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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

ATTACHMENT STYLES AND THE INTERPERSONAL-  
PSYCHOLOGICAL THEORY OF SUICIDE: AN  
EXAMINATION OF INTERRELATIONSHIPS

A Dissertation Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Philosophy

Jason A. Kacmarski

College of Education and Behavioral Sciences  
Department of Applied Psychology and Counselor Education

July 2016

This Dissertation by: Jason A. Kacmarski

Entitled: *Attachment Styles and the Interpersonal-Psychological Theory of Suicide: An Examination of Interrelationships*

has been approved as meeting the requirement for the Degree of Doctor of Philosophy in the College of Education and Behavioral Sciences in the Department of Applied Psychology and Counselor Education, Program of Counseling Psychology

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Date of Dissertation Defense                      May 2, 2016

Accepted by Graduate School

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## ABSTRACT

Kacmarski, Jason A. *Attachment Styles and the Interpersonal-Psychological Theory of Suicide: An Examination of Interrelationships*. Published Doctor of Philosophy dissertation, University of Northern Colorado, 2016.

As suicide rates have increased over the past decade, it has become increasingly important for researchers and clinicians to develop a better understanding of the factors that may influence suicide-related behavior. The present study investigated the interrelationships between attachment styles, constructs of the interpersonal-psychological theory of suicide, and self-reported suicide risk among a sample of undergraduate college students ( $N = 435$ ). Structural equation modeling was utilized in order to develop a well-fitting model based on collected data. Results showed that attachment anxiety and attachment avoidance were positively associated with higher levels of perceived burdensomeness and thwarted belongingness, but not the acquired capability of suicide. In turn, perceived burdensomeness, thwarted belongingness, and the acquired capability for suicide were positively associated with higher levels of self-reported suicide risk. The indirect relationship between attachment anxiety and self-reported suicide risk was partially mediated by the constructs of the interpersonal theory of suicide and the indirect relationship between attachment avoidance and self-reported suicide risk was fully mediated by the constructs of the interpersonal theory of suicide. These results suggest that the assessment of attachment styles and the constructs of the

interpersonal theory of suicide may play an important role in evaluating and understanding suicide risk.

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## CHAPTER I

### INTRODUCTION

Over the past decade, researchers have noted an increase in the rate of suicide among various groups around the world. Data from the Centers for Disease Control and Prevention (CDC) indicate that, for the first time in recent history, more middle-aged adults died by suicide in 2010 than died in motor vehicle accidents (CDC, 2013). Overall, more than 42,000 Americans died by suicide in the year 2014 (CDC, 2016), the most recent year for which suicide-related data is available, and over 800,000 individuals die by suicide worldwide each year (World Health Organization, 2014). In spite of this, researchers know relatively little about the mechanisms that underlie suicidal behavior. In order to address this shortcoming, new research is needed to find and better understand individual factors that influence suicidal thoughts and behaviors so as to better identify and intervene with those who are at increased risk for death by suicide.

#### **Interpersonal-Psychological Theory of Suicide Theoretical Framework**

In an effort to combat the current relative lack of knowledge surrounding the mechanisms that lead to suicide, Joiner (2005) introduced the interpersonal-psychological theory of suicide. This theory aims to provide a framework for practitioners and researchers alike to conceptualize suicidal behavior and its underpinnings. While several researchers (e.g., Baumeister, 1990; Shneidman, 1993; Williams & Pollock, 2000) have

attempted to explain suicide-related behavior in various ways, none have done so in such a comprehensive manner.

Prior theories of suicide have typically addressed only a modicum of the factors that have been linked to suicidal behavior. Shneidman (1993) posited that suicidal behavior came about as a result of what he referred to as *psychache*, a form of mental pain and anguish. While few would argue that such anguish plays no role in suicidal behavior, Shneidman's theory is unable to account for the plethora of research indicating that while many individuals experience psychological pain in its various forms, most of them do not, in fact, die by suicide. One rather striking illustration of this idea is that rates of both depression and non-lethal suicide attempts are consistently found to be higher among women while death by suicide is much more common among men (e.g., Oquendo et al., 2001).

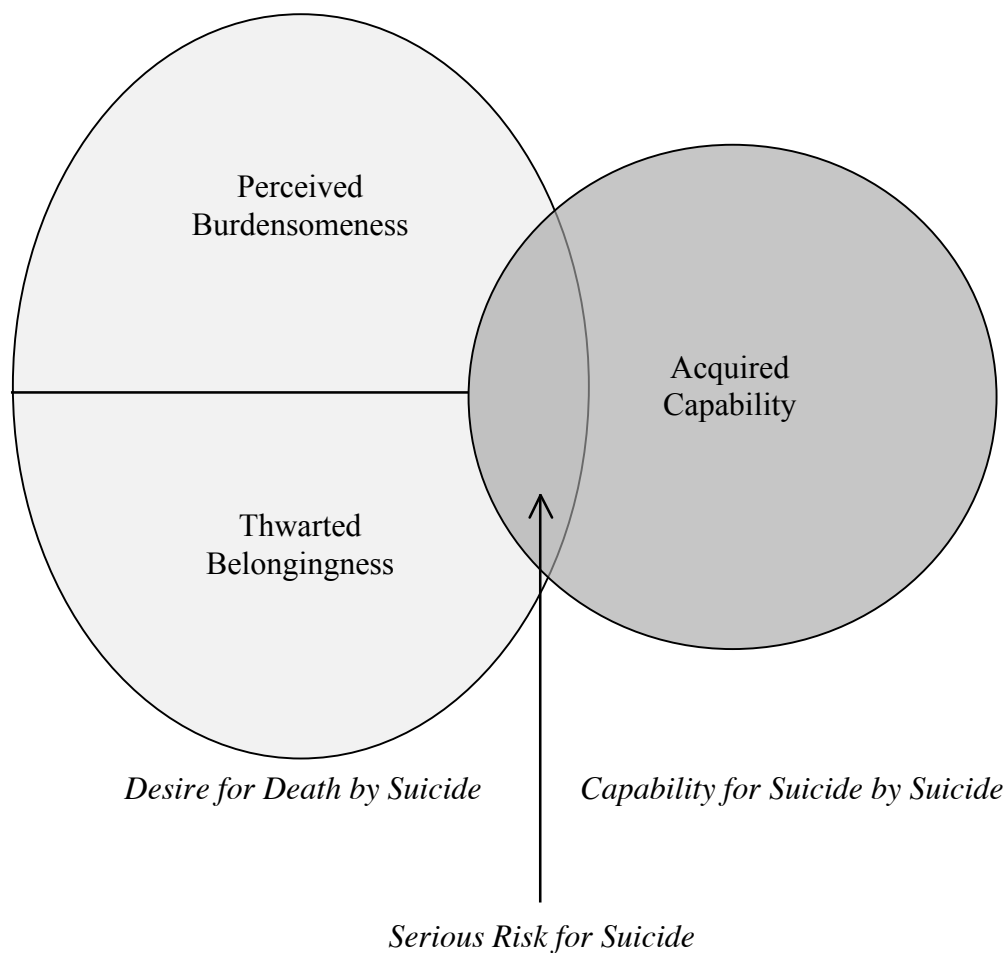
Williams (1997) provided an alternative theory for suicidal behavior that is often referred to as the "cry of pain" model. Within this model, suicidal behavior is hypothesized to come about as a result of an individual feeling entrapped by either external factors and situations or internal processes from which they cannot escape. As part of their description of this model, Williams and Pollock (2000) assert that "it is now clear that the differences between completed suicide and deliberate self-harm have been overstated" (2000, pp. 88-89) and that the primary differentiating factor between these two behaviors is the degree of hopelessness an individual experiences related to overcoming their felt sense of entrapment. While this idea fits well with their proposed model, there appears to be a dearth of evidence to support this statement. Instead, research (Beck, Steer, Kovacs, & Garrison, 1985; Klonsky, Kotov, Bakst, Rabinowitz, &

Bromet, 2012; Lamis et al., 2014) has shown that increased levels of hopelessness are not necessarily related to future death by suicide. For example, Beck, Brown, Berchick, Stewart, and Steer (1990), in one of the largest ever prospective studies of factors related to death by suicide, found that while high levels of hopelessness correctly identified the majority of individuals who eventually died by suicide, false positive rates were extremely high. These findings suggest that hopelessness alone cannot differentiate between those who die by suicide and those who do not. The interpersonal-psychological theory of suicide (Joiner, 2005) provides a means of understanding what leads some individuals who are experiencing high levels of intrapsychic pain to undertake serious suicide attempts or to eventually die by suicide while others do not.

