefits of an attachment relationship is the reduction in fear and anxiety that results from the provision of a “safe haven.” In the classic attachment scenario, an infant who feels scared or threatened will seek out his or her mother as a safe haven, thus deriving comfort and security from the presence of the attachment figure. This benefit is not limited to stressful situations; as Bowlby stated, “When an individual is confident that an attachment figure will be available to him whenever he desires it, that person will be much less prone to either intense or chronic fear than will an individual who for any reason has no such confidence” (Bowlby, 1973, p. 202). Perceiving an attachment figure as available (whether through physical proximity or mental access) protects against the experience of anxiety, both in specific situations and in general.

Anxiety Reduction in Specific Situations. A number of research studies employing a wide range of experimental techniques have demonstrated that securely-attached individuals tend to turn to their attachment figure when they experience distress, which then reduces their anxiety. As Bowlby originally theorized, the attachment system is most strongly activated in threatening situations, and access to an attachment figure serves to reduce the perception of threat (1973, 1979). This effect was well-documented in children in the early attachment literature (Ainsworth et al., 1978). Research on safe haven functioning in adult attachment bonds is more limited, and the safe haven-seeking behavior of insecurely attached adults is less well-established, but a review of the literature reveals people’s general tendency to turn to attachment figures in stressful situations and derive anxiety-reduction benefits from attachment figure access (e.g., Coan, Schaefer, & Davidson, 2006).
One way of measuring whether adults turn to their attachment figures when they feel distressed is by assessing how they cope with life stressors. Regardless of attachment style, people report seeking support from partners and family as one of the most commonly used coping techniques for dealing with both specific and chronic stressors (Holmberg, Lomore, Takacs, & Price, 2011; Karantzas and Cole, 2011). That said, there is evidence of a tendency for avoidantly attached people to seek less social support than securely or anxiously attached people, indicating that avoidant people utilize the safe haven function of the attachment bond less often, or to a lesser extent, than other individuals. To illustrate this effect, Simpson, Rholes, and Nelligan (1992) induced stress in partnered females and then analyzed each couple’s interaction. As one might expect, securely attached women who felt distressed sought support from their partners, but avoidantly attached women reacted in the opposite way, such that the more stress the woman felt, the less likely she was to seek support from her partner. Anxious attachment was unrelated to the degree of support-seeking. However, this effect may be attenuated by sex: Simpson, Rholes, Orina, and Grich (2002) replicated this experiment while inducing stress in the male partner and found that, although many men sought support from their attachment figure, attachment orientation was not associated with the degree of men’s support seeking. The effect of avoidant attachment on support-seeking may also be attenuated by relationship quality: Slotter and Luchies (2013) found that although avoidant individuals in distressful situations generally desired less closeness to their partners than unavoidant people, avoidant individuals who were in a subjectively “high quality” relationship did desire closeness to their partner when feeling emotionally distressed.

Another key question is whether turning to an attachment figure in stressful situations alleviates distress and anxiety. Data indicate that seeking a safe haven reduces anxiety in
securely attached people, but this association is less clear in the case of insecurely attached people. In an investigation of how married subjects with chronic pain reacted to receiving support from their partner, high attachment anxiety (but not avoidance) was associated with more negative responses (Forsythe, Romano, Jensen, & Thorn, 2012). Returning to the previously discussed study, Simpson and colleagues (1992) found that when males gave support to their female partners who had been made to feel anxious, all women tended to feel calmer, but unexpectedly, supportive comments had the greatest calming effect on avoidant women. Anxious attachment was unrelated to the level of stress relief. In an analogous paradigm, Meuwly and colleagues (2012) induced stress in participants through a public speaking task, then videotaped their partner interactions and measured their cortisol levels. All participants sought support from their partner, regardless of attachment orientation, but this support was least helpful for anxiously attached individuals: anxious attachment was associated with slower cortisol recovery rate than secure attachment, while avoidant attachment was unrelated to the stress recovery response. Ditzen and colleagues (2008) measured whether receiving support from a partner predicted decreases in self-reported state anxiety following a stress induction, and found that securely attached individuals who received support from their partner exhibited the lowest anxiety levels. In sum, while secure individuals tend to benefit most from supportive partners, some data indicate that avoidant individuals also derive significant anxiolytic benefits from social support while anxious individuals benefit the least.

Importantly, the tendency to seek out support from a partner, as well as the calming effects of seeking support, is not limited to those instances where the partner is physically available. A “cognitive safe haven” exists as well, whereby threatened individuals will bring to mind mental representations of attachment figures and feel comforted (Selcuk, Zayas, Gunaydin,
For instance, McGowan (2002) induced stress in subjects, then asked them to describe either their significant other or an acquaintance. Thinking about their attachment figure, or significant other, led to lower distress scores for securely attached individuals, supporting the cognitive safe haven effect. Selcuk and colleagues (2012) asked subjects to recall an upsetting autobiographical memory and then primed them with the mental representation of their attachment figure. Activating the representation reduced distress as indicated by both explicit and implicit measures of negative affect. This effect held true for all participants, but was weakest for those high on attachment avoidance. The cognitive safe haven effect has also been found to reduce even physical pain. Eisenberger and colleagues (2011) had subjects view pictures of either their partner or a neutral object while receiving painful heat stimuli. Viewing pictures of a partner reduced self-reported pain as well as pain-related neural activity.

Secure Attachment Style and Lower General Anxiety. Since secure attachment serves as a buffer against regular life stressors and reduces acute anxiety in threatening circumstances, over time, this should lead to generally lower dispositional anxiety (Kemp & Neimeyer, 1999). Indeed, this conclusion is borne out by data: numerous studies of attachment and psychopathology have found that secure attachment is associated with lower levels of overall anxiety. This includes many variations of anxiety, including clinical anxiety disorders, general trait anxiety, perceived stress, levels of worry, and anxiety-related personality constructs such as neuroticism.

Much of the research in the area of attachment and mental health directly examines how attachment behaviors relate to clinical disorders. In a community sample of 60 women, Ward, Lee, and Polan (2006) demonstrated much higher rates of DSM-IV clinical diagnoses among the
insecure women. Avoidant attachment was more strongly associated with Axis II personality disorders (e.g., histrionic or narcissistic personalities), but anxious attachment was more strongly associated with Axis I affective disorders, including anxiety. Muller, Lemieux, and Sicoli (2001) obtained similar results in another community sample, where they demonstrated that attachment anxiety was associated with higher levels of general anxiety disorder. After a review of the literature, Shorey and Snyder (2006) concluded that compared to securely attached people, both avoidantly and anxiously attached individuals experience a greater incidence of clinical disorders, including general anxiety, phobias, panic, post-traumatic stress disorder, and obsessive-compulsive disorder.

Other papers have examined more general psychological functioning in insecurely attached individuals. Fortuna and Roisman (2008) administered two different measures of attachment in a college sample, and found that internalizing psychopathology was positively associated with hyperactivating attachment strategies (i.e., anxious attachment) on the Adult Attachment Interview and was associated with both attachment anxiety and avoidance as measured by the Relationship Scales Questionnaire. In a study of former prisoners-of-war (Solomon, Ginzburg, Mikulincer, Neria, & Ohry, 1998), both avoidantly and anxiously attached veterans reported more severe psychiatric symptomatology, including anxiety, compared to secure veterans.

Attachment insecurity also correlates with non-clinical anxiety-related constructs, such as neuroticism and subjective stress and worry. Noftle and Shaver (2006) examined attachment style in conjunction with the “Big Five” personality constructs, and found that insecure attachment, particularly attachment anxiety, was associated with neuroticism. McCarthy, Moller, and Fouladi (2001) found that college students who were securely attached had lower levels of
perceived stress than college students who were insecurely attached. In a review of this literature, Maunder and Hunter (2001) concluded that insecurely attached individuals tend to perceive events as more stressful and experience prolonged and more intense physiological stress responses.

Most studies have found the association between insecure attachment and general dispositional anxiety for both anxious and avoidant attachment styles, but there is some evidence that this relationship is stronger for anxious attachment than for avoidant attachment. For instance, Koopman and colleagues (2000) reported that perceived stress levels were positively correlated with anxious attachment styles, but not with avoidant attachment styles. Similarly, Pielage, Gerlsma, and Schaap (2000) found that anxious, but not avoidant, attachment predisposed people to interpret events as stressful, which led to increased anxious psychopathology.

The Relationship between Attachment to G-d and Anxiety

Extrapolating from the data on attachment orientation and anxiety, it can be logically assumed that people who are securely attached to G-d will experience similar benefits of reduced anxiety (Kirkpatrick, 2005). In fact, based on the omnipresent characteristic of the Judeo-Christian monotheistic conceptualization of G-d\(^2\), it is reasonable that a secure attachment to G-d should have strong anxiety-buffering benefits. Unlike the majority of attachment figures, G-d is perceived by a person who is securely attached to Him as constantly present and constantly available. Since “availability of a secure base is the antidote to fear and anxiety” (Kirkpatrick, \(\ldots\)

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\(^2\) Given cross-religion differences in the perceived immediacy of G-d, gods, or other divine figures, it is unclear whether adherents of other religions will derive the same anxiolytic benefit of secure attachment. This is one question that will be assessed in the current study by including a diversity of religious denominations.
2005, p. 65), this implies that those who are securely attached to G-d have access to an “anxiety antidote” in any stressful situation. Over time, the accumulated experience of anxiety reduction in specific stressful situations should lead to lower general anxiety as well.

There is a growing body of evidence supporting the idea that secure attachment to G-d is associated with lower anxiety. In the first study directly measuring attachment to G-d, Kirkpatrick and Shaver (1992) found that individuals with a secure attachment to G-d reported lower levels of anxiety. Similarly, in their original paper presenting the anxious and avoidant dimensions of G-d attachment, Rowat and Kirkpatrick (2002) also measured a range of psychopathology and personality measures. They found that G-d attachment anxiety was positively correlated with manifest anxiety and negative affect, while both G-d anxiety and G-d avoidance were positively correlated with neuroticism. Namini and Murken (2009) examined attachment to G-d and psychopathology in a religious German adult sample, and found a positive correlation between secure attachment to G-d and life satisfaction, and a negative correlation between security with G-d and levels of anxiety and depression. In an Australian adult sample, Miner (2009) concluded that security of G-d attachment was associated with decreased trait anxiety and increased existential well-being. Importantly, Miner found that these effects were additive to the effects of adult attachment orientation, and had incremental validity over adult attachment in predicting anxiety and well-being. Reiner, Anderson, Hall, and Hall (2010) measured perceived stress, attachment to G-d, and general adult attachment orientation. Both dimensions of insecure adult attachment were significantly correlated with levels of perceived stress, while for G-d attachment, only attachment anxiety predicted higher levels of perceived stress. Again, G-d attachment anxiety exhibited incremental validity over general attachment style in predicting perceived stress. In a more immediate measure of use of G-d as a safe haven,
Belavich and Pargament (2002) administered a series of questionnaires to subjects as they waited for their loved one who was undergoing surgery. Results indicated that secure attachment to G-d was positively correlated with use of spiritual coping techniques, suggesting that these subjects turned to G-d in a stressful situation. In contrast, avoidant attachment to G-d was negatively correlated with use of spiritual coping, while anxious attachment to G-d was unrelated to spiritual coping. In addition, secure attachment to G-d predicted more positive general adjustment to the stressful situation; this association was mediated by the use of positive spiritual coping.

Use of the G-d attachment bond to relieve anxiety is also supported by experimental research. In one of the few experimental papers on this topic, Birgegard and Granqvist (2004) found a modest increase in motivation to be close to G-d among believers who had been primed with separation threats. More recently, Granqvist and colleagues (2012) ran a series of studies to test whether people turn to G-d as a safe haven. All participants, who were initially screened for belief in G-d, reacted more quickly to G-d related words than to neutral words after being primed with distress signals. There was no difference in reaction time to the words after being primed with neutral signals.
Chapter 6: The Current Study

Previous literature has established a strong association between religion and better mental health. There is evidence that religion is associated with lower anxiety and stress, although the association between religion and stress is less conclusive. Attachment to G-d is one probable candidate accounting for the relationship between religion and lower anxiety: secure attachment correlates with lower anxiety, and there is some evidence that attachment to G-d in particular also relates to lower anxiety. However, the possibility that attachment to G-d is the prime religious construct responsible for lower anxiety, as well as the mechanisms that might drive this association, have never been fully explored.

Study 1 lays the preliminary groundwork for support of my idea that G-d attachment is the primary religious variable affecting anxiety levels. The goal in Study 1 is to determine whether attachment to G-d is most strongly related to variations in anxiety by examining a number of religious constructs in conjunction with several measures of anxiety/stress. Study 2 is designed to establish the mechanism behind this process by manipulating stress levels and then examining whether participants who are securely attached to G-d turn to G-d in stressful situations. This pattern would suggest that the process through which attachment to G-d leads to lower anxiety relates to the “haven of safety” function of the omnipresent attachment bond. Study 3 more fully explores this possibility by measuring physiological and subjective anxiety as stressed individuals are primed with the concept of G-d. Confirmation of the Study 3 hypothesis, that invoking G-d does indeed lower state anxiety in individuals who are securely attached to G-d, would serve as further evidence to support my theory of how attachment to G-d accounts for lower general anxiety and stress.
In sum, I propose that secure attachment to G-d is the primary religious variable accounting for lower general anxiety/stress, based on the omnipresent “safe haven” function offered by a secure attachment to G-d. I explore this idea in a series of three studies that will establish whether this association exists, and identify the mechanisms accounting for it. This research extends previous literature in several important ways. First, studies of anxiety and religion have yielded inconclusive results, partly due to the different aspects of religion and anxiety being measured. By including a theory-based list of religious constructs as well as different aspects of anxiety, I hope to further clarify the relationship between (specific aspects of) religion and anxiety and provide a theoretically coherent account of the association. Importantly, by experimentally observing differences in anxiety as a function of religion-related priming, I will also be able to assess directionality in the link between anxiety and religion. Second, studies 2 and 3 enable immediate and concrete observations of the real-time mechanisms of G-d attachment by measuring immediate stress response and response to a G-d prime as a function of attachment to G-d. This has never been done before, to my knowledge. Finally, I am extending previous research on religion, anxiety, and G-d attachment from primarily Christian populations to a host of religions by conducting my research at Queens College, one of the most diverse colleges in the United States (Franek, Meltzer, & Maier, 2008). This will provide a more varied religious sample and thus greater external validity.

Throughout the sections below, unless otherwise specified, “anxiety” refers to general, affective anxiety (rather than attachment anxiety); “attachment” refers to attachment to G-d

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3 Based on a previous study I conducted at the same college (Agishtein & Brumbaugh, 2013), I can expect a wider range of religious diversity than that reported in most studies. The religious breakdown in my previous study was as follows: 43% Christian, 17% Jewish, 8% Muslim, 11% Hindu/Buddhist, and 16% non-religious.
(rather than general attachment); and “psychopathology” is used when I am referring to all the Study 1 outcome measures (which included depression and neuroticism in addition to general anxiety and stress).

**Hypotheses**

**Study 1 Hypotheses.** In Study 1, the primary research question addresses how G-d attachment variations relate to anxiety and stress. Few papers have assessed attachment to G-d and anxiety, and the limited research on the topic indicates that secure attachment to G-d is associated with lower anxiety (e.g., Namini & Murken, 2009; Miner, 2009). **H1:** Since I theorize that the secure attachment bond to G-d should theoretically be strongly linked to lower state and trait anxiety, my first prediction is that higher rates of secure attachment to G-d will account for lower levels on the anxiety measures over and above the variance that is accounted for by other religious variables. **H2:** Based on previous literature assessing attachment styles (both general and G-d attachment) and anxiety (e.g., Fortuna & Roisman, 2008), I predict that anxious attachment to G-d will be positively associated with the anxiety measures. **H3:** Because some papers have found no association between attachment avoidance and general anxiety (e.g., Ward et al., 2006), I predict that individuals with high G-d attachment avoidance will have higher rates of anxiety/stress than those with secure G-d attachment, but lower rates of anxiety than those with high G-d attachment anxiety. **H4:** Although I expect to find the same general direction of correlations for G-d attachment style and all of the anxiety measures, I hypothesize that these associations will be most evident when predicting manifest anxiety and trait anxiety, since these constructs are theoretically the most closely linked to the G-d attachment bond function of secure haven. **H5:** I predict that in addition to insecure G-d attachment, other more negative aspects of religion (e.g., negative religious coping, negative religious support, mistrust in G-d, and sin
belief) will be positively correlated with anxiety and stress (as per past research; e.g., Chapman & Steger, 2010; Johnson et al., 2011). Conversely, I expect that positive aspects of religion will negatively correlate with anxiety.

**Non-Religious Moderators.** One group of covariates that must be addressed in Study 1 is the “positive externalities” described by Lee and Newberg (2005): non-religious benefits provided by religious membership. Significantly, two specific positive externalities have been separately linked to lower anxiety. Social support and integration are often side benefits of religious membership (Krause, 2002), and numerous papers implicate high social support in reducing anxiety (e.g., Wasteson et al., 2002). Another benefit that often co-varies with religious activity is increased involvement in physical and pleasurable activity in general (Powell et al., 2003). Physical activity is associated with lower stress, both as a source of exercise and as a behavioral activation treatment (e.g., Turner & Leach, 2010; Vancampfort et al., 2011). Therefore, it is important to assess and control for both social support and physical activity when examining which religious variables are associated with anxiety levels.

There are several other variables that may moderate the association between G-d attachment and anxiety. One variable that may influence the results is the presence of recent stressful events. I expect to find that G-d attachment security buffers against general anxiety levels, but this effect is likely to be attenuated if a subject has been experiencing a great deal of recent stress. Therefore, recent stressful events will be assessed and controlled. In addition, while I expect that secure G-d attachment is related to lower trait anxiety, this theoretical association is based on the recurring reductions in state anxiety that lead to lower trait anxiety over time. Thus, if a participant recently experienced significant religious changes that affected their relationship with G-d, there would have been less time for these recurring state anxiety reductions to lower...
trait anxiety, and I can expect to see a weaker effect. Recent changes in religion will therefore be controlled for as well. A final important variable is general adult attachment style: since secure adult attachment style is related to lower anxiety (e.g., Ward et al., 2006) and it is unclear how adult attachment style relates to G-d attachment style, it is critical to control for adult attachment style when assessing the effects of G-d attachment security.

**Study 2 Hypotheses.** Study 2 builds on Study 1 by exploring whether secure G-d attachment predicts G-d seeking behaviors in stressful situations. This question will be addressed via experimental methods (i.e., threatening participants with electric shocks and then examining G-d accessibility) and via self-report (i.e., questions about means of coping with recent life stressors). H6: I expect to find that participants who are securely attached to G-d will use him as a “safe haven,” which will be demonstrated by accessibility to G-d when they feel threatened. H7: Avoidantly attached people tend to use deactivating strategies when their attachment system is activated. This implies that they minimize the importance of their attachment bond in times of stress and tend to ignore their attachment figure (e.g., Karantzas & Cole, 2011), although in non-stressful situations, their social behavior may to be similar to that of securely attached people (Cassidy, 1994; Slotter & Luchies, 2013). As in any highly stressful situation, the stress induction used in this research is intended to activate the attachment system, which would trigger the safe haven-seeking function in a securely attached individual (e.g., Simpson et al., 2002). Given the deactivating strategies employed by avoidantly attached people, I predict that participants with high G-d attachment avoidance will have the least access to G-d when they are threatened. H8: The nature of anxious attachment is that of ambivalence towards one’s attachment figure, and a tendency to simultaneously seek out and withdraw from the attachment figure (Ainsworth et al., 1978). However, anxiously attached individuals use hyperactivating
emotional strategies in stressful situations, which implies that they are quick to seek out their attachment figure. Although there is some evidence that their ambivalence counterbalances the hyperactivation (e.g., Simpson et al., 1992), the preponderance of research on anxious attachment demonstrates a strong tendency to seek support (e.g., Mikulincer, Gillath, & Shaver, 2002; Vogel & Wei, 2005). Thus, I predict that anxious G-d attachment will be associated with a tendency to have heightened access to G-d. **H9:** I expect to find a similar pattern of results for the G-d attachment style and the self-report coping measures; that is, I hypothesize that secure G-d attachment will be associated with the use of positive religious coping (i.e., turning to G-d) to cope with stressors. I further hypothesize that insecure G-d attachment will be associated with the use of negative religious coping (e.g., feeling anger towards G-d) in the face of stress.

**Study 3 Hypotheses.** Study 3 examines whether people who are securely attached to G-d experience a reduction in (physiological and/or subjective) anxiety after being primed with G-d concepts. As this topic has not been explored previously, my predictions for this study are primarily based on research examining the effect of interpersonal attachment on anxiety reduction (e.g., Ditzen et al., 2008). **H10:** I expect that participants who are securely attached to G-d will experience a greater anxiety reduction (both on the physiological and on the subjective measures) than other participants after being primed with the schema of G-d. **H11:** Anxious G-d attachment may manifest itself in several different ways in terms of reaction to stress (e.g., Collins & Feeney, 2004; McGowan, 2002). Since participants with anxious G-d attachment experience ambivalence towards G-d, priming them with G-d may heighten their stress (because they feel anger and mistrust towards G-d), or it may reduce anxiety (because they still have some positive feelings towards G-d). Thus, I predict that the association between anxious G-d attachment and anxiety reductions will be weak, if it is exists at all, and I make no predictions
about the direction of this association. **H12:** In terms of levels of anxiety after being primed with G-d, research demonstrates that avoidant individuals who receive support from their romantic partners experience anxiety reduction (Simpson et al., 1992). However, in the case of G-d attachment, any support received is entirely a matter of the person’s perception, and avoidant attachment to G-d implies a view of G-d as unsupportive. Therefore, regardless of the level of physiological/subjective anxiety demonstrated by avoidant individuals, I predict that they will not demonstrate anxiety reduction as a result of the G-d prime. **H13:** Since participants who have a secure G-d attachment are expected to automatically turn to G-d regardless of whether or not they experience the G-d prime, I predict that among the control group participants, people with secure G-d attachment will demonstrate a greater reduction in anxiety than people with low G-d attachment or an insecure G-d attachment.

Three studies were conducted to explore the primary hypotheses. All three studies were cross-sectional, between-subject designs. Study 1, a semi-experimental correlational study, was conducted via an online survey. Studies 2 and 3 were experimental studies conducted in a psychology laboratory. IRB approval was obtained for all studies.
Chapter 7: Study 1

The overarching hypothesis in this research is that attachment to G-d is the main religious variable accounting for changes in anxiety. Study 1 addresses this hypothesis on the most basic level by answering the research question: will secure attachment to G-d be associated with lower rates of anxiety over and above the lower rate of anxiety that is accounted for by other religious variables? In order to address this question, a semi-experimental correlational study was conducted using a survey that assessed the three major variables of interest: attachment to G-d, other religious variables, and anxiety.

Method

Participants One-hundred and eighteen subjects in Introductory Psychology courses at Queens College participated in Study 1 in exchange for course credit. Some form of belief in a higher power was a prerequisite for the study, since the majority of the measures were not applicable to atheistic participants. Therefore, people were not eligible to sign up for the study if they indicated on a prescreening measure that they believed that “G-d definitely does not exist” or “G-d probably does not exist.” Three participants were excluded due to not completing all the computer-based questionnaires, resulting in a final sample of 115 (57% female). The mean age was 23.34 ($SD = 6.63$, range = 18 – 50). The ethnic breakdown was as follows: 43.6% White, 22.2% Hispanic, 12.0% Asian-Indian, 9.4% Black, 6% East Asian, 2.6% biracial, and 1.7% West Indian. Conclusive ethnic data were missing for 2.6% of the participants. The religious breakdown was as follows: 47% Christian, 21.4% Jewish, 7.7% non-religious but spiritual believers, 7.7% agnostic, 6% Muslim, 5.1% Hindu, and 1.7% Sikh.
Measures. The Study 1 survey included questionnaires regarding three primary areas of interest (attachment to G-d, psychopathology, and religion), in addition to demographic questions and several covariates. Alphas for all measures are reported in Table 1.

Attachment to G-d

There are several different ways of measuring attachment to G-d. I included two measures of attachment to G-d, which each assessed a slightly different aspect of G-d attachment.

The Attachment to G-d Inventory. The Attachment to G-d Inventory (AGI) was developed by Beck and McDonald (2004) based on the most common measure of adult attachment security, the Experiences in Close Relationships (ECR) scale (Brennan et al., 1998). It includes 28 items, which are rated on a scale of 1 (disagree strongly) through 7 (agree strongly). Fourteen items, such as “I prefer not to depend too much on G-d,” measure attachment avoidance towards G-d. Fourteen items, such as “I worry a lot about my relationship with G-d,” measure attachment anxiety in one’s relationship with G-d. Thus, the AGI yields two dimensional scores, attachment avoidance and attachment anxiety, for each participant. Low scores on both attachment avoidance and attachment anxiety indicate attachment security in one’s relationship with G-d. By performing median splits on the attachment avoidance and attachment anxiety scales, the AGI scores can also be used to divide participants into Secure (low anxiety, low avoidance), Dismissing (low anxiety, high avoidance), Preoccupied (high anxiety, low avoidance), and Fearful (high anxiety, high avoidance) styles (Cooper, Bruce, Harman, & Boccaccini, 2009).

The Measure of Attachment to G-d. The Measure of Attachment to G-d (MAG; Sim & Loh, 2003) is based on four essential dimensions/functions of the attachment relationship: haven
of safety, secure base, seeking/maintaining proximity, and response to separation from G-d. For example, participants are asked to rate questions such as “I seek to be close to G-d” (indicating seeking proximity) or “My relationship with G-d provides me the confidence to explore things around me” (suggesting the secure base function) on a scale of 1 (strongly disagree) to 6 (strongly agree). Four items measure each of these dimensions, for a total of sixteen items. Thus, the MAG is more directly based on the basic definition of attachment (i.e., the extent to which one’s attachment figure serves the four attachment functions) rather than measuring attachment security/insecurity, and so scores on the four dimensions can be combined to yield an estimate of strength of attachment to G-d, with higher scores indicating a stronger attachment to G-d.

**Psychopathology**

Since prior work has measured a wide range of anxiety/stress subtypes, which may contribute to previous inconclusive findings, I included several distinct anxiety/stress measures with hopes of distinguishing exactly which types of anxiety/stress are affected by religion. These included a measure of perceived stress, a measure of manifest anxiety, a measure of trait anxiety, a measure of depression/anxiety/stress in the past week, and a measure of general neuroticism.

**Perceived Stress Scale.** The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) measures the degree to which situations in one’s life are appraised as stressful. Fourteen items are designed to tap how unpredictable and uncontrollable respondents perceive their lives (e.g., “In the last month, how often have you been upset because of something that happened unexpectedly?”), and how much stress they are experiencing (e.g., “In the last month, how often have you felt nervous and stressed?”). Participants are asked to indicate how often they felt a certain way in the preceding month by answering items on a Likert-type scale ranging from 1 (never) to 5 (very often). The PSS yields one overall score;
higher scores imply that recently, the respondent finds their life highly stressful and uncontrollable.

*Taylor Manifest Anxiety Scale (TMAS).* The Taylor Manifest Anxiety Scale - Short (TMAS; Bendig, 1956) is a 20-item measure of trait anxiety, or the tendency to experience anxiety in a range of situations. Respondents answer “true” or “false” to items such as “I worry over money and business” and “I am often afraid that I am going to blush.” Higher scores on this measure indicate a higher level of trait anxiety. This measure has been used frequently in research on attachment and anxiety (e.g., Rowat & Kirkpatrick, 2002).

*Depression Anxiety and Stress Scale.* The Depression Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) includes 21 items that are divided into three groups of questions to yield three separate scales. These include distress along the dimensions of depression (e.g., “I felt that I wasn’t worth much as a person”), anxiety (e.g., “I was worried about situations in which I might panic and make a fool of myself”), and stress (e.g., “I found it hard to wind down”). Respondents indicate how much each statement has applied to them over the past week, on a scale from 1 (did not apply to me at all) to 4 (applied to me very much, or most of the time). Higher scores indicate a greater level of distress in that particular dimension.

*Beck Anxiety Inventory-Trait.* The Beck Anxiety Inventory- Trait (BAI-T) was developed by Kohn, Kantor, DeCicco, and Beck (2008) as a measure of dispositional anxiety that is uncontaminated by depressive items. It is a modified version of the Beck Anxiety Inventory: respondents are instructed to indicate “In general, how often are you bothered by each of the following problems on a day-to-day basis?” (instead of indicating how often they experienced the symptoms over the past week). The BAI-T includes 21 physical (e.g., “feeling hot,” “numbness or tingling”) and cognitive/affective (e.g., “fear of losing control,” “scared”)
symptoms of anxiety that are rated on a scale of 1 (rarely or never) to 4 (almost always). Items are summed to yield a single score, where higher scores suggest higher general trait/dispositional anxiety.

**Neuroticism: Big Five Inventory (BFI-N).** The Big Five Inventory (BFI) is one of the most commonly used measures of personality, and assesses Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness (John, Donahue, & Kentle, 1991). In my study, I only administered the eight-items that measure Neuroticism, (e.g., “I am someone who can be moody”). Respondents indicate how much they agree with each statement on a scale of 1 (disagree strongly) to 5 (agree strongly); higher scores reflect greater Neuroticsism.

**Religious Variables**

I assessed the following religious variables: religious orientation, trust/mistrust in G-d, strength of belief in G-d, positive and negative religious coping, positive and negative religious support, organized and non-organized religious activity, and several specific doctrinal beliefs. This list of religious dimensions is by no means exhaustive, but was compiled based on theory as well as previous research linking some of these dimensions to anxiety levels. It includes negative aspects of religion as well, which have in some cases been linked to higher anxiety (e.g., negative religious coping).

**Belief in G-d.** I used a single item to measure strength of belief in G-d (Gervais & Norenzayan, 2012): “Please rate how strongly you believe in G-d on a scale of 1 (G-d definitely does not exist) to 100 (G-d definitely exists).”

**Duke University Religion Index.** I used the Duke University Religion Index (DUREL; Koenig, Meador, & Parkerson, 1997) to assess frequency of religious attendance, frequency of private religious activity, and intrinsic religiosity. This index was developed as a short and
effective measure of key religious variables. It includes five items, divided into three subscales. Subscale 1 assesses frequency of religious attendance with the item “How often do you attend church or other religious meetings,” answered on a scale of 1 (more than once/week) to 6 (never). Subscale 2 assesses frequency of private religious activity with the item “How often do you spend time in private religious activities, such as prayer, meditation, or Bible study,” on a scale of 1 (more than once a day) to 6 (barely or never). Subscale 3 measures intrinsic religiosity with three items such as “My religious beliefs are what really lie behind my whole approach to life” rated on a scale of 1 (definitely true of me) to 5 (definitely not true). All items are reverse-scored, such that higher scores on each of the three scales indicate greater religiosity/religious activity.

Religious Beliefs. I assessed two specific religious beliefs that have been previously related to anxiety (Ellison et al., 2009): belief in an afterlife and “sin belief,” or notions of the intrinsic sinfulness of human nature. Both of these beliefs were measured with a single item taken from the nationally-conducted General Social Survey (GSS; Davis & Smith, 1996). Afterlife belief was assessed by asking “Do you believe there is a life after death?”; respondents answered yes, no, or undecided. Sin belief was assessed with an item that read “Please rate your view of human nature on a scale of 1 to 7, with 1 being Human nature is basically good and 7 being Human nature is fundamentally perverse and corrupt.”

Trust/Mistrust in G-d. The Brief Measure of Trust/Mistrust in G-d (TIGMIG; Rosmarin, Pirutinsky, & Pargament, 2011) was administered to assess trust/mistrust in G-d. Three items reflecting trust in G-d (TIG; e.g., “G-d cares about my deepest concerns”) and three items assessing mistrust in G-d (MIG; e.g., “G-d hates me”) were rated for degree of belief on a scale of 1 (not at all) to 5 (very much).
Religious Coping. Religious coping, which can be divided into negative religious coping strategies and positive religious coping techniques, was measured using the Brief Religious Coping measure (Brief RCOPE; Pargament, Feuille, & Burdzy, 2011). Respondents are asked to indicate how frequently they use each method to cope with negative life events, on a scale of 1 (not at all) to 4 (a great deal). Seven items assess negative religious coping (e.g., “Wondered what I did for G-d to punish me”) and seven items reflect positive religious coping methods (e.g., “Sought help from G-d in letting go of my anger”). This yields two separate scores, with higher scores indicating higher use of the respective coping method.

Religious Support. I measured religion-based and congregational-based social support with the Religious Support scale (Krause, 1999). This measure includes eight items divided into four subscales: Support Received (e.g., “How often do the people in your congregation/ your religious community make you feel loved and cared for?”), Support Provided (e.g., “How often do you listen to the people in your congregation/ religious community talk about their private problems and concerns?”), Negative Interaction (e.g., “How often are the people in your congregation/ religious community critical of you and the things you do?”), and Anticipated Support (e.g., “If you were ill, how much would the people in your congregation/ religious community be willing to help out?”). Items are answered on a scale of 1 (a great deal) to 4 (none). All items were reverse-scored, such that higher scores on the four subscales indicated higher levels of Support Received, Support Provided, Negative Interactions, and Anticipated Support.

Demographic Questionnaires

I assessed nine basic demographic items, including age, gender, education, income, marital status, country of birth, fluency in English, religious denomination, and ethnicity.
Covariates

**Social Support.** Perceived social support was examined via a single item previously used in the national Behavioral Risk Factor Surveillance System survey (Centers for Disease Control and Prevention [CDC], 2009) which asked participants: “How often do you get the social and emotional support you need? Please include support from any source.” This item was scored on a five-point scale ranging from 1 (*Never*) to 5 (*Always*).

**Social Integration.** Secular social integration, or the amount of social interaction outside of religious functions, was measured via a Social Integration (SI) scale taken from the nationally-conducted General Social Survey (GSS; Davis & Smith, 1996). This scale included three items: respondents rated the frequency with which they spend a social evening with relatives, neighbors, and non-neighborhood friends, on an 8-point scale from 1 (*never*) to 8 (*almost every day*). Higher scores indicate greater secular social integration.

**Physical Activity.** The assessment of physical activity was based on items previously used in the national Behavioral Risk Factor Surveillance System survey (CDC, 2009). Participants were asked to specify “In a usual week, how many minutes of moderate or vigorous physical activity do you do (for example, brisk walking, bicycling, vacuuming, gardening, aerobics, or anything else that causes some increase in breathing or heart rate)?”

**Schedule of Recent Experience.** In order to assess whether a participant had experienced a great deal of recent stress, I administered the Schedule of Recent Experience (SRE; Holmes, 1986). This questionnaire lists 42 events that are considered to be stressful (e.g., “changing to a different line of work,” “divorce”). Respondents indicate how many times each event has happened to them in the past year on a scale ranging from 1 (*did not happen to me in the past year*) to 5 (*four or more times in the past year*). To calculate a total score, each event is assigned
a specific weight (i.e., how stressful it generally is) derived from ratings made by the original norming samples. The total score is a reflection of the amount of stress experienced by the respondent in the past year.