At its core, Joiner's (2005) interpersonal-psychological theory of suicide posits that suicidal behavior comes about as the result of an interaction between three constructs: perceived burdensomeness, thwarted belongingness, and the acquired capability for suicide. Among these constructs, perceived burdensomeness, the belief that one is a burden on important others in one's life, and thwarted belongingness, feelings that one is alone and has nowhere to belong, are believed to be most closely related to the development of suicidal ideation (Van Orden et al., 2010). In a general sense, these two constructs are similar to Shneidman's (1993) psychache and Williams's (1997) cry of pain. However, unlike these, and other, theoretical frameworks, the inclusion of the construct of acquired capability for suicide, or the ability to overcome the fear and pain inherent in a suicidal act, within the interpersonal-psychological theory of suicide (Joiner, 2005) allows for a conceptualization of what it is that differentiates individuals experiencing intrapsychic pain who do not undertake serious suicide attempts or die by



suicide from those who do. It is this that makes the interpersonal-psychological theory of suicide (Joiner, 2005) a uniquely valuable contribution to modern suicidology. The relationship between the three constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) and increased suicide risk is illustrated in Figure 1.



*Figure 1.* The constructs of the interpersonal-psychological theory of suicide and their relationship to suicide risk

The interpersonal-psychological theory of suicide (Joiner, 2005) describes several constructs that involve intrapsychic perceptions and interpretations of interpersonal relating. In other words, it emphasizes the phenomenological experience of suicidal

individuals, not the objective appraisal of outsiders. As noted by Joiner (2005), feelings that important others in one's life would be better off if the individual were no longer around, that one is a burden on these important others, are often not based in reality. Nonetheless, they feel real to the individual and it is this feeling that creates the risk. The emphasis within the interpersonal-psychological theory of suicide (Joiner, 2005) on various aspects of interpersonal relationships suggests that research examining this theory from a sound foundation related to interpersonal functioning may be beneficial. Bowlby's (1969) attachment theory is one such foundation.

### **Attachment Theoretical Framework**

John Bowlby (1969), the progenitor of attachment theory, provided a means for conceptualizing the ways in which early parent-child relationships could have a lasting impact on an individual's style of relating to others, including various personality characteristics that an individual would develop throughout their lifespan. Central to his theory is the idea that the bond forged between an infant and a primary caregiver allows the infant to develop internal working models of the self in relation both to others and to the world as a whole (Bowlby, 1969). Once developed, these internal working models serve as a lens through which an individual engages with the world. Ideas related to trusting others, the safety of the world in general, and one's own self-concept are all filtered through this lens leading individuals to develop a prototypical method of responding to events in their lives. These prototypical ways of responding are referred to as attachment styles and are believed to be relatively stable into adolescence and adulthood (Bowlby, 1973; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). This view of attachment styles as stable has at times been somewhat controversial, with

some scholars arguing that attachment styles can be best conceptualized from a revisionist perspective in which they are viewed as unstable and constantly evolving (Lewis, Feiring, & Rosenthal, 2000). However, more recent research supports the prototypic perspective of attachment in which variation in attachment security over time is best explained by the presence of a relatively constant, underlying factor or prototype (Fraley, Vicary, Brumbaugh, & Roisman, 2011).

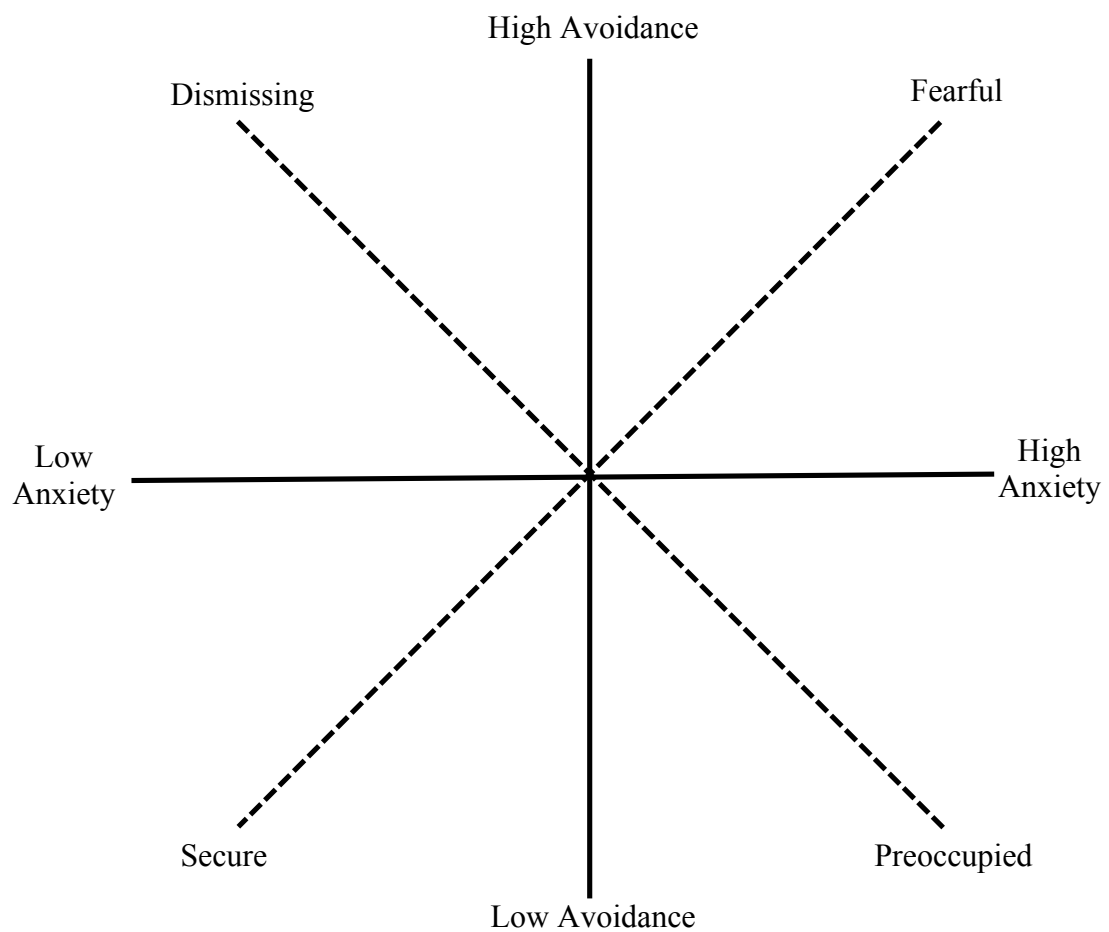
In investigating the relationship and affective bond between mother and child, Ainsworth, Blehar, Waters, and Wall (1978) identified three prominent attachment styles: secure, insecure-ambivalent (now often referred to as anxious), and insecure-avoidant. In addition to these three initial parent-child attachment styles, Main and Solomon (1986) identified a fourth attachment style that they called insecure-disorganized/disoriented. Children classified as securely attached tended to be soothed by the presence of, and to engage actively with, their primary caregiver; ambivalent or anxiously attached children tended to seek out proximity to their caregiver while simultaneously resisting comforting; and children classified as displaying avoidant attachment tended to actively avoid proximity to their caregiver (Ainsworth et al., 1978). In contrast, children with a disorganized/disoriented attachment style tended to have inconsistent responses to their caregiver that do not fall into any of the three previously described attachment style categories (Main & Solomon, 1986). Analogous behaviors have also been described across the lifespan with securely attached adults tending to be more self-reliant and confident, anxiously attached adults tending to be more juvenile and dependent on others, avoidantly attached adults tending to be distrustful of others and to distance themselves from close relationships (Bowlby, 1977), and adults with disorganized/disoriented

attachment styles continuing to relate in inconsistent and otherwise difficult to categorize manners (Hesse & Main, 2000).

More recently, researchers have taken a different approach in assessing and describing adult attachment styles focused on high and low levels of various dichotomous traits. Perhaps the first to use such a system were Bartholomew and Horowitz (1991) who identified four primary attachment styles based on the positivity or negativity of one's view of the self and others. They described individuals who have a positive view of both the self and others as securely attached while those with a more negative view of the self were classified as preoccupied, those with a more negative view of others were classified as dismissing, and those with a negative view of both the self and others were classified as fearful. Brennan, Clark, and Shaver (1998) adapted this model, retaining Bartholomew and Horowitz's (1991) four attachment styles while conceptualizing them based on levels of attachment anxiety and attachment avoidance, with high levels of attachment anxiety being analogous to a negative view of the self and high levels of attachment avoidance being analogous to a negative view of others. Brennan et al.'s (1998) model was utilized for the current study and is visually represented in Figure 2.