*Recent Changes in Religion.* To control for recent changes in participants’ relationship with G-d, I constructed two yes/no items for the purposes of this study: “Have you recently (e.g., within the past two years) become much more religious/spiritual, or become much more close to G-d?” and “Have you recently (e.g., within the past two years) become much less religious/spiritual, or become much less close to G-d?”

*Experiences in Close Relationships- Short.* General adult attachment style was assessed using a short version of the Experiences in Close Relationships questionnaire (ECR-S; Wei, Russell, Mallinckrodt, & Vogel, 2007). As per Cheng and Kwan (2008), I revised the wording of “romantic partner” to “close others” so that the measure reflects general adult attachment rather than romantic attachment specifically. This measure includes 12 items that are divided into a 6-item Attachment Anxiety subscale (e.g., “I worry that close others won’t care about me as much as I care about them”) and a 6-item Attachment Avoidance subscale (e.g., “I try to avoid getting close to close others”). Items are rated on a scale of 1 (*I disagree strongly*) to 7 (*I agree strongly*). Higher scores on each scale indicate a higher level of attachment anxiety or avoidance.

*Procedures.* Study 1 was conducted online through the web survey development company SurveyMonkey. Participants could choose to sign up after reading a brief abstract of the study. Before beginning the study, participants were required to give informed consent. Participants were allowed to withdraw from the study at any time without penalization.

After signing up for the study, participants were able to access the URL to the study. They were allowed to take the survey on any computer at any time during a four-month period.
(based on the college semester). Once a participant opened the survey, they had to complete the questionnaires in one session.

Study 1 Results

Descriptive statistics and alphas for all measures are reported in Table 1. Internal consistency for most measures used in this study was adequately high. Scores on the primary independent variables of interest (AGI Anxiety, AGI Avoidance, and MAG Total) did not differ by gender or by religious denomination.

Hierarchical multiple regression and correlational analyses were utilized to examine Study 1 hypotheses. I predicted that (1) secure attachment to G-d would account for lower general anxiety and stress over and above the variance in general anxiety that is accounted for by other religious variables; (2) anxious attachment to G-d would be associated with general anxiety measures; (3) avoidant attachment to G-d would be positively correlated with general anxiety (although perhaps less strongly correlated than anxious G-d attachment); (4) G-d attachment style would be related to all of the general anxiety measures, but would be most strongly related to manifest and trait anxiety; (5) other negative aspects of religion would be related to higher general anxiety and stress, while positive aspects of religion would be associated with lower rates of general anxiety.

Does Attachment to G-d Predict Lower General Anxiety? In order to test my first hypothesis, I conducted several multiple regression analyses using religious variables and attachment to G-d as predictors of the psychopathology measures. To ensure the validity of the regression analysis I minimized the number of independent variables, excluding predictor variables that significantly and conceptually overlapped with other predictor measures or that were only weakly correlated with the dependent variables. Excluded variables included: all
MAG subscales except for the MAG Total Attachment to G-d score (due to high multicollinearity with other variables); Brief Trust and Mistrust in G-d (due to high multicollinearity / construct overlap with attachment to G-d); and all Religious Support subscales except for Religious Support Received (due to no correlations and weak theoretical relationship). All predictor variables were mean-centered (Aiken & West, 1991). Tests for multicollinearity indicated that all included variables were sufficiently independent (Tolerance statistics > 0.1). The hierarchical multiple regressions incorporated two steps. Step 1 included a range of religious constructs, including strength of belief in G-d, sin belief, afterlife belief, DUREL religious attendance, DUREL private religious activity, DUREL intrinsic religiosity, positive / negative Religious Coping, and Religious Support Received. Step 2 added three measures of attachment to G-d: AGI Anxiety, AGI Avoidance, and the MAG Total score (measuring strength of attachment). I conducted separate regressions to assess the effect of religion and attachment to G-d on the seven measures of psychopathology included in my study: perceived stress, manifest anxiety, trait anxiety, depression in past week, anxiety in past week, stress in past week, and overall neuroticism.

All seven regression analyses yielded significant results (see Tables 2 – 8 for all values). Results are summarized here.

(1) Perceived Stress (PSS): Step 1, which included all religious variables mentioned above, predicted perceived stress, \( R^2 = .17, \quad R^2_{\text{adj}} = .10, \quad F(9, 103) = 2.33, \quad p = .02. \) Step 2, which added the three attachment to G-d variables, still predicted perceived stress, \( R^2 = .31, \quad R^2_{\text{adj}} = .23, \quad F(12, 100) = 3.77, \quad p < .001. \) Addition of ATG improved prediction, supporting my hypothesis that ATG would predict anxious pathology over and above other religious variables, \( R^2 \text{ change} = .14, \quad F \text{ change}(3, 100) = 6.88, \quad p < .001. \) In regards to the religious variables, in Step 1 only use of
negative religious coping (RCOPE-Negative) predicted increased perceived stress ($\beta = .24, p = .01$). In Step 2 RCOPE-Negative dropped to non-significance, while belief in an afterlife marginally predicted less perceived stress ($\beta = -.19, p = .06$) and positive religious coping marginally predicted increased perceived stress ($\beta = .28, p = .09$). All three ATG variables predicted perceived stress: attachment to G-d anxiety predicted increased perceived stress ($\beta = .42, p < .001$), attachment to G-d avoidance predicted decreased perceived stress ($\beta = -.45, p = .01$), and strength of attachment to G-d predicted decreased perceived stress ($\beta = -.40, p = .05$).

(2) Manifest Anxiety (TMAS): Step 1, including all religious variables ($R^2 = .15, R^2_{adj} = .07, F(9, 103) = 1.97, p = .05$), and Step 2, which added ATG ($R^2 = .18, R^2_{adj} = .08, F(12, 100) = 1.84, p = .05$), both predicted manifest anxiety. More specifically, in Step 1 use of positive religious coping predicted higher manifest anxiety ($\beta = .36, p = .02$) and religious support received predicted lower manifest anxiety ($\beta = -.27, p = .02$). In Step 2 religious support received predicted lower manifest anxiety ($\beta = -.31, p = .01$). However, of the attachment to G-d variables, only G-d attachment avoidance marginally predicted manifest anxiety ($\beta = -.30, p = .10$), and addition of ATG variables in Step 2 did not significantly improve prediction.

(3) BAI-T: Step 1 ($R^2 = .20, R^2_{adj} = .13, F(9, 103) = 2.93, p < .001$) and Step 2 ($R^2 = .25, R^2_{adj} = .16, F(12, 100) = 2.78, p < .001$) both predicted variance in trait anxiety. Addition of ATG in Step 2 marginally improved prediction, $R^2_{change} = .05, F_{change}(3, 100) = 2.06, p = .11$. In terms of individual variables, in Step 1 belief in G-d ($\beta = -.25, p = .05$) and frequent religious attendance ($\beta = -.31, p = .05$) predicted decreased trait anxiety, while use of positive religious coping ($\beta = .35, p = .02$) and negative religious coping predicted increased trait anxiety ($\beta = .27, p < .001$). In Step 2, with the addition of ATG variables, attendance at religious services predicted decreased trait anxiety ($\beta = -.36, p = .03$) while positive religious coping predicted
increased trait anxiety ($\beta = .41, p = .02$). Attachment to G-d variables, including AGI-Avoidance ($\beta = -.32, p = .07$) and MAG-total ($\beta = -.38, p = .06$), marginally predicted decreased trait anxiety.

(4) DASS-Stress: Step 1, which included all the religious variables mentioned above, predicted experienced stress in the past week, $R^2 = .17, R^2_{adj} = .10, F (9, 103) = 2.29, p = .02$. Adding the three attachment to G-d variables (Step 2) still predicted perceived stress, $R^2 = .27, R^2_{adj} = .18, F (12, 100) = 3.02, p < .001$. Addition of ATG improved prediction, supporting my hypothesis that ATG would predict anxious pathology over and above other religious variables, $R^2_{change} = .10, F_{change} (3, 100) = 4.48, p = .01$. In regards to the religious variables, in Step 1 positive ($\beta = .32, p = .03$) and negative religious coping ($\beta = .28, p < .001$) positively predicted experienced stress. In Step 2 negative religious coping dropped to non-significance while positive religious coping still predicted increased experienced stress ($\beta = .43, p = .01$). All three ATG variables accounted for variance in experienced stress: attachment to G-d anxiety predicted increased experienced stress ($\beta = .33, p = .01$) while attachment to G-d avoidance ($\beta = -.35, p = .05$) and strength of attachment to G-d ($\beta = -.44, p = .03$) predicted decreased experienced stress.

(5) DASS-Anxiety: Step 1, including all the religious variables, predicted general anxiety in the past week, $R^2 = .17, R^2_{adj} = .10, F (9, 103) = 2.38, p = .02$. Adding the three G-d attachment variables in Step 2 still predicted perceived stress ($R^2 = .24, R^2_{adj} = .15, F (12, 100) = 2.62, p < .001$), and in fact improved prediction ($R^2_{change} = .07, F_{change} (3, 100) = 2.92, p = .04$), supporting my hypothesis that ATG would predict anxious pathology over and above other religious variables. In Step 1 only negative religious coping predicted increased recently-experienced general anxiety ($\beta = .32, p < .001$); positive religious coping was marginally significant in predicting increased general anxiety ($\beta = .28, p = .06$). However, in Step 2 negative
religiously significant. The addition of attachment to G-d improved prediction, $R^2$ change = .13, $F$ change (3, 100) = 7.05, $p < .001$. In Step 1, belief in G-d predicted decreased depression ($\beta = -.40, p < .001$) while positive ($\beta = .32, p = .03$) and negative religious coping ($\beta = .28, p < .001$) were positively related to depression. However, in Step 2 belief became marginally significant ($\beta = -.22, p = .08$) and negative religious coping dropped to non-significance. Positive religious coping still predicted increased experienced depression ($\beta = .42, p = .01$), while intrinsic religiosity predicted decreased depression ($\beta = -.31, p = .04$). All three ATG variables predicted recently-experienced depression. More specifically, attachment to G-d anxiety predicted increased experienced depression ($\beta = .28, p = .01$) while attachment to G-d avoidance ($\beta = -.51, p < .001$) and strength of attachment to G-d ($\beta = -.60, p < .001$) predicted decreased experienced depression.

(7) BFI-Neuroticism: The religious variables included in Step 1 predicted neuroticism, $R^2 = .15$, $R^2_{\text{adj}} = .08$, $F$ (9, 103) = 2.01, $p = .05$. Adding attachment to G-d variables in Step 2 still accounted for variance in neuroticism ($R^2 = .22$, $R^2_{\text{adj}} = .12$, $F$ (12, 100) = 2.29, $p = .01$), and Step 2 improved prediction of neuroticism, $R^2$ change = .07, $F$ change (3, 100) = 2.83, $p = .04$. Negative religious coping was the only variable in Step 1 that predicted increased neuroticism ($\beta = .25, p = .01$). In Step 2 negative religious coping dropped to non-significance, and the only
variable that predicted increased neuroticism was attachment to G-d anxiety ($\beta = .30, p = .01$).

G-d attachment avoidance marginally predicted decreased neuroticism ($\beta = -.31, p = .08$)

As demonstrated by the multiple regressions, all seven psychopathology outcome measures were associated with either religious, G-d attachment, or both sets of variables. Of the religious variables, positive and negative religious coping were most frequently predictive of psychopathology, while belief in G-d, attendance at religious services, religious support received, and intrinsic religiosity all predicted lower psychopathology on some measures. Adding attachment to G-d in Step 2 of the regressions improved prediction in the majority of the regressions, and the G-d attachment variables were significantly related to a number of the outcome variables. In terms of directionality, G-d attachment anxiety invariably predicted higher psychopathology, while G-d attachment avoidance and strength of G-d attachment were associated with lower reported psychopathology.

**Attachment to G-d Style and General Anxiety.** To evaluate the strength of the relationship between G-d attachment style and different types of general anxiety (H2-H4), I analyzed the correlations between the primary ATG variables (AGI Anxiety, AGI Avoidance, and MAG Total) and the seven psychopathology measures. See Table 9 for all correlations. As predicted (hypothesis 2), anxious attachment to G-d was generally associated with the anxiety measures: anxious G-d attachment was positively correlated with perceived stress (PSS), trait anxiety (BAI-T), recently experienced stress (DASS-STR), recently experienced anxiety (DASS-ANX), recently experienced depression (DASS-DEP), and neuroticism (BFI-Neuroticism). In partial support of hypothesis 3, avoidant attachment was unrelated to all the psychopathology measures administered, while strength of attachment (MAG Total, which was negatively correlated with avoidant G-d attachment) was negatively correlated with perceived stress,
recently experienced depression, and neuroticism. Hypothesis four was not supported: manifest anxiety was unrelated to G-d attachment, and trait anxiety was only related to G-d attachment anxiety.  

**Non-attachment Religious Variables and General Anxiety.** To test my hypothesis that positive and negative religious variables would be differentially related to psychopathology (H5), I analyzed the correlations between the religious variables and the psychopathology measures. Hypothesis five was supported: more positive aspects of religion, including strong belief in G-d, belief in an afterlife, frequency of attendance at religious services, frequency of private religious activities, intrinsic religiosity, trust in G-d, religious support received, and anticipated religious support were all associated with lower stress/anxiety/depression, while mistrust in G-d and negative religious coping were associated with higher stress/anxiety/depression (see Tables 10A – 10B for all correlations).

More specifically, belief in G-d was negatively associated with perceived stress, trait anxiety, recently experienced depression, and neuroticism. Belief in an afterlife was negatively correlated with perceived stress and neuroticism. Frequency of attendance at religious services was associated with lower recent depression and neuroticism. Frequency of private religious activities was associated with lower depression. Intrinsic religiosity was negatively correlated with perceived stress, recent depression, and neuroticism. Trust in G-d was negatively associated

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4 In order to control for possible co-varying variables, partial correlations between the three ATG variables (MAG Total and 2 AGI subscales) and the psychopathology variables were run while controlling for the potentially confounding variables. These included general attachment style (ECR-S), recent stressful events (SRE), general social support support, social integration, physical activity, and recent changes in religion. Controlling for social integration and physical activity did not lead to a difference in the significance of the relevant correlations. However, other covariates affected significance of several previously significant correlations. See Table 9 footnotes for details.
with manifest anxiety, recent depression, and neuroticism. Mistrust in G-d was positively correlated with recent stress and recent depression. Negative religious coping was positively associated with perceived stress, trait anxiety, recent stress, recent anxiety, recent depression, and neuroticism. Religious support received was negatively correlated with perceived stress and manifest anxiety. Anticipated religious support was negatively correlated with perceived stress, manifest anxiety, and recent depression. Sin belief, use of positive religious coping techniques, religious support provided, and negative religious interactions were unrelated to the anxiety, stress, and depression measures administered.

Study 1 Discussion

Attachment to G-d, Religion, and General Anxiety. My primary premise (hypothesis 1) in Study 1 was supported: secure attachment to G-d accounted for lower anxiety over and above other religious variables. More specifically, adding the attachment to G-d variables to the other religious variables significantly improved prediction of perceived stress, stress/anxiety/depression in the past week, and neuroticism, and marginally improved prediction of trait anxiety. In further support of my hypothesis, the attachment to G-d variables, as compared to the religious variables, fully accounted for the variance in several psychopathology variables (perceived stress and neuroticism); that is, after the addition of ATG, all religious variables dropped to non-significance in predicting the psychopathology variables. This implies that, as I theorize, attachment to G-d is a primary religious variable relating to anxiety. It further implies that one reason for previous mixed findings regarding an association between religion and anxiety may be the different aspects of religion being measured, including both positive (e.g., secure attachment to G-d) and negative aspects of religion (e.g., insecure attachment to G-d). I included three indices of attachment to G-d in the final analyses: attachment anxiety, attachment
avoidance, and overall strength of attachment to G-d. Anxiety toward G-d predicted increased perceived stress, increased recent stress, increased recent depression, and higher neuroticism. AGI Avoidance predicted lower perceived stress, lower recent stress, and lower recent depression, and marginally predicted lower manifest anxiety and lower trait anxiety. Greater strength of attachment to G-d predicted lower perceived stress, lower recent stress, and lower recent depression, and marginally predicted lower trait anxiety.

Based on the correlational analyses, I found that high anxious attachment to G-d was indeed associated with higher general anxiety (hypothesis 2), and that a strongly secure attachment to G-d was associated with lower psychopathology (hypothesis 3). However, my hypothesis that avoidant attachment would also be correlated with anxiety (hypothesis 3) was unsupported: avoidant G-d attachment was not correlated with any of the self-reported psychopathology measures. My fourth hypothesis that manifest and trait anxiety would be the anxiety constructs most strongly related to G-d attachment style, was also only partially supported: manifest anxiety was unrelated to G-d attachment, while trait anxiety was only correlated with the Attachment to G-d measure of G-d attachment anxiety.

**Religion and General Anxiety.** I addressed another important question in this study by including a wide range of religious variables: which religious constructs (aside from attachment to G-d), if any, are related to general anxiety? Given past mixed results and previous papers that have only included one or two religious constructs, Study 1 was ideally structured to further examine this question. Indeed, clear differences emerged in terms of which religious variables were most related to general anxiety.