### **Perceived Burdensomeness and Suicide Risk**

Perceived burdensomeness refers to an individual's feeling that they are a burden to the important people in their life (Joiner, Van Orden, Witte, Selby, et al., 2009). Individuals who are experiencing high levels of perceived burdensomeness may feel that the important others in their lives would be better off if they were no longer around. Research has shown a link between perceived burdensomeness and suicidal ideation. Van Orden, Lynam, Hollar, and Joiner (2006) provided preliminary evidence showing that



*Figure 2.* Orthogonal model of adult attachment based on Brennan et al.'s (1998) model

perceived burdensomeness accounted for additional variance in suicidal ideation as measured by self-report beyond that which was accounted for by hopelessness after controlling for demographic variables of age and gender, the presence of a personality disorder, and depressive symptoms. A similar relationship has been found among individuals in the military, with perceived burdensomeness showing a strong correlation with self-reported levels of suicidal ideation among active duty United States Air Force personnel (Bryan, Ray-Sannerud, Morrow, & Etienne, 2013).

In addition to the evidence noted above, indirect evidence for a link between perceived burdensomeness and suicidality is also available. According to the interpersonal-psychological theory of suicide (Joiner, 2005), the construct of perceived burdensomeness can be thought of as being made up of two primary components: feelings of self-hate and feelings of liability (Van Orden et al., 2010). Research related to these two components supports the link between perceived burdensomeness and suicidal ideation.

Self-hate can be conceptualized as feelings of disgust directed towards oneself. This includes significant negative affectivity related to one's own behaviors, beliefs, or appearance, which can lead an individual to see the self as lacking in worth and deserving of dislike by others. Van Orden et al. (2010) discussed self-hate as being defined by the presence of three measurable attributes: low self-esteem, self-blame or shame, and general agitation, all of which have been linked to suicide-related behaviors. For example, in a study of 542 adolescents in the United States that included an inpatient group and a high school comparison group, researchers found that low self-esteem was

correlated with increased suicidal ideation among both groups (Overholser, Adams, Lehnert, & Brinkman, 1995).

The link between self-blame or shame and suicidality can be illustrated by the link between diagnoses of borderline personality disorder (BPD) and eventual death by suicide. Individuals who have been diagnosed with BPD have self-reported intense levels of shame at a rate much higher than the general population (Rizvi & Linehan, 2005). Considered along with the fact that studies have shown that the suicide rate among individuals with a BPD diagnosis is up to 50 times higher than the suicide rate among the general population (Workgroup on Borderline Personality Disorder, 2001), this provides evidence for a link between shame and suicidality.

The inclusion of generalized agitation as a component of perceived burdensomeness is notable in that its inclusion is mainly the result of it being perceived as an indication that levels of self-hate have grown so powerful as to be difficult to contain internally (Van Orden et al., 2010). Research supports the link between agitation and suicide. For instance, Busch, Fawcett, and Jacobs (2003) found that individuals receiving inpatient psychiatric care who died by suicide showed increased levels of agitation in the days leading up to the suicidal act.

Liability is perhaps best understood as the feeling that one is worth more dead than alive to those they consider important. It is this liability aspect of perceived burdensomeness that is being referred to by Ribeiro and Joiner (2009) when they indicate that high levels of perceived burdensomeness “may lead to the potentially dangerous belief that one’s death is worth more than one’s life” (p. 1292). Like self-hate, liability is believed to be made up of several components: the belief that one is a burden to close

others, the belief that one is expendable or unwanted, and distress related to specific life events (Van Orden et al., 2010).

Researchers have found that the presence of feelings that one is a burden to others can differentiate those with a history of suicide attempts from non-attempters (Van Orden et al., 2006). Similarly, feeling that one is expendable has also been associated with increased risk for suicide. For example, in a study of adolescents and young adults, Woznica and Shapiro (1990) found that individuals who experienced increased feelings of expendability were rated by their therapists as having higher levels of suicidal desire than those who did not.

Distress related to numerous negative life events, such as unemployment, has also been shown to be related to suicidality. For example, Brown, Beck, Steer, and Grisham (2000) conducted a 20-year prospective study of individuals seeking outpatient psychiatric services in order to determine factors that influence later suicidality. Results indicated that status as unemployed had a unique and significant impact on future suicide. As can be seen, overall there is a significant amount of research support relating aspects of the construct of perceived burdensomeness to suicide risk.

### **Thwarted Belongingness and Suicide Risk**

Thwarted belongingness refers to feelings of isolation, aloneness, and separation from others whom an individual values (Joiner, Van Orden, Witte, Selby, et al., 2009). This may involve feeling unloved by one's family, ignored by close friends, or shunned by a group perceived as important. In the broadest sense, it is the feeling of being an outsider, of not belonging anywhere or with anyone. As with perceived burdensomeness, thwarted belongingness can be subdivided and thought of as being made up of two



constructs: feelings of loneliness and perceived lack of reciprocal care (Van Orden et al., 2010).

There is a great deal of research (Dieserud, Røysamb, Ekeberg, & Kraft, 2001; Heinrich & Gullone, 2006; Martin et al., 2013; Roberts, Roberts, & Chen, 1998; Stravynski & Boyer, 2001; Waern, Rubenowitz, & Wilhelmson, 2003) supporting a relationship between loneliness and suicidal behavior ranging from direct explorations of the link between self-reported loneliness and suicidality to the effectiveness of suicide interventions that target loneliness. Research examining social isolation, a construct closely related to loneliness, has also consistently found a relationship with suicidal ideation. For example, in a study examining differences in social connectedness between individuals who died by suicide and living controls, researchers found that individuals who died by suicide were less likely to be married, to have strong connections to family, and to engage in community activities (Duberstein et al., 2004).

Lack of reciprocal care refers to a phenomenon in which an individual not only does not feel cared for by others, but simultaneously does not express caring towards others in their life (Van Orden et al., 2010). Researchers have found that reciprocal care is an aspect of relationships that is necessary in order for individuals to feel like they belong (Baumeister & Leary, 1995). Additionally, research discussed above (e.g., Waern et al., 2003) related to loneliness is often applicable to the lack of reciprocal care as well. Specifically, such care is likely to be absent or lessened in individuals who are experiencing social isolation or separation from important others due to homelessness or other aversive life events (Van Orden et al., 2010).

### **Acquired Capability for Suicide and Suicide Risk**

Klonsky and May (2013) have suggested that a primary knowledge gap within the study of suicide is the identification of factors that differentiate those who have thoughts of suicide from those who engage in actual suicide attempts. Within the interpersonal-psychological theory of suicide (Joiner, 2005), acquired capability for suicide, believed to be made up of the constructs of fearlessness and tolerance for pain, is posited to be that factor. Research has borne out the presence of a link between acquired capability for suicide and suicide risk. In a study examining depressed individuals who were experiencing suicidal ideation, self-reported levels of fearlessness and pain tolerance were found to differentiate individuals who attempted suicide from those who did not (Smith, Cukrowicz, Poindexter, Hobson, & Cohen, 2010). In addition, Christensen, Batterham, Soubelet, and Mackinnon (2013) found that individuals who had engaged in prior recent self-harm, a behavior used as an analogue for acquired capability for suicide in their study, were more likely to have either attempted suicide or made plans to attempt suicide than those who had not engaged in self-harm. This finding held for all types of inflicted self-harm that they studied (i.e., medication overdose without intent to die, cutting, banging one's head or fist, and denial of basic necessities as a form of self-punishment).

Similar to past self-injury, the interpersonal-psychological theory of suicide (Joiner, 2005) posits that prior suicide attempts have a profound impact on levels of acquired capability for suicide as they lead to habituation to pain and, therefore, a higher pain tolerance and reduced fear of death (Van Orden et al., 2010). This is consistent with studies that have found previous suicide attempts to be the primary risk factor for future

death by suicide. As one example, Busch et al. (2003) found that almost 50% of inpatients who died by suicide had at least one prior suicide attempt. Additionally, researchers found that each prior suicide attempt an individual endured increased the relative risk for a future attempt by approximately 32% among a sample of 73 inpatients at a psychiatric hospital (Leon, Friedman, Sweeney, Brown, & Mann, 1990). Additional studies including a 20-year prospective study of 6,891 psychiatric outpatients (Brown et al., 2000) and a study of 108,705 individuals around the globe who completed World Health Organization Mental Health Surveys (Borges et al., 2010) found similar links between past and future or planned suicide attempts. These studies provide additional support for the role of acquired capability for suicide in determining which individuals are at greatest risk for eventual death by suicide.