Strength of belief in G-d (negatively correlated with perceived stress and trait anxiety), negative religious coping (positively correlated with perceived stress, trait anxiety, recent stress,
and recent anxiety), religious support received (negatively correlated with perceived stress and manifest anxiety), and religious support anticipated (negatively correlated with perceived stress and manifest anxiety) were the religious variables that were most strongly associated with stress and general anxiety. Belief in an afterlife (negatively correlated with perceived stress), intrinsic religiosity (negatively correlated with perceived stress), trust in G-d (negatively correlated with manifest anxiety), and mistrust in G-d (positively correlated with recent stress) were all related to one measure of stress or general anxiety. Sin belief, frequency of attendance at religious services, private religious activity, positive religious coping, religious support provided, and negative religious interactions were unrelated to general anxiety and stress outcomes. Of the general anxiety and stress outcome measures, perceived stress was related to the most religious variables.

I was also able to more closely examine directional relationships between religion and general anxiety/stress by looking at the associations between these constructs through regression analyses. Notably, when attachment to G-d was included, perceived stress was no longer related to any of the non-attachment religious variables. Manifest anxiety was only related to religious support received, trait anxiety was negatively associated with religious attendance and positively associated with positive religious coping, recent stress was positively associated with positive religious coping, and recent anxiety was positively associated with positive religious coping.

An overall prediction (hypothesis 5) was that positive aspects of religion would be associated with lower anxiety, while negative aspects of religion would be associated with higher anxiety. The direction of the associations was generally in line with my predictions: strength of belief in G-d, intrinsic religiosity, and frequent attendance at religious services all predicted lower psychopathology, while the use of negative religious coping techniques predicted higher rates of psychopathology. Positive religious coping was the only nominally positive religious
construct that was related to higher psychopathology: although it was not directly correlated with any psychopathology measures, when combined with other religious predictor variables it did predict higher trait anxiety and greater recent stress, anxiety, and depression in the regression analyses. Although this finding seems counter-intuitive given the direction of the other findings, it is in fact logical as it measures how frequently the individual has been using positive religious coping skills to cope with a recent stressor. All the psychopathology variables predicted by positive religious coping were measures of the level of stress/anxiety/depression recently or currently experienced. Therefore, it is likely that the association between positive religious coping and the psychopathology variables was driven by the naturally increased use of coping methods (in this case, PRC techniques) when individuals are experiencing high stress or depression. In further support of this, positive religious coping was completely unrelated to trait neuroticism, which serves as a more stable measure of personality structure that would be uninfluenced by recent stressors. In fact, positive religious coping has been found to correlate with a range of positive mental health outcomes, including increased well-being and increased growth after trauma, but it is not necessarily associated with lower experienced psychopathology (Pargament, Feuille, & Burdzy, 2011; Pargament, Koenig, & Perez, 2001).
Chapter 8: Study 2

Following Study 1, which established the initial associations between G-d attachment and anxiety, Study 2 was designed to provide support for my proposed mechanism through which the association forms. I hypothesized that secure G-d attachment reduces anxiety over time because people who are securely attached to G-d turn to him in times of stress. Study 2 was a between-subjects experimental study structured to examine this hypothesis. The study aimed to induce anxiety in participants and then examine whether they turn to G-d as a coping mechanism. The independent variables were condition (stress/no stress) and attachment to G-d, and the dependent variable was activation of G-d-related concepts.

Method

Participants As in Study 1, people were recruited for Study 2 through the use of the Queens College subject pool, which includes students enrolled in Introductory Psychology courses. Given that many of the study questions would not make sense in an atheistic context, students were not eligible if they indicated during pre-screening that they believed that “G-d definitely does not exist” or “G-d probably does not exist.” One hundred and forty-eight subjects participated in Study 2 in exchange for course credit. Four participants randomly assigned to the experimental condition declined to participate in the study following the introductory information (where they are told that they will be receiving electric shocks). These participants were given credit, debriefed, and asked to keep the study confidential. This left a final sample of n = 144 (63.2% female). Subjects were randomly assigned to one of the two conditions. Of the final 144 subjects, 76 (52.8%) were assigned to the experimental condition, while 68 (47.2%) were assigned to the control condition. The mean age was 22.68 (SD = 5.39, range = 18 – 53). The ethnic breakdown was as follows: 32.6% White, 18.8% Hispanic, 14.6% Asian-Indian,
14.6% East Asian, 10.4% Black, 5.6% “Other” (e.g., Alaskan Indian; West Indian; Filipino), and 3.5% biracial. The religious breakdown was as follows: 42.4% Christian, 20.1% Jewish, 14.6% Muslim, 9.7% non-religious believers, 4.2% Hindu, 4.2% Buddhist, 1.4% Sikh, 1.4% Taoists, 1.4% atheistic, and 0.7% agnostic.

Measures and Materials.

Independent Variables

1) Stress Induction. In order to induce stress, participants were told that they would shortly be receiving harmless but slightly painful electric shocks as part of the experiment. This paradigm is loosely based on the stress induction used by Simpson and colleagues (1992) in their study on support-seeking between partners; although they did not explicitly threaten participants with electric shocks, they implied that participants would shortly be receiving electric shocks. Since G-d is likely to be sought out only under more threatening conditions (Kirkpatrick, 2005), I emphasized the threat and enhanced the realism of the stress induction by explicitly telling participants that they would receive electric shocks and then attaching them to ECG-recording physiological equipment via electrodes in order to further create the illusion that they would be shocked. In the control condition, participants were attached to the same equipment, but were told that they would be undergoing routine painless physiological data recording.

2) Attachment to G-d. Attachment to G-d was measured with the same two ATG measures used in Study 1 (the AGI and the MAG).

Dependent Variable

Lexical Decision Task. In order to assess whether subjects sought out G-d as a safe haven following the threat, I utilized a lexical decision task (LDT; Meyer & Schvaneveldt, 1971), which is a well-known means of assessing the implicit cognitive accessibility of specific
schemas. The particular LDT that I used was designed by Granqvist and colleagues to assess the cognitive accessibility of the G-d schema (Granqvist, Mikulincer, Gewirtz, & Shaver, 2012). Participants were presented with a string of letters on a computer screen and told “as quickly as possible, press f if the letter string is a word, and j if the letter string is not a word.” Reaction times (RTs) served as a measure of the accessibility of thoughts related to the target words: the shorter the RT, the greater the accessibility of that schema. Paralleling Granqvist et al. (2012), I used target words that express a relation to G-d. Participants were seated at a computer in a quiet room without distractions. The task was run on a computer and programmed using DirectRT Software (produced by Empirisoft). The letter strings were displayed in aqua lettering on a black background in the center of the monitor screen. After 18 practice trials in which 3 nonwords and 3 neutral words were randomly presented, participants completed 80 trials. Each trial of the task began with an x in the middle of the screen (for 400 ms, to focus attention on that area), immediately followed by one of 20 target letter strings (for 1,000 ms). The target letter strings were divided into three categories: (a) 10 nonwords (e.g., tonobkoe, nowdiw), presented in 40 trials; (b) five neutral words (e.g., notebook, window) presented in 20 trials; (c) and five words expressing a relation to God (belief, prayer, devotion, elation, and salvation) presented in 20 trials. Each word was thus presented in four trials. The letter strings were presented in random order. The reaction time in each trial was used as a measure of schema accessibility, with faster RT indicating greater accessibility. RTs faster than 300 ms or slower than 1,500 ms were omitted, as were erroneous responses (identifying nonwords as words, or vice versa).

As with all of the lexical decision task procedures, these cut-offs were selected based on the original G-d related lexical decision task (Granqvist et al., 2012) in order to closely replicate the original paradigm. Careful examination of those responses which were above or below the cut-off points demonstrated that they made up a negligible number of responses: .03% of RT responses were below 300 ms, while 3% of RT responses were above 1,500 ms.
Additional “Dependent Variables”

In addition to the experimental, real-time assessment of whether threatened participants turn to G-d, I measured whether participants tend to turn to G-d as a general coping strategy, as moderated by their attachment relationship with G-d. This was assessed using two measures: the Brief Religious Coping Measure (RCOPE; Pargament et al., 2000) described previously, and the Brief COPE, which measures a range of possible coping strategies. These retrospective measures served as corroboratory self-reported evidence that securely attached individuals turn to G-d as a safe haven.

_Brief Coping Inventory._ The Brief Coping Inventory (COPE; Carver, 1997) assesses the use of 14 different types of general coping techniques. Participants were directed to specify a stressful situation they had experienced within the past year, and then indicate how frequently they used different ways of coping with the problem. Twenty-eight items were rated on a scale of 1 (I haven’t been doing this at all) to 4 (I’ve been doing this a lot). The 28 items were combined to yield 14 subscales (2 items each), each reflecting a different coping technique. For example, use of “Self-distraction” coping techniques were measured using the items “I’ve been turning to work or other activities to take my mind off things” and “I’ve been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.” For the purposes of this study, I was primarily interested in the use of “Religious” coping techniques, which was measured with the items “I’ve been trying to find comfort in my religion or spiritual beliefs” and “I’ve been praying or meditating.”

_Procedures._ Participants signed up for Study 2 after viewing a brief description of the study. This description, like the consent form, did not specify the exact procedures that would be used in the research (since the nature of the stress induction required that it be unexpected). The
study was conducted in the lab with one participant at a time. Participants signed a consent form upon arriving in the lab. They were allowed to withdraw from the experiment at any time, with no penalty.

Each participant was randomly assigned to either the stress (experimental) condition or the no-stress (control) condition. After being seated and made comfortable, adhesive electrodes were placed on the back of the participant’s hands and then connected to an SA Isolated Instrumentation Bioamplifier machine (James Long Company). For the control group, conditions were set up so as to minimize stress: participants were told that their heart rate would be recorded through the electrodes, and were reassured that the procedure would be painless with the words “…the bioamplifier will be recording data, but will not be sending any information or signals back to your body. The equipment is non-invasive, and it is similar to medical equipment that you would find in a doctor’s office.” For the experimental group, conditions were set up so as to maximize stress: participants were told that they would be receiving electric shocks through the electrodes. Specifically, they were told, “Shortly, you are going to be exposed to a situation and set of experimental procedures that typically arouse considerable anxiety and distress in most people. Through these electrodes, you will be given several electrical shocks over the course of the study. These shocks may be somewhat painful, but they are not physically harmful.” Following the experimental induction, the experimenter went into an adjoining room to ostensibly “set up the equipment.” After three minutes during which the participant heard computer noises and equipment sound effects (including shock sound effects, for the experimental condition) coming from the adjoining room, the experimenter returned and told the participant that since the equipment was “taking a while to boot up,” they would move on to the next part of the study “while the equipment finishes booting up.” At this point, the lexical
decision task was administered while the experimenter waited in the adjacent room. As described above, the lexical decision task was administered on the computer using DirectRT (manufactured by Empirisoft) software. Reaction time was measured in response to three categories of words: non-words, neutral words, and G-d-related words. A faster reaction time to G-d related words implies that that schema has been cognitively activated. After the participant informed the experimenter that he/she had finished the LDT, the experimenter waited another minute, then re-entered and told the participant that due to malfunctioning equipment, the shock sequence (experimental condition)/ heart rate recording (control condition) would not take place. The participant was unhooked from the electrodes and then asked to complete questionnaires (presented on the computer, through SurveyMonkey). After completing the questionnaires, a manipulation check for suspicion (“Did you believe you would get shocked/ have your heart rate recorded?”)\(^6\) and for the efficacy of the induction (“How did you feel when I put the electrodes on your hands?”) was done. Finally, participants were fully debriefed regarding the procedures and purpose of the study. Participants in the experimental condition were asked to sign a post-debriefing consent form indicating if they still consented to the use of their data.\(^7\)

**Study 2 Results**

The second study in this project experimentally explored whether secure G-d attachment predicts peoples’ tendency to turn towards G-d when they are stressed or threatened. There were two independent variables: condition (stress or no stress) and attachment to G-d. Attachment to G-d was measured by the AGI as well as the MAG. The AGI yielded two continuous scores

\(^6\) Only 9 participants reported having any suspicion that they might not be receiving shocks. Due to unequal sample sizes, no analysis of group differences was performed.

\(^7\) All participants consented to the use of their data at the post-debriefing time.
reflecting the dimensions of attachment anxiety and attachment avoidance toward G-d. These scores were also combined to create a categorical “style” score for each subject. People scoring low on both of these dimensions are classified as secure, those scoring low on avoidance and high on anxiety can be thought of as “anxious” (sometimes termed “preoccupied”), those scoring high on avoidance and low on anxiety are considered “dismissing-avoidant,” and those scoring high on avoidance and high on anxiety are called “fearful-avoidant” (see Figure 1). The MAG Total score was used as a measure of strength of attachment to G-d. I also dichotomized the MAG score into high-strength of attachment and low-strength of attachment using a median split.

Study 2 included two operationalizations of the dependent variable, that is, whether individuals turn to G-d in times of stress. The first dependent variable was an implicit measure of real-time proximity-seeking (as assessed via the lexical decision task). The lexical decision task measured reaction time to G-d-related words, as compared to reaction time to other concepts (i.e., neutral words). I computed a difference score for every participant by subtracting reaction time for neutral words from reaction time to G-d words. This difference score served as the dependent variable, with lower scores indicating a more rapid response to G-d words and therefore suggesting that the “G-d” schema had been activated. The second dependent variable included two explicit retrospective self-report measures of coping strategies. The self-report assessments measured whether participants tend to cope with stressful events using positive or negative religious coping techniques (Brief RCOPE) and whether participants generally cope with stressful events using religion (Brief COPE).

Descriptive statistics and alphas for all measures are reported in Table 11. Internal consistency for scales was acceptable or high. Based on prior research and theory, I predicted
that people who were securely attached to G-d would seek him out when stressed (H6), while avoidantly attached individuals would be least likely to turn to G-d (H7) and anxious G-d attachment would be associated with a tendency to turn towards G-d (H8). In terms of retrospective report of coping strategies, I hypothesized that secure G-d attachment would be correlated with the use of positive religious coping while insecure G-d attachment would predict negative religious coping when stressed (H9).

**G-d Attachment Style and Implicit Turning to G-d.** I evaluated hypotheses 6 through 8 by conducting univariate factorial analyses of variance (ANOVAs) which evaluated the effects of attachment to G-d and experimental condition (stress/ no-stress) on the lexical decision task difference scores. I first tested the main effects and interaction of attachment to G-d style and condition on the lexical decision task difference scores. The ANOVA revealed that lexical decision task difference scores varied among individuals with different attachment styles, \(F[3, 143] = 2.93, p = .04, \eta^2_p = .06\). The main effect of condition \(F[1, 143] = 0.52, p = .47, \eta^2_p < .01\) as well as the interaction effect were not significant \(F[3, 143] = 0.09, p = .97, \eta^2_p < .01\). Post-hoc analyses of the significant attachment style effect using Fisher’s Least Significant Difference test demonstrated that individuals with a dismissing-avoidant ATG style scored lower on lexical decision task difference scores than all three other ATG styles (dismissing-avoidant versus secure, \(p = .01\), dismissing-avoidant versus anxious, \(p = .04\), dismissing-avoidant versus fearful-avoidant, \(p = .02\)). In other words, people who were attached to G-d in a dismissing-avoidant way (low on ATG anxiety and high on ATG avoidance) showed more evidence of cognitive activation of the G-d schema than any other attachment groups. I conducted another ANOVA examining the effects of condition and attachment to G-d strength (as indicated by dichotomized total MAG scores) on lexical decision task difference scores. There was no
evidence of main or interactive effects of condition or between weak and strong ATG on G-d-schema activation (MAG Total $F[1, 143] = 1.59, p = .21, \eta^2_p = .01$; Condition $F[1, 143] = 0.25, p = .62, \eta^2_p < .01$; Interaction $F[1, 143] = 0.15, p = .70, \eta^2_p < .01$). In sum, I did not find support for hypotheses 6 through 8; although G-d attachment was related to tendency to seek out G-d, I had predicted that high ATG security and anxiety would be related to a tendency to seek out G-d, when in fact only high ATG avoidance was related to implicit G-d proximity-seeking.

**G-d Attachment Style and Explicit Turning to G-d.** In order to evaluate hypothesis 9, I examined correlations between the ATG variables (AGI anxiety, AGI avoidance, and MAG total scores) and the religious coping measures (RCOPE positive religious coping, RCOPE negative religious coping, and COPE religious coping techniques). All correlations are presented in Table 12. My hypothesis was supported. High AGI anxiety was associated with greater use of positive religious coping ($r = .26, p < .01$), as well as with negative religious coping ($r = .58, p < .01$). In contrast, high AGI avoidance was negatively correlated with positive religious coping ($r = -.75, p < .01$) and with general use of religious coping techniques ($r = -.69, p < .01$). Finally, MAG strength of attachment to G-d was positively correlated with positive religious coping ($r = .84, p < .01$) as well as general religious coping ($r = .71, p < .01$). Overall, people with a strong G-d attachment tended to use both positive religious coping and general religious coping; people with high ATG anxiety tended to use positive religious coping as well as negative religious coping; and people with high ATG avoidance reported using very little positive or general religious coping techniques.

**Study 2 Discussion**

Study 2 was designed to follow Study 1 by further exploring whether the association between lower anxiety and secure G-d attachment is accounted for by people turning to G-d
when threatened. I predicted that when individuals are experimentally stressed via an electric shock threat, they would seek out G-d if they were securely or anxiously attached, but would not seek out G-d if they were avoidantly attached. Results were in the opposite direction of my prediction: of the four attachment styles, subjects who were classified as dismissing-avoidant had greater cognitive accessibility to the G-d schema than all other attachment styles. There were no other differences between attachment styles in G-d accessibility. This occurred in both the stressful condition (when connected to an “electric shock” machine) and in the non-stressful condition (when connected to physiological recording equipment).