#### **Attachment Anxiety and Suicide Risk**

Attachment anxiety, or the tendency to be insecure and anxious about a potential relationship breakdown (Bowlby, 1973), has been linked with increased risk for suicide among individuals of varying age including both adolescents (Lessard & Moretti, 1998; Wright, Briggs, & Behringer, 2005) and adults (Gormley & McNiel, 2009; Lizardi et al., 2011). High levels of attachment anxiety have been found to be directly related to prior suicide attempts or serious self-injury among a sample of adults, though the size of this effect,  $R^2 = .05$ , was found to be relatively small (Gormley & McNiel, 2009). Another study with adult participants found that interpersonal problems (i.e., sensitivity, aggression, and lack of sociability) mediated the relationship between attachment anxiety and suicide-related behavior (Stepp et al., 2008) suggesting that the effect of attachment anxiety on suicide risk may be indirect.

### **Attachment Avoidance and Suicide Risk**

While there is evidence linking attachment anxiety to suicide risk, the evidence for attachment avoidance is seemingly more controversial. Some researchers have found a link between attachment avoidance and suicide risk among adolescents (Grunebaum et al., 2010) while others have not. For example, Adam, Sheldon-Keller, and West (1996) found that adolescents classified as having a dismissive attachment style, which is consistent with high levels of attachment avoidance, were less likely than their peers to have a history of suicide attempts. In addition, studies examining the link between attachment avoidance and suicidal ideation have found that adolescents with high levels of attachment avoidance are less likely to experience suicidal ideation than are their peers with high levels of attachment anxiety (Lessard & Moretti, 1998). Similar research with adults has had somewhat mixed results with one study finding a link between attachment avoidance and suicide attempts among adults (Grunebaum et al., 2010) while others have found no such link (e.g., Gormley & McNiel, 2009; Lizardi et al., 2011).

Overall, these findings seem reasonable in the context of the interpersonal-psychological theory of suicide (Joiner, 2005) as individuals with an avoidant attachment style could be much less likely to experience feelings of perceived burdensomeness and thwarted belongingness due largely to their social withdrawal. In other words, because individuals with an avoidant attachment style are likely to forgo more intimate relationships as part of their everyday interpersonal repertoire, they may be less likely than others to experience the negative interpersonal affectivity associated with perceived burdensomeness and thwarted belongingness. This, in turn, could lead to fewer and less intense experiences of suicidal ideation. Because of this, it is possible that the effect of

attachment avoidance on suicide risk is most closely related to an increase in acquired capability for suicide as opposed to reactivity to interpersonal struggles that may be more common among individuals with high levels of attachment anxiety, and that attachment avoidance may, in fact, even play somewhat of a protective role with regards to suicide risk.

### **Study Rationale and Purpose**

With evidence indicating that the overall rate of suicide among individuals in the United States has increased over the last decade (National Center for Health Statistics, 2013), there is a tremendous need to develop further understanding of the processes that underlie suicidal thinking and behavior. There is preliminary evidence to suggest that the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) provide a useful framework for conceptualizing suicidal behavior. Specifically, one study (Kacmarski, Hicks, & Rings, 2014) found that the constructs of thwarted belongingness and perceived burdensomeness may be as or more effective with regards to predicting suicidal ideation among undergraduate college students than other constructs frequently identified as strongly related to suicide attempts such as hopelessness (e.g., Klonsky, Kotov, Bakst, Rabinowitz, & Bromet, 2012) and depressive symptoms (e.g., Konick & Gutierrez, 2005). In addition, the interpersonal-psychological theory of suicide (Joiner, 2005) is the only current theory of suicide with even preliminary empirical support that provides a clear and articulable means for understanding what differentiates individuals who are experiencing suicidal ideation from those who undertake a serious suicide attempt that is not simply increased severity of symptoms related to suicidal ideation. The inclusion of the construct of acquired capability for suicide makes the interpersonal-

psychological theory of suicide (Joiner, 2005) potentially far more useful than other theories of suicidal behavior and merits continued research and deeper understanding.

While there is support in the literature for a relationship between insecure attachment and suicide risk (Adam et al., 1996; Lessard & Moretti, 1998; Lizardi et al., 2011), there remains disagreement over whether it is attachment anxiety (Gormley & McNiel, 2009; Lessard & Moretti, 1998; Wright et al., 2005), attachment avoidance (Grunebaum et al., 2010; Lizardi et al., 2011), or perhaps some as yet unidentified combination of the two that is responsible for this. The lack of consensus here is likely to be related to what Mikulincer and Shaver (2007) described as a dearth of research and literature related to suicidal behavior in the context of attachment theory. Further research is necessary to better understand this relationship. The goal of the present study was to examine the relationship between the attachment-related constructs of anxiety and avoidance, the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005), and suicide risk, thereby providing important new information related to the relationship between attachment and suicide risk while simultaneously identifying a possible pathway through which the relationship between attachment style and suicide risk can be explained. Such knowledge may benefit future researchers and practitioners in developing new, more effective ways of assessing for and treating suicidality among both clients or patients and the general population.

Research supports the presence of a direct relationship between both perceived burdensomeness (Van Orden et al., 2006) and thwarted belongingness and suicidal ideation (Van Orden, Witte, James, et al., 2008), a primary component of suicide risk (e.g., Beck & Steer, 1989; Borges et al., 2010; Brown et al., 2000; Wichstrøm, 2009). In

addition, research supports the presence of a direct relationship between acquired capability for suicide and increased suicide risk (Christensen et al., 2013; Smith et al., 2010). Similarly, research has suggested that attachment anxiety is linked to future suicide-related behavior (Gormley & McNiel, 2009), though the mechanisms underlying this relationship remain unclear, while evidence for a relationship between attachment avoidance and future suicide-related behavior is currently conflicting (Gormley & McNiel, 2009; Grunebaum et al., 2010). The link between attachment and constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) remains theoretical at this time, though researchers have found commonalities among the concepts that underlie these constructs (Stepp et al., 2008). As such, it was theorized that the link between attachment anxiety and suicide risk would be fully mediated by the constructs of perceived burdensomeness, thwarted belongingness, and acquired capability for suicide (see Figure 3). While the relationship between attachment avoidance and suicide risk was less certain (Lessard & Moretti, 1998), such a relationship was theoretically likely. Further, both theory and evidence suggest that attachment avoidance on its own may, in fact, play somewhat of a protective role with regards to suicide risk (Adam et al., 1996; Gormley & McNiel, 2009; Lessard & Moretti, 1998). As such, the relationship between attachment avoidance and suicide risk was also hypothesized to be fully mediated by the constructs of perceived burdensomeness, thwarted belongingness, and acquired capability for suicide. However, attachment avoidance was proposed to be negatively related to both perceived burdensomeness and thwarted belongingness and positively related to acquired capability for suicide, thereby accounting for the less concrete role that attachment avoidance was likely to play in suicide risk.

Based on the available research, a primary model (see Figure 3) of the relationships between attachment constructs, constructs of the interpersonal-psychological theory of suicide, and suicide risk was proposed. The primary model included all of the hypothesized interrelationships described above. In addition, an alternative model (see Figure 4) in which the primary model is nested was also proposed. The alternative model includes all of the interrelationships shown in the primary model and adds direct effects between both attachment anxiety and suicide risk and attachment avoidance and suicide risk, thereby removing the full mediation of these constructs that is hypothesized in the primary model. The following research questions were then developed:

- Q1 Does the primary theoretical explanatory model (see Figure 3) adequately fit the observed relationships in the data?
- Q2 Does the primary model demonstrate a statistically better or more parsimonious fit to the observed interrelationships between these constructs in the data than the alternative model (see Figure 4)?

### **Limitations**

While it has received a surprising amount of empirical support since its inception (Joiner, 2005), the interpersonal-psychological theory of suicide remains a relatively new theory. Perhaps in part because of this newness, there is currently no literature directly linking the constructs of attachment anxiety and attachment avoidance to the three primary interpersonal-psychological theory of suicide (Joiner, 2005) constructs of perceived burdensomeness, thwarted belongingness, and acquired capability for suicide. Of additional concern, the majority of research examining the link between attachment style and suicidal behaviors has focused on adolescents. Taken together, this indicates that the theoretical basis for the present study remains untested.



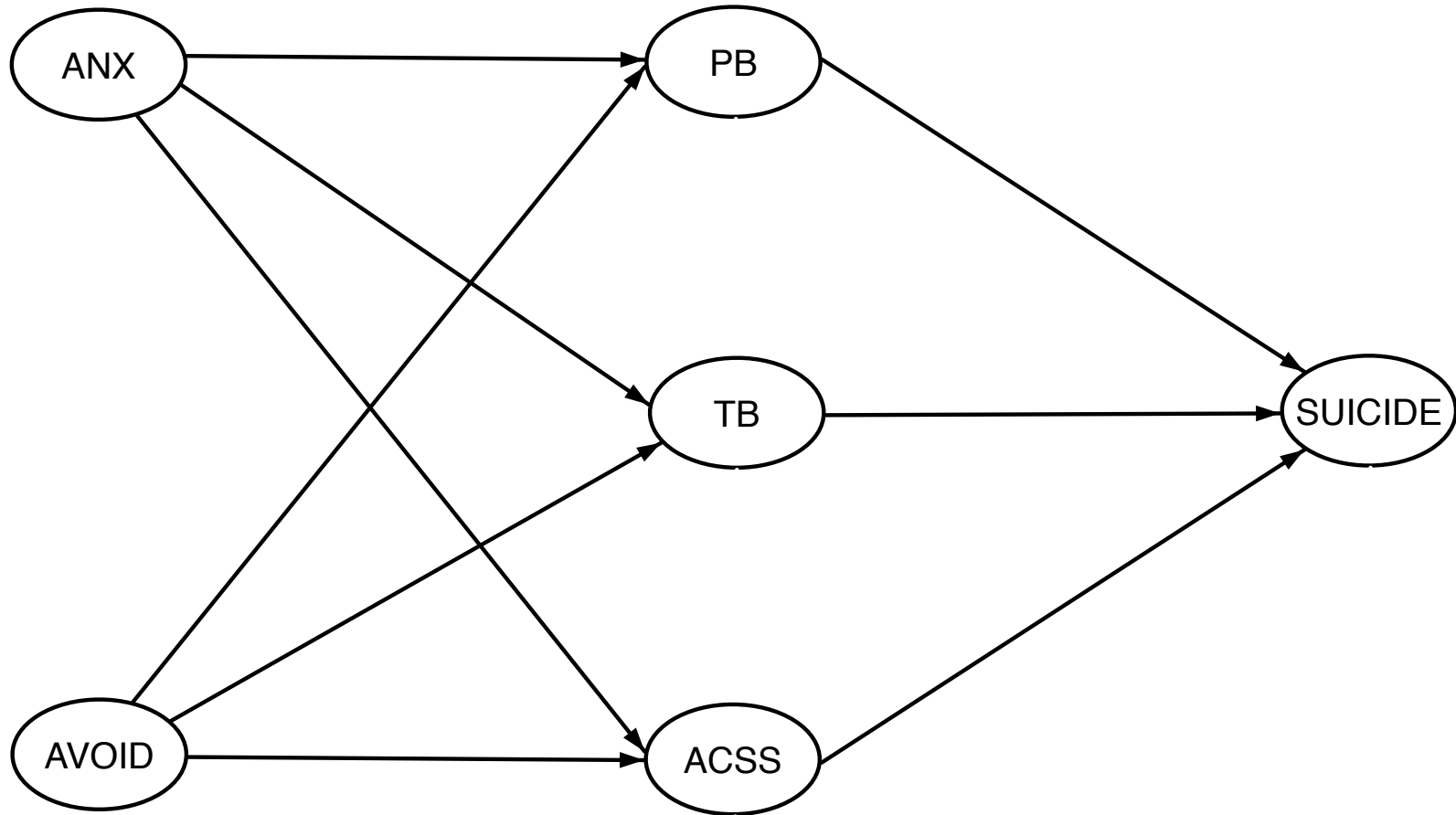


Figure 3. Primary model. . ANX = Attachment Anxiety, AVOID = Attachment Avoidance, PB = Perceived Burdensomeness, TB = Thwarted Belongingness, ACSS = Acquired Capability for Suicide.

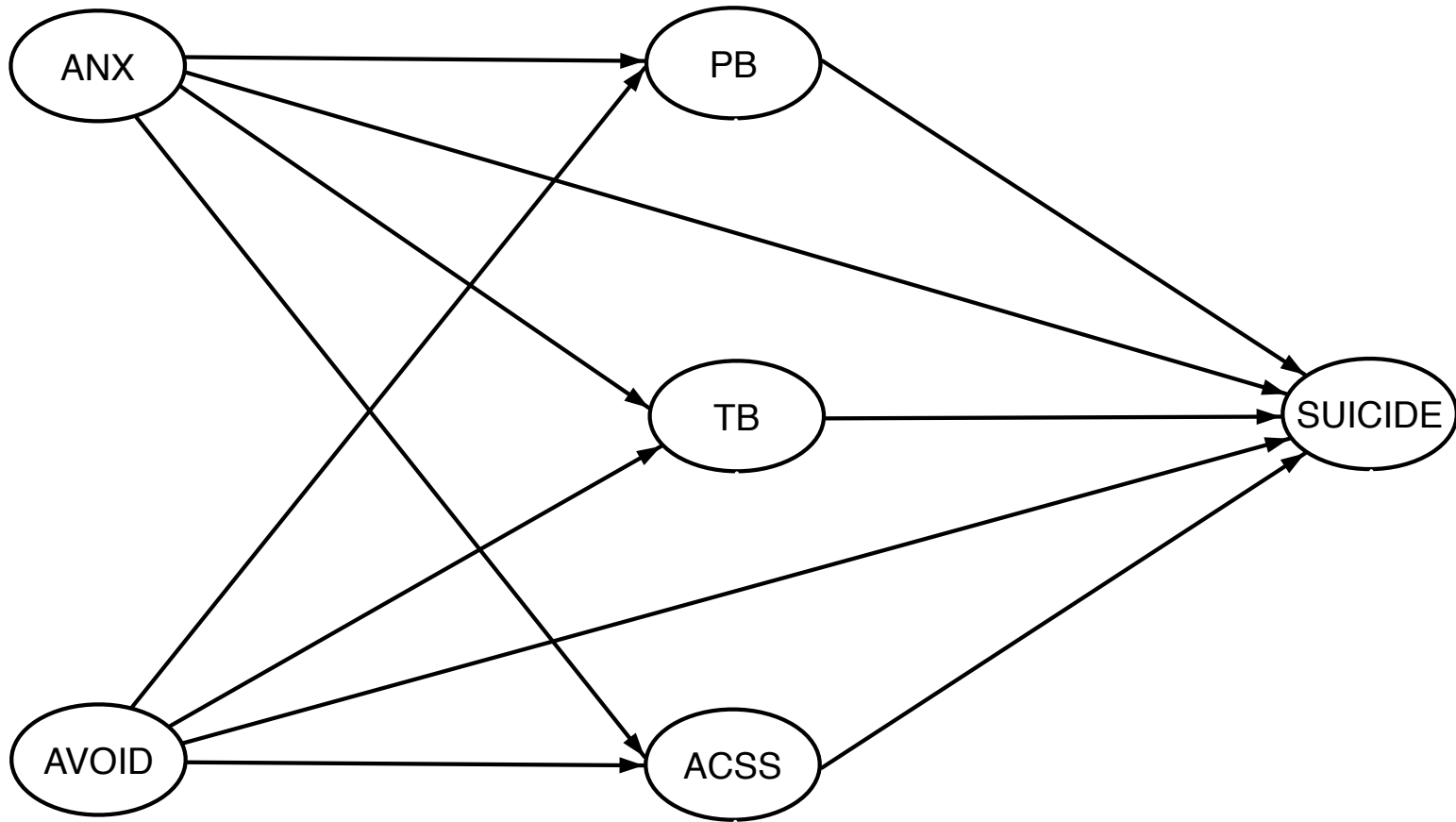


Figure 4. Alternative Model. ANX = Attachment Anxiety, AVOID = Attachment Avoidance, PB = Perceived Burdensomeness, TB = Thwarted Belongingness, ACSS = Acquired Capability for Suicide.

Because this study utilized an undergraduate sample composed largely of first year students from a public, medium-sized, Rocky Mountain region university, there were inherent limits to generalizability. Specifically, the results of this study may be significantly different than the results of a similar study examining these constructs among an adult or older adult sample. As such, any generalization of results should be undertaken carefully.