**Why Did those Avoidantly Attached Turn to G-d?** The primary results are, prima facie, unexpected. Yet, closer examination of the way in which I operationalized the construct of proximity-seeking reveals a possible explanation. Specifically, I measured whether individuals turned to G-d through the use of an implicit experimental technique that assesses whether certain concepts are more cognitively accessible than others (i.e., whether the participant thought of the target concept, either unconsciously or consciously). As revealed in the correlational analyses of self-report, people who are avoidantly attached to G-d deny turning to G-d on a conscious level when under stress. However, a number of theoretical and experimental studies have explored the idea that avoidant people may consciously suppress their attachment needs and feelings, but in fact unconsciously experience those attachment needs and attachment-triggered anxiety to an even greater extent than anxiously and securely attached individuals (e.g., Diamond, Hicks, & Otter-Henderson, 2006; Spangler & Grossman, 1993). This body of literature demonstrating that avoidant attachment relates to greater physiological and unconscious distress may be accounted for by the ineffectual deactivating strategies employed by avoidantly attached people and the increased tension and stress associated with the effortful repression of emotions (Dozier &
Kobak, 1992; Main, 1981). Given the evidence that avoidant attachment is related to worse emotion regulation and greater unconscious distress than secure or anxious attachment, it may be that the stress condition in the current study, which was designed to be somewhat stressful but still innocuous, was threatening enough to activate the attachment system in participants who were avoidantly attached but not in those who were securely or anxiously attached. Subjects who endorsed an avoidant attachment to G-d do seem to have experienced significant stress, even in the control condition that was designed to be relatively innocuous, and so they turned to G-d for support, albeit on an unconscious level.

**G-d Attachment Avoidance and Explicit Reporting.** The association between G-d attachment and self-report of turning to G-d served as a striking contrast to the pattern displayed when proximity-seeking was measured via an implicit measure. The correlations between measures of attachment to G-d and retrospective self-reports of techniques used when stressed were very much in line with my predictions (H9). People high on anxious attachment to G-d tended to turn to G-d under stressful circumstances, but as a reflection of their ambivalence, this took the form of both positive and negative religious coping methods (e.g., expressing anger towards G-d). When explicitly questioned about their tendency to seek out G-d when stressed, avoidant individuals denied any such tendency; avoidant G-d attachment was strongly negatively correlated with measures of positive religious coping and general religious coping. Corroborating these findings, overall strength of attachment to G-d was strongly positively correlated with self-reported use of both positive and general religious coping.

Integrating the results from both sets of Study 2 analyses yields an interesting view of the dynamic between G-d attachment dimensions and tendency to seek G-d when stressed. In situations that are perhaps not substantially anxiety-provoking, individuals with secure and
anxious G-d attachment do not seem to turn to G-d for support. However, via an implicit measure of G-d seeking, this study demonstrates that avoidantly attached individuals do seek out G-d on an unconscious level, even in a situation that is not substantially threatening. In marked contrast, when explicitly reporting on their usual coping mechanisms, avoidant individuals strongly deny turning to G-d, whereas securely attached individuals, as expected, report using positive religious coping techniques and turning to G-d when stressed. Furthermore, in a classic manifestation of the tug-of-war that is experienced by anxiously attached people, individuals who endorse an anxious attachment to G-d use both positive and negative religious coping methods to deal with stress.
Chapter 9: Study 3

Study 1 and Study 2 served to establish that individuals with a secure attachment to G-d tend to turn to G-d when they are threatened, and tend to be less anxious in general. Study 3 aimed to establish an experimental link between these two findings by examining whether turning to G-d leads to an immediate reduction in anxiety. Study 3 was a between-subjects experimental study. The independent variables were condition (G-d prime/no G-d prime) and attachment to G-d (secure/insecure). The dependent variable was reduction in anxiety, as measured physiologically and subjectively. In this study, all participants underwent a stress induction. They were then primed with either neutral concepts (control condition) or G-d concepts (experimental condition). Reductions in anxiety from pre to post-prime were assessed.

Method

Participants As in the first two studies, participants for Study 3 were recruited from the Queens College subject pool. Participants who indicated on a pre-screening measure that they believed “G-d definitely does not exist” or “G-d probably does not exist” were unable to sign up for the study. One hundred and thirty-four subjects from Introductory Psychology courses participated in Study 3 in exchange for course credit. Due to equipment malfunction, the majority of the data was missing for two participants, and they were excluded from the final analyses. Three participants chose to drop out of the study after being told that they would be shocked. This resulted in a final n of 129 (60.5% female). The mean age for the final sample was 22.50 (SD = 7.50, range = 17 – 58). The ethnic breakdown was as follows: 34.9% White, 19.4%

8 Since it is difficult to “force” participants to turn to G-d, I chose to prime participants with a G-d concept to induce a state closely resembling that of “turning to G-d.” It should be understood that whenever the term “turning to G-d” is used in reference to Study 3, it refers to priming participants with the G-d concept.
Hispanic, 19.4% East Asian, 11.6% Asian-Indian, 7% Black, and 7% “Other” (e.g., Filipino, Middle Eastern, etc.). The religious breakdown was as follows: 50.4% Christian, 14.7% Jewish, 14% non-religious believers, 10.9% Muslim, 3.9% Hindu, 3.9% Buddhist, 1.6% atheistic, and 0.8% agnostic.

Measures and Materials. Many of the same measures and materials that were used in Studies 1-2 were used in Study 3.

Experimental Induction

Stress Induction. The stress induction used in Study 3 was identical to the stress induction used in Study 2. The only difference was that participants were attached to an electric shock stimulator (Grass Technologies SD-9 Square Pulse Stimulator) rather than to a bioamplifier (since the bioamplifier was in use to record physiological data).

Independent Variables

1) Scrambled Sentences Task. There was an experimental (G-d) and control (neutral) prime. In order to prime subjects with the concept of G-d, effectively “forcing” them to seek proximity to G-d, I administered a scrambled sentence task (SST; Srull & Wyer, 1979). This task requires respondents to unscramble sentences; a target prime (i.e., the concept that is being primed) is embedded in the sentences, which implicitly primes respondents with that concept. I used the SST designed by Shariff and Norenzayan (2007) to prime participants with G-d concepts. Participants were presented with ten five-word scrambled sentences and told “Unscramble the following groups of words to make a four-word phrase or sentence by dropping the irrelevant word.” In the experimental group, five of the ten sentences contained no coherent theme while the other five sentences contained words associated with G-d (e.g., “sacred was book refer the”  \(\rightarrow\) “The book was sacred”). In the control condition, there is no coherent theme
or concept among the ten sentences (e.g., “shoes give replace old the” \(\rightarrow\) “Replace the old shoes”).

2) Attachment to G-d. Attachment to G-d was assessed using the same measures used in Studies 1 and 2 (the AGI and the MAG).

Dependent Variables

1) Physiological Measurements. Heart rate (i.e., an electrocardiogram, ECG) and skin conductance level (SCL) were recorded during the experiment in order to assess anxiety as demonstrated through physiological changes. I used an SA Isolated Instrumentation Bioamplifier machine (James Long Company) and physiological recording equipment from the same company to measure ECG and SCR (gathered at 10 samples per second). Physiological data was measured during three three-minute epochs: a three-minute baseline period, three minutes post-stress (immediately following the stress induction), and three minutes post-prime (immediately following the priming condition). The mean ECG and SCL were obtained for each 3-minute epoch. Higher heart rate and higher skin conductance level can be interpreted as indicative of higher arousal and therefore of greater tension, stress, and anxiety (Cacioppo, Tassinary, & Berntson, 2007). The outcome measures of interest were the reductions in anxiety from the post-stress period to the post-prime period, and were calculated by subtracting the post-prime mean ECG / SCL from the post-stress mean. Higher numbers indicated a greater reduction in anxiety.

2) Visual Analogue Scale. I obtained a subjective measure of felt anxiety by administering a visual analogue scale (VAS). The VAS was administered on the computer using a software program called Adaptive Visual Analog Scales (AVAS; Marsh-Richard, Hatzis, Mathias, Venditti, & Dougherty, 2009). Participants were presented with a horizontal line on the computer screen with the anchors ‘not at all [x emotion]’ and ‘extremely [x emotion],’ and were
instructed to put a mark on the line indicating “how you are feeling RIGHT NOW.” As per Robinson, Letkiewicz, Overstreet, Ernst, and Grillon (2011), I presented three items: anxious, happy, and afraid. For the purposes of my study, I was interested in the reduction in felt anxiety between the post-stress period and the post-prime period; a difference score was calculated to measure this reduction. Higher numbers indicated a greater reduction in anxiety.

Procedures. Participants signed up for Study 3 after viewing a brief description of the study. This description, like the consent form, did not specify the exact procedures that would be used in the research (since the nature of the stress induction required that it be unexpected). The study was administered to one participant at a time. Each participant was randomly assigned to either the G-d prime (experimental) condition or the neutral prime (control) condition. After signing a consent form, participants were attached to physiological recording equipment, which measured their heart rate and skin conductance. To obtain baseline physiological data, participants sat alone in the experimental room for three minutes while listening to relaxing music (Weinstein, on Champagne and Roses: The Songs of Carole King, 1995). The music was then discontinued, and the stress induction was administered. The experimenter attached the participant to an electric shock stimulator and said “Shortly, you are going to be exposed to a situation and set of experimental procedures that typically arouse considerable anxiety and distress in most people. Through these electrodes, you will be given several electrical shocks over the course of the study. There’s no risk of permanent physical harm, but you may experience some pain. Before we begin the shock sequence, we need to finish setting up the equipment in the other room.” The experimenter left the room and moved some equipment around in the adjacent room while the participant’s post-stress induction physiological data was recorded for three minutes. After three minutes, the experimenter returned to the experimental
room and explained that since the electric shock equipment was “taking a while to boot up,” the next part of the experiment would be administered in the meantime. The experimenter administered the post-stress visual analogue scale on the computer and then gave the participant a paper copy of the scrambled sentences task to complete (either the experimental G-d prime task, or the control neutral task, depending on the condition). After completing these tasks, the participant was asked to wait a few more minutes while the equipment “finishes booting up.” While the participant sat alone in the experimental room, post-prime physiological data was recorded for three minutes. A second, post-prime VAS was then administered. Once this was completed, the experimenter stopped the physiological data recording, re-entered the experimental room and stated that “Unfortunately, the electrical equipment is malfunctioning, so we won’t be able to do the electric shock part of the experiment.” The experimenter unhooked the participant from the electric shock stimulator and then administered the questionnaire part of the experiment (i.e., ATG measures, confounding variables, and demographics) on the computer through SurveyMonkey. A manipulation check and suspicion probe were performed to ascertain whether participants were suspicious of the purpose of the study, whether they were aware of the G-d prime in the SST, and whether they believed that they would be shocked.\(^9\) Participants were then fully debriefed and informed of the methods and purpose of the study, and asked to sign a

\(^9\) Eight participants reported some awareness of the purpose of the study, 8 different participants reported being aware that the SST involved religious words, and a third group of 8 participants reported not believing that they would be shocked. Due to the small numbers in these groups and unequal sample sizes, analyses of group differences between the rest of the participants and those with suspicions were not performed.
post-debriefing consent form indicating if they still consented to the use of their data\textsuperscript{10}. After the debriefing, participants were unhooked from the physiological recording equipment.

\textit{Study 3 Results}

Descriptive statistics and alphas for all measures are reported in Table 13. Internal consistency for measures used in this study ranged from acceptable to good.

Factorial analyses of variance, hierarchical multiple regression, and correlational analyses were utilized to examine Study 3 hypotheses. The predictors for most analyses included attachment to G-d (as measured by AGI and MAG scores) and experimental condition (G-d prime versus neutral prime). The outcome measures, depending on the analysis, included the anxiety measures in the post-stress period and the difference scores between post-stress and post-prime. Difference scores between the post-stress induction epoch and the post-prime epoch were calculated for heart rate (HR; as measured by an electrocardiogram, ECG), skin conductance level (SCL), and subjectively reported anxiety (as measured by the AVAS).

Given that the general purpose of Study 3 was to ascertain whether individuals who are securely attached to G-d will experience a reduction in anxiety when they are primed with a G-d association, my primary hypothesis was that anxiety reduction in response to a G-d prime would be greater for those securely attached to G-d than for those insecurely attached to G-d (H10). In contrast, I expected that high G-d attachment anxiety (H11) and high ATG avoidance (H12) would be unrelated to anxiety reduction following a G-d prime. I also predicted that secure G-d attachment would predict a greater reduction in anxiety in the control condition as well (H13).

\textbf{G-d Attachment Security/ Strength and the Calming Response.} I first evaluated whether individuals who are securely attached to G-d would react to a G-d prime with greater

\textsuperscript{10} All participants consented to the use of their data at the post-debriefing time.
reductions in anxiety than individuals who are insecurely attached to G-d (H10). To differentiate between securely and insecurely attached individuals, I performed a median split on the AGI avoidance and AGI anxiety variables. Subjects who scored low on both variables were classified as secure in their G-d attachment, while subjects who scored high on either one or both of the variables were classified as insecure. I conducted factorial analyses of variance (ANOVA) assessing the effect of condition (G-d prime versus neutral prime), G-d attachment security, and the interaction of these two variables on the three anxiety difference scores. Levene’s test of equality of error variances was non-significant for all three ANOVAs, indicating that the assumption of homogeneity of variances between groups was met.

There were no main effects of condition and attachment security on AVAS difference scores, but the interaction of attachment security and condition predicted variability in AVAS difference scores, $F(1,125) = 4.66, p = .03$ (see Table 14 for all results). As illustrated by a plot of the interaction (Figure 2), individuals who were securely attached to G-d reported somewhat (marginally significant) greater anxiety reduction in the G-d prime condition ($M = 9.19, SD = 5.33$) than in the neutral prime condition ($M = -4.31, SD = .46$), $F(1,26) = 3.71, p = .07$, whereas insecurely attached individuals reported similar anxiety reductions in both conditions (G-d prime $M = 3.94, SD = 2.51$; neutral prime $M = 7.62, SD = 3.94$), $F(1,99) = .99, p = .32$. This supports my hypothesis that subjects with secure G-d attachment would experience greater stress relief from a G-d prime than insecurely attached individuals. The ANOVAs examining the effect of condition and ATG security on heart rate and on skin conductance level were all non-significant (see Tables 15-16 for results).

To further examine the effects of attachment security on anxiety reduction (hypotheses H10-H13), I conducted nine hierarchical regression analyses using condition (G-d prime versus
neutral prime) and attachment to G-d as predictors of the anxiety pre- and post-prime difference scores. All predictor variables were mean-centered (Aiken & West, 1991). Tests for multicollinearity indicated that all independent variables were sufficiently independent (Tolerance statistics > 0.1). The hierarchical multiple regressions were two-step models. In all regressions, condition (i.e., being primed with G-d versus neutral scrambled sentences) and attachment to G-d (as measured by AGI anxiety, AGI avoidance, or MAG overall total score) were entered in the first step. The second step included the multiplicative interaction term assessing whether the effect of condition varied as a function of attachment to G-d. Nine separate regressions were conducted to assess the effect of the three different ATG measures on the three difference score outcomes.

The first set of regressions further examined the effect of secure G-d attachment as well as G-d attachment strength on anxiety reduction (hypothesis 10). The MAG score (i.e., strength of attachment to G-d) did not predict variability in AVAS or ECG difference scores (see Tables 17-18 for all values). However, strength of attachment to G-d predicted differences in SCL scores (see Table 19). When I regressed SCL difference scores on condition and MAG scores, the interaction of condition and MAG predicted SCL differences, \( R^2 = .07, R^2_{adj} = .05, F(3, 102) = 2.73, p = .05 \). To interpret the interaction, a new variable was created representing high MAG scores (1 standard deviation above the mean) or low MAG scores (1 standard deviation below the mean). A plot of the interaction term with the low and high MAG groups revealed that while strong attachment to G-d did not predict SCL differences as a function of condition (\( \beta = -.18, t = -.76, p = .46 \)), weak ATG did predict differences in SCL, \( \beta = .48, t = 2.11, p = .05 \). Condition had an opposing effect dependent on the level of ATG strength, such that those with high ATG showed no difference in SCL reduction between conditions but those with low ATG had greater
reductions in SCL when primed with a G-d prime than when primed with a neutral prime (see Figure 3). This association is the converse of what hypothesis 10 predicted, as individuals with stronger attachment to G-d were less affected by the G-d prime than those with weaker attachment to G-d. However, notably, when examining SCL differences between conditions in the high MAG group alone, there was no difference between the control group and the prime group, \( t(18) = .76, p = .46 \). This implies that those with strong ATG calmed down even without being primed with G-d. On the other hand, in the weak MAG group alone, condition did have an effect on SCL differences: the reduction in skin conductance level was higher when weakly attached people were primed with the idea of G-d (\( M = -1.08, SD = 1.60 \)) than when weakly attached people did not experience any G-d prime (\( M = -3.87, SD = 3.75 \)), \( t(15) = -2.11, p = .05 \).

To clarify the meaning of this unexpected finding, I further examined the makeup of the group with weak attachment to G-d. Individuals who scored low on the MAG scale would include those with no relationship with G-d but might also include those with strong G-d attachment avoidance. Corroborating this, an independent measures t-test analyzing the effect of low or high MAG scores on G-d attachment avoidance demonstrated that mean G-d attachment avoidance was significantly higher in the low MAG group (\( M = 73.40, SD = 9.68 \)) than in the high MAG group (\( M = 31.21, SD = 31.21 \)), \( t(42) = 13.48, p = .01 \). Thus, it follows that the low MAG and the high ATG avoidance groups closely overlap, and people with high ATG avoidance tend to be more likely to calm down (as measured by skin conductance) when they are primed with the concept of G-d.

In sum, ANOVAs examining the interaction of secure attachment and condition on physiological and self-reported anxiety partially supported my hypothesis: there was a marginally significant effect such that people with secure attachment versus insecure attachment
reported greater anxiety reductions after being primed with G-d than after being primed with a neutral concept. However, contrary to my hypothesis, regressing the anxiety outcomes on the different attachment variables demonstrated that people with strong G-d attachment benefited less from being primed with G-d than people with weak G-d attachment (perhaps because those with strong G-d attachment were able to calm themselves down even without the G-d prime).

**G-d Attachment Anxiety and the Calming Response.** In terms of ATG anxiety, which I predicted would be unrelated to anxiety reduction as a function of the prime (hypothesis 11), I found an effect when regressing AVAS (self-reported anxiety reduction) on ATG anxiety and condition (see Table 20). Specifically, the interaction of condition and ATG anxiety predicted differences in self-reported anxiety \( (p = .04) \). A plot of this interaction (using AGI Anxiety scores dichotomized into high and low ATG anxiety by one standard deviation above or below the mean) suggests that the effect of the experimental prime on self-reported anxiety reduction was dependent on the level of ATG anxiety such that people with high ATG anxiety did not show AVAS differences \( (\beta = -.27, t = -1.09, p = .29) \), but individuals with low ATG anxiety experienced greater anxiety reductions when primed with G-d than when primed with a neutral prime, \( \beta = .46, t = 2.51, p = .02 \) (see Figure 4). ATG anxiety did not significantly predict any other anxiety reduction outcomes as indicated by ECG or SCL changes (see Tables 21-22). These results provide further support for hypothesis 10: as predicted, people with low ATG anxiety (i.e., secure G-d attachment) had greater reductions in anxiety as a function of being primed with G-d, while high ATG anxiety was unrelated to reductions in anxiety. In terms of hypothesis 11, these results weren’t in line with my prediction that G-d attachment anxiety would be unrelated to anxiety reduction. However, notably, high ATG anxiety was unrelated to
anxiety reduction, and only low ATG anxiety (which is part of secure G-d attachment) was related.

**G-d Attachment Avoidance and the Calming Response.** I predicted that ATG avoidance would be unrelated to reductions in general anxiety as a function of the experimental prime (hypothesis 12). All three regressions examining the interaction of ATG avoidance and condition in predicting differences in AVAS, ECG, and SCL anxiety were indeed not significant, supporting my hypothesis (see Tables 23-25 for all values).

**G-d Attachment Security / Strength and Lower General Anxiety.** I further predicted that individuals with secure attachment to G-d would experience greater reductions in anxiety in the control condition as well as in the experimental condition (H13), as they may tend to turn to G-d of their own accord and therefore experience a reduction in anxiety. Analyses of this hypothesis produced mixed results. I examined the two-tailed Pearson bivariate correlations between attachment to G-d (the AGI and the MAG variables) and the outcome measures (reductions in AVAS, ECG, and SCL anxiety) among participants in the control condition only, and found that MAG and SCL differences were correlated such that strong G-d attachment was associated with greater reductions in SCL, $r = .38, p < .05$ (Table 26). Thus, this finding suggests that those with strong attachment to G-d are better equipped to calm themselves down, on an unconscious level. I also ran one-way analyses of variance on subjects in the control condition examining the effect of secure G-d attachment (i.e., scoring low on both AGI variables; see above) on the three outcome measures. ATG security affected AVAS differences in self-reported anxiety such that when exposed to a neutral prime, individuals who were classified as insecurely attached to G-d experienced significantly greater reductions in self-reported anxiety than individuals who were securely attached to G-d, $F(1, 61) = 5.85, p = .02$. However, more careful
scrutiny of this finding demonstrated that it was driven by significantly higher post-stress anxiety levels in the insecurely attached group. Selecting only individuals in the control group, I ran an independent-measures t-test examining the effect of attachment security on AVAS self-reported anxiety immediately following the stress induction. Variances were unequal, so I examined the corrected t-test that did not assume equal variances. People with insecure G-d attachment had higher scores on the AVAS self-reported anxiety measure immediately following the electric shock threat ($M = 37.69, SD = 26.96$) than people with secure G-d attachment ($M = 15.63, SD = 16.82$), $t (42.2) = 3.83, p < .01$. Another t-test examining the effect of attachment security on self-reported anxiety following the neutral prime was not significant, $t (61) = 1.35, p = .18$. Thus, it appears the reason insecurely attached individuals demonstrated a greater reduction in anxiety was due to their extremely high initial anxiety levels, and not due to greater anxiety in the secure group.

Study 3 Discussion

Study 3 was designed to extend Studies 1 and 2 by demonstrating that people with secure G-d attachment are indeed soothed when they turn to G-d. I expected that securely attached individuals would show a greater reduction in anxiety than insecurely attached subjects after being directed to turn to G-d by being primed with G-d.

Secure G-d Attachment: Do They Calm Down? The primary hypothesis (H10) was partially supported in that the interaction of attachment security and experimental condition predicted self-reported reduction in anxiety. Individuals classified as high in G-d attachment security reported a greater reduction in anxiety after being given a G-d prime than after being given a neutral prime; insecure individuals showed no difference in anxiety reduction. As predicted, turning to G-d did have a soothing effect on people with secure G-d attachment.
Analyses using a different measure of attachment to G-d were less clear-cut. Regressing skin conductance differences on strength of attachment to G-d and condition yielded counterintuitive results. Overall, strong attachment to G-d predicted greater skin conductance reduction, but strong G-d attachment had the same effect regardless of condition, while subjects who reported a weak G-d attachment experienced a greater reduction in the G-d condition than in the neutral condition (see Figure 3). Analysis of this interaction suggests that people who were strongly attached to G-d turned to G-d when stressed of their own accord, without being primed, and thus derived significant anxiolytic benefits; therefore, they showed no difference in anxiety levels when they were encouraged to turn to G-d through the use of G-d priming. However, people with weak attachment to G-d did not turn to Him in the control condition, thus experiencing substantially greater anxiety in the control condition than subjects with strong G-d attachment. These same individuals did experience substantial benefit when primed with G-d, as indicated by greater reduction of skin conductance levels in the prime condition than in the control condition.

One potential explanation for why those with weak G-d attachment might still respond to a G-d prime with greater reductions in anxiety relates to the nature of the MAG measure, and to the fact that this association was only evident with an unconscious measure of anxiety reduction. The group of individuals who scored low on the MAG scale also endorsed very high G-d attachment avoidance. Some types of G-d attachment avoidance are linked to heightened attachment system activity even in the absence of acknowledged attachment functions. Subjects in the low MAG group who were avoidantly attached would not endorse self-reported anxiety reductions in response to a G-d prime, but may have reacted on an unconscious and physiological level to the G-d prime by calming down.
**Anxious G-d Attachment: Do They Calm Down?** Because of the ambivalence that is evident in people who are anxiously attached, I predicted that attachment anxiety would have little to no association with the anxiety reduction measures (H11). As expected, most analyses examining the interaction between attachment to G-d anxiety and the condition on the anxiety reduction outcomes showed no effects. One interaction of the effects of ATG anxiety and condition on subjectively reported anxiety reduction was noted. However, examination of this interaction provided further support for my predictions that secure G-d attachment would be affected by the G-d prime but anxious G-d attachment would not: low ATG anxiety (i.e., secure G-d attachment) predicted greater reductions in anxiety as a function of being primed with the concept of G-d, while high ATG anxiety was unrelated (see Figure 4).

**Avoidant G-d Attachment: Do They Calm Down?** Since attachment avoidance corresponds to a view of one’s attachment figure as unsupportive and therefore not soothing, I predicted that individuals with high G-d attachment avoidance would not experience a greater reduction in anxiety effect after the G-d prime (H12). Examinations of the effect of ATG avoidance and condition in predicting the three anxiety reductions variables supported this hypothesis: none were significant. However, it should be noted that the low ATG strength group, which demonstrated significantly high ATG avoidance, did experience greater reductions in skin conductance after being primed with G-d and thus did derive some unconscious anxiety reduction benefit from being primed with G-d.

**G-d Attachment Style in the Control Condition.** I also hypothesized that just as secure G-d attachment was inversely related to a range of anxiety measures in Study 1, Study 3 subjects with secure G-d attachment would demonstrate lower anxiety (i.e., higher anxiety reduction scores) in the control condition. Tests of this hypothesis were mixed. In the control condition
only, people with stronger attachment to G-d (MAG scores) tended to experience greater reductions in skin conductance level. However, the effect of secure attachment in the control group on anxiety reduction seemed to occur in the opposite direction. People with insecure attachment to G-d demonstrated greater reductions in self-reported anxiety than people who were securely attached. This would seem to contradict my hypothesis that individuals with secure G-d attachment are generally less anxious. However, further examination of this finding revealed that individuals with secure G-d attachment were less anxious after being threatened in the control condition; the reason insecurely attached individuals demonstrated greater reductions in anxiety was due to their significantly higher initial anxiety. This provides further support for my main thesis tested in Study 1; secure attachment to G-d served as a buffer against the experience of extreme anxiety in an anxiety-provoking situation.

**Skin Conductance Level versus Heart Rate.** Notably, while the outcome measures of subjective anxiety ratings and skin conductance level both yielded several significant results, no findings were uncovered using the outcome measure of heart rate. This may be due to the relative utility of heart rate versus skin conductance as a measure of anxiety. There is some evidence to suggest that heart rate is more responsive during active avoidance behavior, while skin conductance is primarily reactive to situations that elicit anxiety and are inescapable (Cacioppo et al., 2007). Thus, skin conductance is thought to reflect more of an anxiety system per se, suggesting that it was a more accurate assessment of the anxiety response in my study than heart rate.
Chapter 10: General Discussion

My findings support the unique role of attachment to G-d in relieving anxiety and stress, as well as the attachment-based manner in which the relief is extended. G-d attachment accounted for variance in stress, anxiety, depression, and neuroticism over and above the variability accounted for by other religious constructs (Study 1). Secure and strong G-d attachment was associated with lower psychopathology, high G-d attachment anxiety was related to high general anxiety, and G-d attachment avoidance was unrelated to any self-reported psychopathology (Study 1).

I hypothesized that this process might work through the safe haven attachment function; that is, securely attached people might turn to G-d on a regular situational basis when threatened. An experimental test of the process did not support my thesis: on an implicit measure testing whether individuals sought G-d on an unconscious basis, only highly avoidant people sought out G-d when threatened (Study 2). However, self-reported data from the same subjects showed a very different picture. On a retrospective self-report measure of tendency to seek out G-d when stressed, individual with high G-d attachment avoidance were less likely to report the use of positive and general religious coping; those with high G-d attachment anxiety reported frequent use of both positive and negative religious coping; and overall strength of G-d attachment was positively correlated with the use of positive and general religious coping (Study 2).

To further explore the process underlying the association between secure G-d attachment and lower anxiety, I looked at whether experimentally inducing people to turn to G-d would lower their anxiety levels, differentially based on their attachment to G-d style. After being threatened with an electric shock and then primed with G-d concepts, participants who were securely attached to G-d demonstrated a greater reduction in self-reported general anxiety than
did participants who were insecurely attached to G-d (Study 3). Similarly, low G-d attachment anxiety predicted greater self-reported general anxiety reductions following the G-d prime. G-d attachment avoidance was unrelated to reductions in anxiety following the G-d prime. On the other hand, people with weak G-d attachment showed greater skin conductance reduction between the control and G-d prime condition than people with strong G-d attachment; this seemed to be driven by the fact that individuals with strong G-d attachment experienced a high reduction in skin conductance levels in both the control and the G-d priming condition. Similarly, in the control condition, without being induced to turn to G-d following a threat, strength of attachment to G-d was correlated with greater reductions in skin conductance anxiety levels. In this same condition individuals who were insecurely attached to G-d reported greater reductions in anxiety than individuals who were securely attached to G-d, but this effect was driven by significantly greater initial anxiety levels in the insecurely attached individuals, supporting my thesis that individuals with secure G-d attachment are generally less anxious and calmer (Study 3).

An additional question I aimed to clarify was why findings on the intersection of religion and anxiety have been mixed: I theorized that perhaps the wide range of both positive and negative aspects of religion accounts for the inconclusive evidence. By including a variety of religious constructs, I found support for this hypothesis (Study 1). The more positive, beneficial religious variables (including high intrinsic religiosity, frequent attendance at religious services, frequent private religious worship, strong belief in G-d, belief in an afterlife, trust in G-d, religious support received, and anticipated religious support) were all associated with lower psychopathology. Conversely, mistrust in G-d and negative religious coping were correlated with stress, anxiety, depression, trait anxiety, and neuroticism.
Last, I predicted that of the different general anxiety outcomes, the strongest association would be between secure G-d attachment and trait or manifest anxiety. I reasoned that the G-d attachment bond logically relates to anxiety based on the safe haven function and the omnipresent nature of G-d: people with secure G-d attachment can continuously turn to G-d when stressed, and this repeated anxiety-calming function would lead to lower trait anxiety over time. However, although G-d attachment was related to trait anxiety, it was unrelated to manifest anxiety, and there were stronger correlations with other anxiety variables such as recently experienced anxiety and overall perceived stress (Study 1). This suggests that while one of the benefits derived from secure G-d attachment may be lower trait anxiety, other related general anxiety outcomes are more palpable.

G-d Attachment, Religion, and Psychopathology

The body of research on the relationship between religion and mental health is growing exponentially, but the exact nature of the associations, particularly between religion and anxiety, remains inconclusive. There is ample evidence to suggest that the reason for the mixed findings is due to multiple definitions for “religiosity” as well as multiple ways of defining mental health (e.g., Rosmarin, Bigda-Peyton, Kertz, Smith, Rauch, & Bjorgvinsson, 2013). In fact, a meta-analysis that tested this by separating manuscripts according to their general definitions of religiosity and of mental health found differential findings for the link between religion and mental health based on the various definitions of each (Hackney & Sanders, 2003). Unfortunately, most projects testing the association of religion and mental health have included only one or two religious constructs, or three or four at best (e.g., Ellison et al., 2009). I attempted to further clarify the inconclusive literature by examining a theory-based inclusive range of religious constructs in one sample. I hypothesized that attachment to G-d would be of
primary importance in predicting lower anxiety, but that other religious variables would relate to
anxiety depending on whether they were more positive or more negative. I found support for
both these hypotheses, providing further evidence that the inconclusive literature is due to a lack
of consensus on the definition of religion.

Including a range of variables in the same study made it possible to directly and more
confidently compare the influence of different religious variables. Attachment to G-d,
particularly attachment to G-d anxiety and strength of attachment, was more strongly correlated
with the psychopathology measures than almost any other religious variable (with the exception
of negative religious coping). Even more notably, the addition of attachment to G-d to the other
religious variables incrementally improved prediction of perceived stress, neuroticism, trait
anxiety, and stress, anxiety, and depression experienced in the past week. In fact, after adding G-
d attachment to the other religious variables, all non-ATG variables dropped to non-significance
in predicting perceived stress and neuroticism. Religious variables were correlated with general
anxiety, stress, depression, and neuroticism along the lines that I predicted: higher levels of the
more positive constructs (e.g., intrinsic religiosity, trust in G-d) were related to lower levels of
psychopathology, while more negative constructs (e.g., mistrust in G-d, negative religious
coping) were positively correlated with the mental health problems. Sin belief, religious support
provided, negative religious interactions, and positive religious coping were all unrelated to the
mental health outcomes.

Past research has shown that the use of positive religious coping is predictive of greater
mental health and better treatment outcomes, whereas the use of negative religious coping
predicts poor psychiatric outcomes and reduced mental health (e.g., Carleton et al., 2008;
Rosmarin, Bigda-Peyton, Ongur, Pargament, & Bjorgtvinsson, 2013). In fact, using slightly
different measures of attachment to G-d and religious coping, Belavich and Pargament (2002) found partial support for a model predicting that the link between G-d attachment style and positive mental health outcomes is mediated by religious coping style. However, my findings suggest the opposite: that the relationship between religious coping and mental health outcomes may be subsumed in the relationship between attachment to G-d and mental health outcomes. In both Studies 1 and 2, G-d attachment style and religious coping style were strongly correlated. Conceptually as well, religious coping style is clearly related to the G-d attachment styles (i.e., when stressed, a person who is securely attached to G-d will “seek G-d’s love and care”; a person who is anxiously attached to G-d might “question the power of G-d”). However, in Study 1, use of negative religious coping predicted almost all of the negative outcome measures but dropped to non-significance with the addition of attachment to G-d; use of positive religious coping also dropped to non-significance in predicting manifest anxiety after G-d attachment was added. Given my results and given that attachment to G-d as a construct encompasses coping style in addition to other facets, it is likely that of the two constructs, attachment to G-d is of primary importance in predicting lower psychopathology.

*Who Seeks G-d when Threatened?*

As the first step towards corroborating the process through which secure G-d attachment relates to lower anxiety, I tested whether those who are securely attached to G-d are more likely to turn to Him when stressed. I hypothesized that people with secure G-d attachment are less generally anxious because they have access to an omnipresent, safe attachment figure, to Whom they turn on a regular basis for calming support. Study 2 tested this behavior using experimental, implicit methods as well as retrospective self-report. To bolster the chances of accurate reporting, I asked people to pinpoint a specific recent stressor and then identify their methods of
coping with the stressor (in addition to completing a measure of general coping tools). Self-reported turning to G-d divided along typical attachment pattern categories. People who were strongly attached to G-d reported using more positive religious coping techniques when stressed. G-d attachment anxiety was associated with using more positive and negative religious coping techniques, reflecting the ambivalence of the anxious attachment relationship. However, those with high G-d attachment avoidance reported using very few religious or positive religious coping techniques to deal with stress; that is, they deny turning to G-d when stressed. These results are typical of the body of research investigating self-reported seeking of G-d as a function of attachment to G-d (e.g., Belavich & Pargament, 2002; Bonab & Namini, 2010).