Numerous factors including degree of hopelessness, degree of depression, and prior suicide attempts have been shown to influence suicide risk (e.g., Beck & Steer, 1989; Brenner, Hassan, & Barrios, 1999; Brown et al., 2000; Busch et al., 2003) and it is likely that other factors remain as yet unidentified in the literature. Because of the large number of such factors and the often high intercorrelations between them, it would be inadvisable to attempt to incorporate every construct that may contribute to increases in suicidal ideation and suicide risk into this study. In addition, as a result of things such as the file drawer phenomenon, it is possible that additional factors that may influence suicide risk remain as yet undiscussed in the literature, or that the importance or lack thereof of specific factors cannot be accurately determined via a literature review. As such, there is the potential that some important factors may not be included in this analysis or that, in contrast, some unimportant factors may be included, thereby limiting its utility.

Also of note, the constructs included in this study were measured by self-report scales. This introduces the potential for a mono-method bias. Future research utilizing multiple methods of measurement (e.g., self-report, observational, etc.) for each construct may therefore provide differing results. Lastly, suicide risk assessment can take many

forms. The present study utilized self-report measures of suicide risk that examine numerous important suicide-related constructs. However, suicide risk assessment in a clinical setting often involves examination of additional factors not covered here. Bryan and Rudd (2006) provide an up-to-date overview of recommended suicide risk assessment procedures that may be relevant for readers interested in the process of clinical suicide risk assessment.

### **Definition of Terms**

#### **Suicidal Ideation**

Reynolds (1991) defined suicidal ideation as “ranging from relatively mild general thoughts about death and wishes that one were dead to serious ideation about specific plans and means of taking one’s life” (p. 290). This definition was used in the present study.

#### **Suicide Risk**

Suicide risk can be conceptualized as a combination of factors known to increase the likelihood that one will undertake a serious or life-ending suicide attempt. Within the context of the present study, suicide risk was defined as a combination of suicide ideation as described above and “non-lethal suicide-related behavior...[including]...intentional self-harm, suicide attempts, [and] suicide threat” (Gutierrez & Osman, 2008, pp. 69-70).

#### **Interpersonal-Psychological Theory of Suicide Constructs**

Van Orden et al. (2010) described the three primary constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) as follows:

**Perceived burdensomeness.** For the present study, perceived burdensomeness was defined as, “beliefs that the self is so flawed as to be a liability on others and affectively laden cognitions of self-hatred” (Van Orden et al., 2010, p. 583).

**Thwarted belongingness.** For the present study, thwarted belongingness was defined as, “loneliness and the absence of reciprocally caring relationships” (Van Orden et al., 2010, p. 582).

**Acquired capability for suicide.** Acquired capability for suicide “is composed of both increased physical pain tolerance and reduced fear of death through habituation and activation of opponent processes in response to repeated exposure to physically painful and/or fear-inducing experiences” (Van Orden et al., 2010, p. 585). For the present study, the acquired capability for suicide was defined as the ability to overcome the fear and expectation of pain related to engaging in a suicidal act, often obtained via repeated exposure, either direct or imaginal, to fearful and pain-inducing stimuli or experiences (Joiner, 2005).

### **Attachment Style**

In the present study, the term attachment style was used to refer to the typical ways in which an individual responds to others and the world in which they exist as a result of internal working models developed in early childhood. Consistent with Brennan, Clark, and Shaver's (1998) conceptualization of attachment, attachment styles were defined by high or low levels of the orthogonal factors of attachment anxiety and attachment avoidance.

**Attachment anxiety.** Brennan et al.'s (1998) description of attachment anxiety in adulthood as fear of interpersonal abandonment by those with whom one has a close relationship was used in the current study.

**Attachment avoidance.** The current study utilized Brennan et al.'s (1998) definition of attachment avoidance as “discomfort with closeness [to others] and dependency [on others]” (p. 48).

### Summary

The interpersonal-psychological theory of suicide (Joiner, 2005) presents a new and potentially powerful way of theoretically examining suicide-related behavior and its correlates while attachment theory (Bowlby, 1969) provides a broad framework for conceptualizing aspects of interpersonal relating that impact many areas of one’s life. By examining these theories in unison and working to integrate them, the present study aimed to understand how certain aspects of these two theories interact to affect suicide risk. More specifically, the impact of attachment anxiety and attachment avoidance on factors of the interpersonal-psychological theory of suicide (Joiner, 2005) shown to be related to suicidal behavior were examined. In so doing, this study sought to provide researchers and counseling psychologists with a deeper understanding of the factors that influence suicidal behavior. It is hoped that this knowledge will allow for the identification of new targets for therapeutic assessment and intervention and provide additional evidence related to the utility of already identified therapeutic targets.

This dissertation consists of five chapters. Chapter II provides a detailed review of the literature related to the relationship between attachment anxiety, attachment avoidance, and suicidal behavior; the constructs of the interpersonal-psychological theory

of suicide and their correlates; and how the interrelationships between these factors may differentially impact suicide risk. Chapter III describes the methods to be used for quantitative analysis of study data including a review of the study design, sampling strategy, measurements to be used, study procedures, and data analysis. Chapter IV provides a detailed description of the results of data analyses that are conducted. Chapter V provides a discussion of the study and its results including clinical and research implications, limitations, and directions for future research. Lastly, an appendix (Appendix F) consisting of a completed manuscript intended for submission for publication in a peer-reviewed journal is included.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

The review of relevant literature that follows aimed to provide a theoretical, empirically supported basis for the present study including research questions and proposed hypotheses. The relevant theoretical frameworks of the interpersonal-psychological theory of suicide (Joiner, 2005) and attachment theory were reviewed first, including references to the empirical research. Next, an integration and evaluation of relevant research related to attachment theory and the interpersonal-psychological theory of suicide (Joiner, 2005) was provided. This was followed by a critical examination of literature linking suicide risk with various aspects of the interpersonal-psychological theory of suicide and attachment theory. Lastly, an integration the reviewed information was undertaken in order to present a clear and coherent basis for the present study and provide information related to limitations of this review and implications for future research.

#### **Theoretical Frameworks**

##### **Interpersonal-Psychological Theory of Suicide**

The interpersonal-psychological theory of suicide (Joiner, 2005) is a relatively new theory of suicidal behavior that aims to account both for factors that lead an individual to desire death by suicide and factors that differentiate those who desire death



by suicide from those who undertake a serious suicidal act. For years, researchers have attempted to develop theoretical frameworks for understanding the factors that influence suicidal behavior with varying degrees of success (Baumeister, 1990; Shneidman, 1993; Williams & Pollock, 2000; Williams, 1997). Each of these frameworks provided unique contributions to the field of suicidology. Baumeister (1990) asserted that suicidality came about as a result of an individual's desire to escape from their own self-awareness, suggesting that failures to live up to one's own expectations create a sort of felt inadequacy from which an individual will try desperately to escape and, when unable to do so effectively, may ultimately resort to undertaking a suicidal act. Somewhat similarly, Shneidman's (1993) theory of suicide focused on a concept referred to as psychache, which he described as "hurt, anguish, soreness, aching, psychological *pain* (italics in original) in the psyche" (p. 145). He believed that it was an unbearable level of psychache that led an individual to undertake a suicidal act. Williams's (1997) "cry of pain" model builds on prior models by suggesting that suicidal behavior is, in fact, a result of feelings of entrapment or being unable to escape from external or internal forces in one's life. Per this model, individuals experiencing such feelings are at increased risk for death by suicide. While the models discussed above represent only a sampling of prior theories of suicidal behavior, shared among these and other previous models is a focus on factors underlying the desire to kill oneself, and absent from each is a discussion of what differentiates those who wish to die by suicide from those who actually do die by suicide. That is to say, these models all discuss factors that influence suicidal ideation, but fail to directly address how ideation, even intense ideation, is transformed from thought into action (Van Orden et al., 2010).

There is evidence that prior theorists were aware of this shortcoming in their theories. Shneidman (1993), for instance, indicated that each individual has a specific threshold of psychache or pain which they are able to tolerate, and that it is only when this threshold is exceeded that an individual is likely to undertake a suicidal act. He did not, however, provide any means for further understanding this threshold. In discussing the cry of pain model, Williams and Pollock (2000) asserted that the differentiating factor between deliberate non-suicidal self-harm and an attempt at death by suicide is the degree to which an individual believes they may be able to escape their current felt pain. As with Shneidman, what they seem to be saying is that it is the intensity of feelings that differentiates between ideators and attempters. However, while available data does support a link between suicidal ideation and suicide attempts (Cochrane-Brink, Lofchy, & Sakinofsky, 2000; Hor & Taylor, 2010; Lamis et al., 2014; Miranda, Ortin, Scott, & Shaffer, 2014; R. K. Roberts et al., 1998), this link is largely one of sensitivity (i.e., true positives) rather than specificity (i.e., true negatives).

For instance, Drum, Brownson, Denmark, and Smith (2009) collected data on a stratified sample of over 15,000 undergraduate students from 70 participating US universities and found that, among them, approximately 55% had experienced at least one episode of suicidal ideation in their lives and 18% had seriously considered ending their lives. In spite of this incredibly high prevalence of suicidal ideation, only 8% of students reported having attempted to die by suicide. In another example, the Centers for Disease Control and Prevention (1995) reported that among a sample of 7,442 college students in the United States, 10.3% reported seriously considering a suicide attempt in the 12 months prior to data collection while only 1.5% of students reported undertaking a

suicide attempt and only 0.4% reported attempting suicide in a manner so potentially lethal as to require medical attention. These data provide clear support for the notion that suicidal ideation, no matter the level of severity, is a necessary but by no means sufficient condition for an individual to undertake a suicide attempt.

Further evidence supporting the idea that suicidal ideation in and of itself lacks specificity in differentiating those who wish to die by suicide from those who attempt to die by suicide comes from studies of measures of suicidal ideation. The Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991) is a self-report measure of suicidal ideation. In a study examining the utility of clinical rating scales in the assessment of suicide risk, Cochrane-Brink et al. (2000) found that the BSS could very accurately predict those who would not attempt suicide with a negative predictive value of 100% using a self-determined cutoff score of  $\geq 24$  (total score range of 0-38), but tended to overestimate the number of individuals who would attempt suicide with a positive predictive value of 71%. This discrepancy provides further evidence for the idea that suicidal ideation alone is not adequate for one to undertake a suicidal act.

In order to overcome these deficiencies in prior models of suicidal behavior and provide a means by which clinicians and researchers alike could increase their understanding of the factors that underlie suicidal behavior, Joiner (2005) introduced the interpersonal-psychological theory of suicide. This theory attempts to account for factors that lead an individual to want to die by suicide in the form of two constructs (i.e., thwarted belongingness and perceived burdensomeness) as well as an additional factor that differentiates those who wish to die by suicide from those who undertake a serious suicide attempt, the construct of acquired capability for suicide. Together, these three

constructs are posited by the interpersonal-psychological theory of suicide to underlie suicidal behavior (Joiner, 2005).

Among the three primary constructs of the interpersonal-psychological theory of suicide (Joiner, 2005), those related to the desire to die by suicide, thwarted belongingness and perceived burdensomeness, are perhaps most analogous to Shneidman's (1993) psychache and Williams's (1997) cry of pain. They are also the constructs posited by the interpersonal-psychological theory of suicide (Joiner, 2005) to be most closely linked to suicidal ideation (Van Orden et al., 2010). Specifically, the interpersonal-psychological theory of suicide (Joiner, 2005) suggests that increased levels of thwarted belongingness and perceived burdensomeness should be related to increased levels of suicidal ideation (Van Orden, Cukrowicz, Witte, & Joiner, 2012). Recent research has shown strong intercorrelations between these constructs and there has been some suggestion that any interaction between these constructs may be moderated by other, as yet unidentified variables (Cero, Zuromski, Witte, Ribeiro, & Joiner, 2015). While these two constructs can be understood to be conceptually similar to the constructs posited in Baumeister (1990), Shneidman (1993), and Williams's (1997) earlier theories in that they refer to intrapsychic and often phenomenologically derived phenomena, the construct of acquired capability for suicide sets the interpersonal-psychological theory of suicide (Joiner, 2005) apart in that it provides a direct and measurable means for conceptualizing what differentiates those who want to die by suicide from those who undertake a serious attempt to die by suicide.

The acquired capability for suicide, a construct posited to be closely related to the concepts of fearlessness and increased tolerance for pain (Van Orden et al., 2010),

provides a unique and necessary contribution to the field of suicidology in that it seeks to answer the question, “If emotional pain, hopelessness, emotional dysregulation, or any variable is crucial in suicide, how then to explain the fact that most people with any one of these variables do not die by or even attempt suicide?” (Joiner, 2005, p. 46). Looked at another way, if emotional pain and hopelessness are not enough to lead an individual to undertake a suicidal act, then how do we identify those who not only want to, but can attempt to or actually do die by suicide? This question has been identified as a critical frontier in suicide research moving forward (Klonsky & May, 2013), and the interpersonal-psychological theory provides a unique opportunity for the field of suicidology to begin to find an answer. The interpersonal focus of Joiner’s (2005) interpersonal-psychological theory of suicide suggests that other theories that examine interpersonal interaction may also play an important role in suicide-related behavior. One such interpersonally-relevant theory is John Bowlby’s (1969) attachment theory.

### **Attachment Theory**

Bowlby (1969) introduced attachment theory as a means of conceptualizing the importance of the early parent-child relationship in the development of children’s personalities and interpersonal styles. A main component comprising this theory is the idea that the relationship that a child develops with a primary caregiver in infancy influences the development of internal working models (Bowlby, 1969). These internal working models can be thought of as systems through which an individual can organize and interpret information about the self, others, and the outside world as a whole (Bowlby, 1969). Once established, these internal working models tend to function in a rather automatic manner and therefore serve to color an individual’s experiences of the

world, impacting not only how one thinks about the self and others, but how one reacts behaviorally to the self and others as well (Bowlby, 1969).

As noted, Bowlby (1969) indicated that the development of internal working models occurs within the context of an infant's relationship to his or her mother (or a primary caregiver). Because children are essentially defenseless at birth, they necessarily rely on the presence of a caregiver for safety and security. When a caregiver is unavailable, the infant is likely to experience a great deal of worry and anxiety and to respond by engaging in what are called attachment behaviors, or behaviors that are meant to strengthen the relationship between infant and caregiver (Marvin & Britner, 2008). Early in life, these attachment behaviors tend to take the form of proximity-seeking behaviors meant to keep the caregiver close by. An example of such behavior is crying intended to elicit not only the attention of the primary caregiver, but an anxiety reducing reaction from the primary caregiver as well (Bowlby, 1969). In contrast to these more negatively perceived proximity-seeking behaviors, an infant may seek to maintain proximity to a caregiver through the use of smiling, cooing, or other behaviors that are reinforcing to the caregiver (Bowlby, 1969).

Ainsworth (1973) noted that the patterns of behavior an infant shows are closely related to the responsiveness to proximity-seeking and other behaviors by, and the general warmth of, the infant's mother, the individual most likely to be serving as the primary caregiver for an infant even today. Her research showed that mothers who were warmer, more responsive, and more sensitive to the needs of their children tended to have children who were more responsive to the mother's attempts to soothe and calm them. These observations were further developed into the concept of attachment styles, or

prototypical ways in which an individual responds to others or to the environment as a whole. Ainsworth et al. (1978) initially posited the presence of three different attachment styles: secure, insecure-ambivalent (a style now commonly referred to as anxious), and insecure-avoidant. A fourth style of attachment referred to as insecure-disorganized/disoriented was identified by Main and Solomon (1986). Each of these attachment styles was initially described within the context of the strange situation procedure developed by Ainsworth and colleagues (Ainsworth, 1973). As part of this procedure, children were repeatedly separated from their primary caregiver and joined by a caring stranger, only to have the caregiver return after a short period of absence. Children's behavior was monitored and classified and the pattern of responding to separation, time spent with a stranger, and reunion with the primary caregiver was used to identify a child's particular attachment style.

Children classified as securely attached tended to greet their primary caregiver when they returned after a short separation and to in general be easily soothed by their primary caregiver (Main & Solomon, 1986). These children also tended to be willing to explore their environment safe in the knowledge that their primary caregiver would be available to them should their sense of security be threatened. Children classified as having an insecure-avoidant attachment style tended to be resistant to or avoidant of their primary caregiver upon return from a short separation (Main & Solomon, 1986). These children seemed to show a milder response to separation and to be focused on exploration at the expense of security or proximity seeking. Children classified as having an insecure-ambivalent (i.e., anxious) attachment style tended to display heightened levels of distress throughout the strange situation and to show variability in proximity-seeking attachment

behaviors in the context of often resisting soothing by the primary caregiver (Main & Solomon, 1986). These children displayed behaviors suggestive of over-dependence on their primary caregiver including an exaggerated reaction to separation and overt display of proximity-seeking behaviors at the expense of exploration. Children classified as insecure-disorganized/disoriented tended to show a number of behaviors that lacked both internal consistency and consistency with behaviors present in the other identified attachment styles (Main & Solomon, 1986). These children tended to display an inconsistent mix of avoidance and proximity-seeking behaviors and at times seemed to engage in contradictory behaviors simultaneously, to be hesitant when engaging in proximity-seeking behaviors at times resulting in the initiation of a proximity-seeking behavior that was not completed, and to appear confused and unsure when their primary caregiver returned after a brief separation.