The self-reported turning to G-d contrasted sharply with the data measuring who turned to G-d on an unconscious level: after being threatened with an electric shock, the group who turned to G-d included those with high G-d attachment avoidance. These contradictory results in the same individuals serve to deepen the contrast between what avoidantly attached individuals report and experience. On a conscious level, avoidantly attached people tend to deactivate attachment strategies and deny the presence of attachment schemas. However, on an unconscious and repressed level, they often do employ attachment strategies and experience attachment-related responses (e.g., Diamond et al., 2006).

People with secure attachment to G-d reported turning to G-d when stressed, but showed no evidence of doing so on an experimental, real-time measure. In contrast, individuals with avoidant attachment who denied turning to G-d did demonstrate an unconscious awareness of G-d following a threat. The avoidance findings are in line with the repressed attachment strategies associated with avoidance (see above). However, based on the tendency of securely attached people to turn to their attachment figure for support, it was somewhat surprising that the same
securely G-d attached individuals who reported turning to G-d to deal with past stressors did not show evidence of doing so when threatened. The answer seems to be related to a lower stress threshold among avoidantly attached individuals and the higher implicit stress responses demonstrated by avoidantly attached individuals. There is a preponderance of research demonstrating that while avoidantly attached people may overtly suppress attachment responses, they experience greater acute and long-term stress responses than securely attached people, as measured by heart rate, skin conductance, cortisol levels, and autoimmune functioning (Diamond et al., 2006; Picardi et al., 2013; Spangler & Grossman, 1993). The stress paradigm that I used was likely not stressful enough to provoke a high level of anxiety in the securely attached group (who were already shown to be generally less anxious in Study 1). In fact, for adults in general, the attachment system is only fully activated when the adult is in a situation of extreme stress or danger (Kirkpatrick, 2005). Although this may have been the case for the stressful life events that the securely attached people reported, in my manipulated stressful situation, securely attached people may not have felt threatened and so did not feel the need to turn to G-d. Avoidantly attached people, who experience more unconscious or physiological stress, may have explicitly denied feeling threatened, but did feel afraid enough to turn towards G-d (albeit on an unconscious level). This explanation could not be directly tested in Study 2 because I did not measure anxiety levels following the stress, but Study 3 data lend support. The same stress paradigm (threatening with electric shocks) in the same population (urban American undergraduate college students) was used in Studies 2 and 3, as well as the same attachment measures. In Study 3, the only attachment measure that correlated with an implicit measure of anxiety immediately following the threat was G-d attachment avoidance, which was associated with a higher heart rate \( r = .24, p < .05 \). This implies that on a physiological, unbiased basis,
those with G-d attachment avoidance were most strongly affected and became most fearful as a result of the stress paradigm. Therefore, they turned to G-d, on an unconscious level. These findings are not sufficient to rule out the possibility that those with secure G-d attachment would also have turned to Him for comfort, since their self-report measures did corroborate my prediction of safe-haven seeking behavior. Rather, a similar experimental paradigm that invokes more threat would be needed to test the real-time response of securely attached people who feel threatened.

There are very few papers that have experimentally examined how attachment security moderates whether people turn to G-d when threatened. Those projects that have examined this question have used general interpersonal attachment rather than specifically G-d attachment as a moderator of the response to stress (Richert & Granqvist, 2013). Two studies that have experimentally tested whether threatened people turn to G-d have found that avoidantly attached people either do not turn towards G-d at all (Birgegard & Granqvist, 2004) or do turn towards G-d, but do so to a lesser extent than securely and anxiously attached individuals (Granqvist et al., 2012). However, both of these studies measured interpersonal attachment, not G-d attachment specifically, as the moderator of the response. In addition, one of the papers (Birgegard & Granqvist, 2004) assessed “turning to G-d” via explicit self-report, and both used subliminal priming rather than explicit situations to induce feelings of threat. Attachment behavior and the effect of stress priming differ dramatically based on whether explicit or implicit measures are used (Hall, Fujikawa, Halcrow, Hill, & Delaney, 2009; Mikulincer, Shaver, & Rom, 2011). Given the differences in type of attachment and methodology, it is perhaps not surprising that my findings differed from these previous studies.

G-d Attachment Security, Strength, and General Anxiety
A key component of attachment theory is that security with an attachment figure leads to low acute and chronic anxiety (Bowlby, 1973). I predicted that G-d, as an omnipresent attachment figure, would serve as a buffer against anxiety for those securely attached to Him. This hypothesis was tested in two of my studies: Study 1 examined this prediction using correlational self-report methods to study chronic and general anxiety, while Study 3 involved experimental methods testing acute anxiety.

When retrospectively reporting about their chronic anxiety, stress, depression, and neuroticism, my prediction was generally confirmed. In Study 1, high attachment anxiety was correlated with perceived stress, trait anxiety, recently experienced stress, anxiety, and depression, and trait neuroticism. Attachment avoidance was uncorrelated with any of the self-reported psychopathology measures. Strength of attachment was negatively correlated with depression and neuroticism. These associations are similar to those reported in the majority of the literature regarding G-d attachment or general attachment and psychopathology (e.g., Shorey & Snyder, 2006).

There is limited empirical research on acute stress and anxiety response when an attachment figure is present. This is particularly true when the attachment figure in question is G-d. Examining the safe haven response with the use of G-d as the calming attachment figure has the marked advantage of controlling for the attachment figure’s behavior, since presumably a person’s perception (i.e., secure or insecure) of G-d is the only factor influencing their response. In Study 3, I examined whether invoking G-d’s presence (through an implicit task) would effectively allow securely attached individuals to relax following a threat. Measures of anxiety reduction included both self-report and physiological data (which served as a less biased assessment of the calming effects). I predicted that people with secure attachment to G-d would
experience generally lower anxiety and greater anxiety reductions than those with insecure attachment, particularly when they were primed with the reminder of G-d. My prediction was supported, though not for every outcome measure. On a measure of subjective self-reported anxiety, those individuals high on attachment security reported greater reductions in anxiety after being primed with G-d than after being primed with a neutral concept, while insecurely attached individuals did not report a greater anxiety reduction as a function of turning to G-d. Similarly, low G-d attachment anxiety was related to greater reductions in self-reported anxiety following a G-d prime than following a neutral prime. Finally, immediately following the stress induction, self-reported anxiety levels were higher for people with insecure G-d attachment than for those with secure G-d attachment. However, when skin conductance level was assessed as a measure of anxiety, the picture looked slightly different. People with a weak attachment to G-d tended to be positively impacted by a reminder of G-d, and showed greater reductions in skin conductance level after being reminded of G-d. Individuals with a strong attachment to G-d did not seem to be affected on the implicit, physiological level (i.e., skin conductance) by reminders of G-d, and this appeared to be because they had preemptively soothed themselves – they were able to calm themselves down in the control condition as well.

Several findings here are notable. One clinically significant implication is the anxiolytic benefit of secure G-d attachment, as attested to by lower physiological anxiety levels, even without necessarily invoking the presence of the attachment figure. In other words, even without the aid of a reminder of G-d, individuals with a strong attachment to G-d experienced greater reductions in skin conductance level than those with a weak attachment to G-d. This effect was not entirely surprising: it may have occurred because those with a strong attachment to G-d were seeking Him out on their own, without a reminder, and thus deriving benefit from that safe haven
without needing to be “led” to the safe haven. This possibility is supported by a body of research attesting to the tendency of stressed believers to turn to G-d and thus derive a multitude of anxiolytic benefits (e.g., Diamond, 2012; Rosmarin, Bigda-Peyton, Ongur, et al., 2013; Sosis & Handwerker, 2011). Alternatively, and in line with Study 2 findings, these individuals may not have been consciously seeking out G-d following the electric shock threat (perhaps because the stress induction was not severe enough to activate their attachment system), but might have been experiencing lower acute stress as a reflection of their general overall lower stress profile (Study 1 results).

Another interesting finding is the discrepancy between self-reported and implicitly measured anxiety. When self-reporting, people who are insecurely attached tend to deny any positive impact of G-d on their anxiety levels. However, when anxiety was measured via skin conductance levels, individuals with weak attachment to G-d were calmed after being primed with G-d. The group of people reporting weak attachment to G-d also reported a high level of G-d attachment avoidance. Attachment avoidance is implicated in a defensive, deactivating attachment strategy that nonetheless leaves high physiological markers of anxiety (e.g., Diamond, Hicks, & Otter-Henderson, 2006). In addition, research has demonstrated that despite their tendency to repress their attachment-related emotions, people who are avoidantly attached still derive benefits from turning to their attachment figures and from feeling supported by their attachment figures, under some circumstances (e.g., Simpson et al., 1992; Slotter & Luchies, 2013). This group of people endorsing weak attachment to G-d thus behaves in a way that fits well with the pattern shown by avoidant people. They denied any self-reported changes in anxiety as a function of G-d exposure, but demonstrated significant calming on a physiological level when exposed to G-d. It is likely that being reminded of G-d does indeed have a calming
effect on individuals who are attached to Him. However, those who explicitly deny a connection with G-d might also tend to be more defensive about explicitly self-reporting any effect of G-d on their mood.

*Alternative Explanations*

Several other possible explanations for my data come to mind when examining these results. I proposed that the association between attachment to G-d and anxiety is accounted for by G-d attachment serving as a buffer against and reducing levels of general anxiety. However, a number of models have been proposed suggesting that the causation is reversed, such that mental health impacts religion. For example, one model notes that people who are stressed become more religious (Park & Slattery, 2013). This is actually, in part, what I am suggesting in the immediate event- that is, people in a state of anxiety will turn to G-d for support. Evidence shows that this tendency to turn to G-d depends on the person (Pargament, Falbe, Ano, & Wachholtz, 2013), and that is what I found (Study 2): people “become more religious” and turn to G-d depending on their relationship with G-d. Thus, in the short-term stress might impact religion, but the effect depends on pre-existing religiosity level. In the long term, increased stress was associated with less positive religion, not more (Study 1). Another model suggests that people in healthy mental states have enhanced psychological resources and greater mental energy to devote to religious engagement (Park & Slattery, 2013). Again, in an experimental and short-term test, my findings do not support this model: people with religious relationships turn to G-d specifically when they are distressed, when psychological resources are low (Study 2), and individuals who turn to G-d get calmed down (Study 3), suggesting the opposite direction for this effect. In other words, my results support directionality leading from religion to lower anxiety, and not vice versa.
Other explanations for the link between religion and mental health rely on findings from neurology and neuropsychology. One such finding is evidence of associations between certain mental illnesses (notably, schizophrenia, temporal lobe epilepsy, and OCD) and increased religiosity (McNamara & Butler, 2013). Certain key brain structures seem to be implicated in the functioning of both increased religiosity and these mental health disorders. However, the limited neuroimaging data makes it difficult to understand the directionality of this association. In addition, my findings were conducted on a normal population, which makes it unlikely that this neurological association is implicated in my research.

Additional evidence points to the connection between religion and brain areas that are implicated in mental health, in both clinical and non-clinical populations. Miller and colleagues (2014) found that placing high importance on religion may cause cortical thickening, which then leads to a decreased risk of developing depression. Inzlicht, McGregor, Hirsh, and Nash (2009) describe how religious conviction is associated with reduced reactivity in the anterior cingulate cortex, which would lead to lower anxiety. A number of papers suggest that deep and focused prayer or meditation impact the brain in several ways that lead to a reduction in anxiety, such as increasing gamma-Aminobutyric acid (Newberg & Waldman, 2009). This body of research is not contradictory to the idea that attachment to G-d is a key factor relieving anxiety; rather, it suggests multiple neurological pathways through which the relationship might function.

Evolutionary Threat Assessment Systems Theory (ETAS Theory) offers another neurologically-based alternative explanation. This theory posits a system of structures in the brain that assess threat and contribute to psychopathology. As applied to religion, the theory implies that the link between religion and mental health is mediated by specific religious beliefs which either activate or decrease activation of the threat assessment system, thus contributing to
anxiety and other mental health disorders (Flannelly & Galek, 2010). ETAS Theory is not incompatible with attachment theory as a mediator of religion and mental health. However, my research, to some extent, directly compares the contribution of religious beliefs and religious attachment to anxiety, and suggests that G-d attachment has a greater impact on buffering against anxiety than the religious beliefs that I assessed.

Limitations and Future Directions

My findings are limited by several factors. First, although over 100 subjects were included in each study, dividing these subjects into groups based on attachment style yielded groups with a relatively small sample size and often with unequal sample sizes. Analyses were only performed when the homogeneity of variances assumption was met, but nonetheless, the small sample sizes limit the generalizability of the findings and suggest the need for replication with larger groups. The small sample sizes among certain religious denominations also made it difficult to extract any meaningful data on how denomination might moderate the effect of attachment to G-d (Noller, 1992). The measures and inductions used are another weak point. Some of the measures were only one item long (e.g., strength of belief in G-d; religious activity), which often reduces variability and power. In addition, the stress induction used in Studies 2-3 may not have been stressful enough to activate the attachment system fully for some people (based on the lack of response in securely attached individuals), whereas the control for Study 2, which was supposed to be innocuous, seemed to be stressful enough to induce unconscious anxiety in some participants (i.e., the avoidantly attached group). A future replication of the methodology used here could benefit from using a different stress induction technique, after piloting several to see which reliably induce or do not induce anxiety. Finally, as is common for social psychological research, using a college sample reduces external validity, even though the
population used here (Queens College, CUNY in Flushing, NY) is of the most diverse in terms of age, ethnicities, and religions (Franek et al., 2008).

My findings suggest several potentially productive future research avenues. It is clear that different religious factors vary dramatically in their impact on mental health. Religion researchers are gradually beginning to include more than one religious variable in their studies, but the inclusion of a range of variables is not yet the norm. Replicating Study 1 using a similarly wide range of religious constructs but with a larger sample size, with more people from different religious denominations, would more definitively flesh out the relative contribution of the various religious constructs (including different G-d attachment styles) to mental health. Another important avenue to explore is the role that attachment to G-d plays in anxiety in real-life situations, following the naturalistic methods used by Belavich and Pargament (2002), for example. In addition, while I excluded non-believers from my project, it would be interesting to examine how non-believers (who may not espouse a belief in G-d but may still have specific associations with different deities) react to stressful situations and to G-d priming.

**Implications**

This paper extends past work in several fields. As proposed by previous researchers (e.g., Granqvist et al., 2012), I extended research on attachment to examine the role of religious attachment on non-religious outcomes. I also replicated, in a more religiously diverse sample (i.e., substantial numbers of Christians, Muslims, and Jews in addition to other religions), several past studies on G-d attachment and mental health that have been conducted in uni-denominational populations (e.g., Christians in Rowat & Kirkpatrick, 2002; Jews in Granqvist et al., 2012).
By including more than one measure of attachment to G-d, I was able to uncover an interesting dynamic of attachment to G-d avoidance (which may, by extension, be applicable to the greater field of interpersonal attachment styles). While secure G-d attachment clearly conferred the greatest anxiolytic benefit, avoidant G-d attachment seemed to have substantial benefits over anxious G-d attachment. Individuals with high G-d attachment avoidance were the only group to demonstrate a clear tendency to seek out G-d when experimentally stressed (but only on an unconscious measure; Study 2). In addition, in one of the analyses (examining the effect of low G-d attachment strength / high G-d attachment avoidance on skin conductance reductions), these individuals derived anxiolytic benefit from being reminded of G-d, although again, this was only demonstrated on the unconscious measure and not on the self-report measure (Study 3). Thus, although avoidantly attached people tend to explicitly deny needing or wanting their attachment figure, they do seem to seek their attachment figure and derive anxiolytic benefit from the presence of their attachment figure, albeit on an unconscious or implicit level.

My findings also contribute to the body of research on general religion and mental health. Many papers have compared the differential contribution of two, three, or even four religious variables to psychopathology; few have gone beyond this. I attempted to arrive at a more comprehensive understanding of the association by systematically including a theory-driven list of almost all of the major religious constructs being researched. This allowed me to directly tease out which religious variables are associated with improved mental health, which are associated with decreased mental health, and which are unrelated. My findings suggest the imperative of reaching a consensus on the methods of measuring religion and the number of religious constructs that should be included in comprehensive research.
Even more importantly, my project provides a direct experimental test of how religion and anxiety are associated in a way that allows one to infer causality. With some notable exceptions (e.g., Rosmarin, Pirutinsky, Auerback, et al., 2011), the vast majority of the literature on religion and mental health is cross-sectional and correlational (Park & Slattery, 2013), which makes it difficult to understand the causative pathways. Study 3 tested these pathways by examining how being primed with religion affects anxiety. Among more than one group (i.e., both people securely attached to G-d and those weakly attached to G-d), and with more than one outcome measure (subjective self-reports and skin conductance levels), I found definitive support for the hypothesis that religion can reduce anxiety.

Several clinical implications follow from my work. As interest in spiritually-integrated treatments and their theoretical underpinnings increase, it has become more evident that an important piece of clinical assessment is the exploration of patients’ relationship to G-d and how that relationship fits into their overall perception of the world and their mental health (e.g., Agishtein et al., 2013). Shorey and Snyder (2006) have already suggested that one’s attachment style has implications for which method of psychotherapy is most effective for an individual, and that attachment style is an important covariate to measure in research. Reinert, Edwards, and Hendrix (2009) further suggest that understanding more specifically how G-d attachment interacts with the therapeutic alliance can have tremendous implications for therapy. Historically, integrating a relationship with G-d into mental health interventions has been successfully implemented (e.g., in the Alcoholics Anonymous 12-step program; Alcoholics Anonymous). Importantly, a recent treatment protocol designed specifically to address insecure attachment to G-d successfully increased G-d attachment security and changed G-d images (Thomas, Moriarty, Davis, & Anderson, 2011; Rasar, Garzon, Volk, O’Hare, & Moriarty, 2013). My findings add a
greater understanding of how G-d attachment impacts anxiety and stress, and the mechanisms through which it does so. Given the previous research on the importance of attachment in therapy and the possibility of increasing one’s G-d attachment security, my data suggest the potential benefit of assessing and possibly addressing G-d attachment when working with believers, particularly when the presenting problem is anxiety.

Conclusions

If John Doe feels frightened, he will turn to a loved one- if, that is, he is lucky enough to have a good relationship with his loved one. If John Doe happens to have a good relationship with G-d, he has an added advantage: G-d is always available. In a series of studies, I found that stressed people who have a relationship with G-d (particularly when it is a healthy relationship) will seek Him out and feel comforted by His presence. Over time, these people develop less anxious personalities, and will display less general anxiety as well as less anxiety in any given threatening situation. Academically, these results serve as a partial answer to several pressing questions and suggest future avenues of research. Clinically, these findings confirm what believers have intuited since King David: turning to a benevolent and loving G-d helps to banish fear.
Appendix: Tables and Figures

Table 1

Study 1: Descriptive statistics for all variables

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<th>Measure</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment to G-d Inventory (AGI): Avoidance</td>
<td>50.00</td>
<td>16.78</td>
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<tr>
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<tr>
<td>Measure of ATG (MAG): Total</td>
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</tr>
<tr>
<td>MAG: Haven</td>
<td>18.11</td>
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<td>.92</td>
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<tr>
<td>MAG: Base</td>
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<td>MAG: Proximity Seeking</td>
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<td>DASS – Depression</td>
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<td>Afterlife Belief</td>
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<td>DUREL: Attendance at Religious Services</td>
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<tr>
<td>DUREL: Private Religious Activity</td>
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<td>DUREL: Intrinsic Religiosity</td>
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<td>Religious Support: Support Provided</td>
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**Table 2**

*Study 1: Summary of regression analysis: Effect of religious variables and G-d attachment measures on perceived stress (PSS)*

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<td></td>
<td></td>
<td>-.40</td>
<td>.05*</td>
<td></td>
</tr>
</tbody>
</table>

$R^2$ | .17 | **.02*** | .31 | **.00***

$F$ for $R^2$ | 2.33 | 3.77

$\Delta R^2$ | .17 | **.02*** | .14 | **.00***

$F$ for $\Delta R^2$ | 2.33 | 6.88

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. 
Table 3

Study 1: Summary of regression analysis: Effect of religious variables and G-d attachment measures on manifest anxiety (TMAS)

<table>
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\[ R^2 .15 \text{ .05*} .18 \text{ .05*} \]

\[ F \text{ for } R^2 \text{ 1.97} \text{ 1.84} \]

\[ \Delta R^2 .15 \text{ .05*} .03 \text{ .25} \]

\[ F \text{ for } \Delta R^2 \text{ 1.97} \text{ 1.38} \]

Note: * p < .05, ** p < .01, *** p < .001.
Table 4

*Study 1: Summary of regression analysis: Effect of religious variables and G-d attachment measures on trait anxiety (BAI-T)*

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\[
R^2 = .00** \quad .00**
\]

\[
F \text{ for } R^2 = 2.93 \quad 2.78
\]

\[
\Delta R^2 = .00** \quad .05 \quad .11
\]

\[
F \text{ for } \Delta R^2 = 2.93 \quad 2.1
\]

Note: * p < .05, ** p < .01, *** p < .001.
Table 5

*Study 1: Summary of regression analysis: Effect of religious variables and G-d attachment measures on recent stress (DASS-STRESS)*

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\[ R^2 \] .17 .02* .27 .00***

\[ F \text{ for } R^2 \] 2.30 3.02

\[ \Delta R^2 \] .17 .02* .10 .01**

\[ F \text{ for } \Delta R^2 \] 2.30 4.48

Note: * p < .05, ** p < .01, *** p < .001.
Table 6

Study 1: Summary of regression analysis: Effect of religious variables and G-d attachment measures on recent anxiety (DASS-ANXIETY)

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\[
R^2 \quad .17 \quad .02* \quad .24 \quad .00**
\]

\[
F \text{ for } R^2 \quad 2.38 \quad 2.62
\]

\[
\Delta R^2 \quad .17 \quad .02* \quad .07 \quad .04*
\]

\[
F \text{ for } \Delta R^2 \quad 2.38 \quad 2.92
\]

Note: * \( p < .05 \), ** \( p < .01 \), *** \( p < .001 \).
Table 7

*Study 1: Summary of regression analysis: Effect of religious variables and G-d attachment measures on recent depression (DASS-DEPRESSION)*

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$R^2$ .27 .00*** .40 .00***

$F$ for $R^2$ 4.24 5.50

$\Delta R^2$ .27 .00** .13 .00**

$F$ for $\Delta R^2$ 4.24 7.05

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. 
Table 8

*Study I: Summary of regression analysis: Effect of religious variables and G-d attachment measures on trait neuroticism (BFI – Neuroticism)*

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\[R^2 \begin{array}{cc} \cdot15 & \cdot05* \end{array}\begin{array}{cc} \cdot22 & \cdot01** \end{array}\]

\[F\text{ for } R^2 \begin{array}{c} 2.01 \end{array} \begin{array}{c} 2.29 \end{array}\]

\[\Delta R^2 \begin{array}{cc} \cdot15 & \cdot05* \end{array}\begin{array}{cc} \cdot07 & \cdot04* \end{array}\]

\[F\text{ for } \Delta R^2 \begin{array}{c} 2.01 \end{array} \begin{array}{c} 2.83 \end{array}\]

Note: * \( p < .05 \), ** \( p < .01 \), *** \( p < .001 \).
When performing partial correlations with all covariates, this correlation dropped to non-significance when controlling for recent changes in religion, social support, and interpersonal attachment anxiety.

Dropped to non-significance when controlling for recent stressful events and interpersonal attachment anxiety.

Dropped to non-significance when controlling for interpersonal attachment.

Dropped to non-significance when controlling for interpersonal attachment anxiety.

Dropped to non-significance when controlling for recent changes in religion, social support, and interpersonal attachment anxiety.

---

**Table 9**

*Study 1: Correlations among Attachment to G-d and Psychopathology Measures*

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*Note:* *p < .05; **p < .01.

All relevant correlations are shaded in gray.

---

11 When performing partial correlations with all covariates, this correlation dropped to non-significance when controlling for recent changes in religion, social support, and interpersonal attachment anxiety.

12 Dropped to non-significance when controlling for recent stressful events and interpersonal attachment anxiety.

13 Dropped to non-significance when controlling for interpersonal attachment.

14 Dropped to non-significance when controlling for interpersonal attachment anxiety.

15 Dropped to non-significance when controlling for recent changes in religion, social support, and interpersonal attachment anxiety.
Table 10A

*Study 1: Correlations among religious variables and psychopathology measures*

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*Note:* *p < .05; **p < .01.

*All relevant correlations are shaded in gray.*
Table 10B

Study 1: Correlations among religious variables and psychopathology measures

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*Note: *p < .05; **p < .01.

*All relevant correlations are shaded in gray.*
Table 11

Study 2: Descriptive statistics for all variables

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Table 12

*Study 2: Correlations among Attachment to G-d and Religious Coping Measures*

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*Note:* **p < .01.
Table 13

*Study 3: Descriptive statistics for all variables*

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Table 14

*Study 3: Factorial ANOVA Summary: Effect of condition and ATG security on AVAS anxiety differences*

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Table 15

*Study 3: Factorial ANOVA Summary: Effect of condition and ATG security on heart-rate differences*

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Table 16

Study 3: Factorial ANOVA Summary: Effect of condition and ATG security on skin conductance differences

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Table 17

**Study 3: Summary of regression analysis: effect of condition and strength of attachment to G-d (MAG) on the AVAS anxiety difference score**

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<td>B</td>
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<td>.26</td>
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<td>.01</td>
<td>.94</td>
</tr>
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<td>MAG Total</td>
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<td>.08</td>
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<td>.88</td>
</tr>
<tr>
<td>Condition X MAG</td>
<td></td>
<td></td>
<td>-.05</td>
<td>.16</td>
</tr>
</tbody>
</table>

| $\Delta R^2$         | .00    | .99              | .001   | .76              |
| $F$ for $\Delta R^2$ | .02    |                  | .10    |                  |

Note: All variables were centered at their median.

* $p < .1$, ** $p < .05$. 
Table 18

Study 3: Summary of regression analysis: effect of condition and strength of attachment to G-d (MAG) on the heart-rate electrocardiogram (ECG) difference score

<table>
<thead>
<tr>
<th></th>
<th>Step 1</th>
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<th></th>
<th>Step 2</th>
<th></th>
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<td>B</td>
<td>SE B</td>
<td>β</td>
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<td>.81</td>
<td>.14</td>
<td>.15</td>
<td>1.17</td>
<td>.81</td>
<td>.14</td>
<td>.15</td>
</tr>
<tr>
<td>MAG Total</td>
<td>-.01</td>
<td>.02</td>
<td>-.02</td>
<td>.81</td>
<td>-.03</td>
<td>.03</td>
<td>-.17</td>
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<td>.19</td>
<td>.22</td>
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<td></td>
</tr>
</tbody>
</table>

\[ \Delta R^2 \]

|        | .02   | .33  | .02   | .22  |

\[ F \text{ for } \Delta R^2 \]

|        | 1.13  | 1.55 |

Note: All variables were centered at their median.

* \( p < .1 \), ** \( p < .05 \).
Table 19

*Study 3: Summary of regression analysis: effect of condition and strength of attachment to G-d (MAG) on the skin conductance level (SCL) difference score*

<table>
<thead>
<tr>
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<td>β</td>
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<td>Condition</td>
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<td>.39</td>
<td>.01</td>
<td>.91</td>
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<td>MAG Total</td>
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<td>.01</td>
<td>.08</td>
<td>.40</td>
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<td>Condition X MAG</td>
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<td>.02</td>
<td>-.40</td>
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</tr>
<tr>
<td>ΔR²</td>
<td>.01</td>
<td>.70</td>
<td>.07</td>
<td>.01*</td>
</tr>
<tr>
<td>F for ΔR²</td>
<td>.36</td>
<td></td>
<td>7.42</td>
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</tr>
</tbody>
</table>

Note: All variables were centered at their median.

* p < .1, ** p < .05.
Table 20

Study 3: Summary of regression analysis: effects of condition and ATG Anxiety on the subjective anxiety (AVAS) difference score

<table>
<thead>
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<td>SE B</td>
<td>β</td>
<td>p</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>p</td>
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<td>.11</td>
<td>.04</td>
<td>.63</td>
<td>.26</td>
<td>.15</td>
<td>.21</td>
<td>.08*</td>
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<td></td>
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<td>.217</td>
<td>-.25</td>
<td>.04**</td>
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</tr>
<tr>
<td>ΔR²</td>
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<td>.88</td>
<td></td>
<td>.03</td>
<td>.04**</td>
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<td>4.38</td>
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Note: All variables were centered at their median.

* p < .1, ** p < .05.
Table 21

Study 3: Summary of regression analysis: effects of condition and ATG Anxiety on the heart-rate electrocardiogram (ECG) difference score

<table>
<thead>
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<td>β</td>
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<td>.82</td>
<td>.15</td>
<td>.14</td>
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<td>.002</td>
<td>.03</td>
<td>.01</td>
<td>.94</td>
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<tr>
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<tr>
<td>Anxiety</td>
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</tr>
<tr>
<td>ΔR²</td>
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<td>.33</td>
<td></td>
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<tr>
<td>F for ΔR²</td>
<td>1.11</td>
<td></td>
<td>.002</td>
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</table>

Note: All variables were centered at their median.
Table 22

*Study 3: Summary of regression analysis: effects of condition and ATG Anxiety on the skin conductance level (SCL) difference score*

<table>
<thead>
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<td>-.01</td>
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<td>Anxiety</td>
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<td>.34</td>
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</tbody>
</table>

$\Delta R^2$ .02  .34  .001  .70

$F$ for $\Delta R^2$ 1.09  .16

Note: All variables were centered at their median.
Table 23

**Study 3: Summary of regression analysis: effects of condition and ATG Avoidance on the subjective anxiety (AVAS) difference score**

<table>
<thead>
<tr>
<th></th>
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<td>β</td>
<td>p</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
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<td>.004</td>
<td>.97</td>
<td>.07</td>
<td>3.34</td>
<td>.002</td>
<td>.98</td>
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<tr>
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<td>.10</td>
<td>.04</td>
<td>.66</td>
<td>.11</td>
<td>.14</td>
<td>.10</td>
<td>.46</td>
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<td>.20</td>
<td>-.08</td>
<td>.55</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

\[ \Delta R^2 \] .002 .90 .003 .55

\[ F \text{ for } \Delta R^2 \] .10 .36

Note: All variables were centered at their median.
Table 24

*Study 3: Summary of regression analysis: effects of condition and ATG Avoidance on the heart-rate electrocardiogram (ECG) difference score*

<table>
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<tr>
<th>Step</th>
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<th></th>
</tr>
</thead>
<tbody>
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<td>$\beta$</td>
<td>$p$</td>
<td>$B$</td>
<td>SE $B$</td>
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<td>.14</td>
<td>.16</td>
<td>1.13</td>
<td>.81</td>
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<td>.02</td>
<td>.05</td>
<td>.62</td>
<td>.03</td>
<td>.04</td>
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<tr>
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<td></td>
<td>-.04</td>
<td>.05</td>
<td>-.11</td>
<td>.45</td>
</tr>
</tbody>
</table>

$\Delta R^2$ | .02 | .30 | .01 | .45 |

$F$ for $\Delta R^2$ | 1.23 | .57 |

Note: All variables were centered at their median.
Table 25

Study 3: Summary of regression analysis: effects of condition and ATG Avoidance on the skin conductance level (SCL) difference score

<table>
<thead>
<tr>
<th></th>
<th>Step 1</th>
<th></th>
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<th></th>
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<tbody>
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<td>SE B</td>
<td>β</td>
<td>p</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>Condition</td>
<td>.03</td>
<td>.39</td>
<td>.01</td>
<td>.95</td>
<td></td>
<td>.05</td>
<td>.39</td>
<td>.01</td>
</tr>
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<td>.02</td>
<td>-.19</td>
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<td>.02</td>
<td>.23</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>ΔR^2</td>
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<td>.98</td>
<td></td>
<td>.03</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F for ΔR^2</td>
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<td></td>
<td></td>
<td>2.66</td>
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<td></td>
<td></td>
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</tbody>
</table>

Note: All variables were centered at their median.
Table 26

**Study 3: Correlations among attachment to G-d and anxiety difference scores**

<table>
<thead>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
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<td>1. AGI: Anxiety</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2. AGI: Avoidance</td>
<td>-.10</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3. MAG Total</td>
<td>.24</td>
<td>-.82*</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. AVAS Anxiety Difference</td>
<td>.24</td>
<td>.10</td>
<td>.02</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5. Electrocardiogram (ECG) Difference</td>
<td>.01</td>
<td>.13</td>
<td>-.16</td>
<td>-.22</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>6. Skin Conductance Level (SCL) Difference</td>
<td>-.10</td>
<td>-.16</td>
<td>.33*</td>
<td>.14</td>
<td>-.24</td>
<td>-</td>
</tr>
</tbody>
</table>

*Note: *p < .05; **p < .01.

*All relevant correlations are shaded in gray.*
Study 2: Conceptualizing Attachment Dimensions as Categories

Figure 1

Low Avoidance

Secure

Anxious

Low Anxiety

Dismissing-Avoidant

Fearful-Avoidant

High Anxiety

High Avoidance
Figure 2

Study 3: Summary of ANOVA of priming condition and G-d attachment security (AGI) on self-reported anxiety (AVAS): Plot of interaction
Figure 3

Study 3: Summary of regression of skin conductance difference on priming condition and strength of attachment to G-d (MAG): Plot of interaction
Figure 4

Study 3: Summary of ANOVA of priming condition and G-d attachment anxiety (AGI) on self-reported anxiety (AVAS): Plot of interaction
References


depression in patients with advanced illness? *Journal of General Internal Medicine, 26*, 751-758.


Peryl Agishtein is a clinical neuropsychologist with a Doctor of Philosophy degree awarded from the Graduate Center, The City University of New York. Peryl was inspired to become a scientist and a psychologist by her parents and grandparents, who imbued her with two key values of intellectual curiosity and a passion to help others. Her interest in biology and in the puzzle of assessment led her to pursue a specialization in neuropsychology, while her interests in interpersonal dynamics attracted her to the lab of Dr. Claudia Brumbaugh, an attachment researcher at the Graduate Center. Peryl gained tremendously from the sensitive and attuned mentoring of Dr. Brumbaugh, and remained in her lab throughout graduate school. She was also fortunate enough during the course of her schooling to conduct psychological research as well as clinical work under the mentorship of many brilliant and dedicated individuals. Peryl’s research interests involve several social psychological issues and their impact on clinical problems, including the development of attachment security, cultural/religious factors, and emotional skills. She has presented her research findings at conferences across the United States and has published several articles in peer-reviewed journals. Her doctoral dissertation investigated how attachment to G-d interacts with everyday stress and anxiety; she was inspired to examine this idea by her Jewish faith and her deep belief in G-d, as well as years of philosophical discussions with her father. Peryl spends her free time with her husband and two children, and loves to hike, travel, photograph, and play piano whenever she has the opportunity. She feels fortunate to spend the rest of her time doing two activities that she finds fulfilling and meaningful: psychological research and clinical work.