While evidence related to the development of infant attachment styles is plentiful (Ainsworth et al., 1978; Ainsworth, 1973; Bowlby, 1973; Frederick & Goddard, 2008; Hesse & Main, 2000; Main & Solomon, 1986; Main, 2000; Waters et al., 2000), what happens to these styles as an individual ages has been a source of controversy of late (Fraley, 2002). Bowlby (1973) stated that an individual's patterns of behavior related to attachment should be relatively stable over time, though he also acknowledged that internal working models that underlie attachment styles, like any useful model, must be open to some level of revision based on experiences (Bowlby, 1969). Recently, some researchers have begun to question the idea that there is a stable component to attachment styles and a split has developed between those who take a revisionist perspective focused on the instability of attachment styles over time and those who take a prototypic



perspective that, much like Bowlby did (1969, 1973), focuses on the idea that while change does occur, any variability in attachment style over time is related to an unchanging underlying factor (Fraley, 2002). Evidence has been found supporting both views.

Lewis et al. (2000) examined the consistency of attachment from one year of age to age 18 among a group of 84 individuals and found that attachment style classification as determined through the use of a modified strange situation procedure at age one was not significantly related to attachment style classification as determined through the use of an interview procedure at later dates. However, and as noted by the authors, the methods used to classify participants' attachment styles were generally non-standard and did not conform to best practices, raising questions about the validity of the results. Nonetheless, the authors argue that their methods, while non-standard, had been previously validated in other research and therefore would be likely to provide for accurate classification. An additional limitation of this study was the use of only two attachment style classifications: secure and insecure. By forgoing the more fine-grained classification system based on four styles, the researchers may have inadvertently masked stability within specific insecure attachment styles.

Other researchers have found evidence supporting the stability of attachment style. Waters et al. (2000) conducted a 20-year longitudinal study examining attachment style stability over time among a group of 50 individuals. Participants were assessed at age one using a standard administration of the strange situation procedure and again between ages 20 and 21 using Main and Goldwyn's (1994) rating system for the adult attachment interview (George, Kaplan, & Main, 1985). Their findings, which examined

the three attachment styles initially identified by Ainsworth et al. (1978), indicated that attachment style is, in fact, a stable trait over time.

In an effort to make sense of these and other contradictory results, Fraley (2002) conducted a meta-analysis reviewing results from 27 different samples for whom test-retest data related to attachment style was available leading to an overall sample of 1,410 individuals. His results indicated that the available data on stability of attachment style was more consistent with the prototypic perspective than with the revisionist perspective, suggesting that there is indeed a stable, underlying trait influencing attachment behavior. A more recent study by Fraley et al. (2011) aimed specifically to further assess which of the prototypic and revisionist perspectives of attachment stability best explained patterns of variability in attachment style. This study utilized two samples and included a total of 591 individuals, 203 of whom had their attachment style assessed daily for 30 days and 388 of whom had their attachment style assessed weekly for one year. Results again indicated that the prototypic approach to attachment style stability in which a stable factor underlies any variability in attachment behavior was most consistent with the data. Further, the researchers found that attachment style stability was similar to the stability of the big five personality traits. Taken together, the available research provides a strong argument for Bowlby's (1973) conceptualization of a relatively stable attachment style with allowances for some level of variation over time.

More recently, researchers have developed new approaches to assessing attachment styles in adults based on the levels of two dichotomous traits. This approach was first used by Bartholomew and Horowitz (1991) who identified four attachment styles among young adults based on the positivity and negativity of an individual's view

of self and view of others. Within this model, individuals with a more positive view of both the self and others were classified as secure, individuals with a negative view of self and positive view of others were classified as preoccupied, individuals with a positive view of self and a negative view of others were classified as dismissing, and individuals with a negative view of both the self and others were classified as fearful.

Brennan et al. (1998) adapted this two-trait model, maintaining the four attachment styles identified by Bartholomew and Horowitz (1991) while changing the traits used to classify them. Within Brennan et al.'s (1998) model, attachment styles can be differentiated based on higher or lower levels of attachment anxiety and attachment avoidance. Along these two continua, individuals with low anxiety and low avoidance are classified as secure, individuals with high anxiety and low avoidance are classified as preoccupied, individuals with low anxiety and high avoidance are classified as dismissing, and individuals with high anxiety and high avoidance are classified as fearful. A visual representation of Brennan et al.'s (1998) model is provided in Figure 2. These four styles can be roughly mapped to the secure, insecure-ambivalent, insecure-avoidant, and insecure-disorganized/disoriented styles identified previously among infants (Ainsworth et al., 1978; Main & Solomon, 1986).

Attachment style has been shown to play an important role in numerous aspects of individual and interpersonal functioning. This includes aspects such as self-esteem and social self-efficacy (Rice & Cummins, 1996), marital and sexual satisfaction (Milad, Rivera Ottenberger, & Huepe Artigas, 2014), and interpersonal trust and loneliness (Givertz, Woszidlo, Segrin, & Knutson, 2013), among others. The diversity and pervasiveness of these areas provides strong evidence for the importance of attachment

style in influencing not only inter-individual processes, but intra-individual processes as well.

### **Suicidal Ideation and Suicide Risk**

Suicidal ideation is a well-established suicide-related risk factor (Joiner, 2005) that is highly sensitive if rather low in specificity (e.g., Cochrane-Brink et al., 2000; Drum et al., 2009). Within the context of the interpersonal-psychological theory of suicide (Joiner, 2005), suicidal ideation is conceptualized as a necessary, but not sufficient, aspect of severe risk for suicide. This is consistent with research that has repeatedly shown that suicidal ideation is common among numerous populations of individuals who either have made or will make an attempt to die by suicide (Beck, Brown, & Steer, 1997; Beck, Kovacs, & Weissman, 1979; Brown et al., 2000; Miller, Norman, Bishop, & Dow, 1986; Way, Miraglia, Sawyer, Beer, & Eddy, 2005), and with the fact that high levels of suicidal ideation have been implicated in determining the need to perform an in-depth suicide risk assessment (Reynolds, 1991). So important is the construct of suicidal ideation within the field of suicidology that in a 2007 revision to suicide-related nomenclature for use in disseminating research and information related to suicide, the authors put forth 15 different descriptors for differentiating between the types of suicide-related thoughts an individual may experience (Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007).

Further evidence for an inextricable link between suicidal ideation and suicide risk can be obtained from the content of self-report scales intended to measure risk for suicide which inevitably contain items related to suicidal ideation. For instance, the Suicide Behavior Questionnaire-Revised (SBQ-R; Osman et al., 2001) inquires about

both past and current thoughts related to suicide while the Self-Harm Behaviors Questionnaire (SHBQ; Gutierrez & Osman, 2008) has items related to thoughts about wanting to die or kill oneself. Further, the Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991), which, as its name suggests assesses self-reported levels of suicidal ideation, is frequently used as one part of a comprehensive assessment of suicide risk by researchers (Cochrane-Brink et al., 2000; Ellis, Green, Allen, Jobes, & Nadorff, 2012; Hawkins et al., 2014; Horon, McManus, Schmollinger, Barr, & Jimenez, 2013). Taken together, this presents strong evidence not only for the relationship between suicide risk and suicidal ideation, but for the inherent role of assessing for suicidal ideation in assessing suicide risk, as well.

### **Theoretical Integrations**

Both the interpersonal-psychological theory of suicide (Joiner, 2005) and attachment theory provide methods for understanding the important role that interpersonal interaction plays in an individual's functioning. Attachment theory provides a means of conceptualizing interpersonal functioning at a general level, while the interpersonal-psychological theory of suicide (Joiner, 2005) is concerned with interpersonal functioning in a much more specific context, that of suicide-related thoughts and behaviors. The fact that attachment theory has been shown to be widely applicable in day-to-day life (Mikulincer & Shaver, 2007; Shaver & Mikulincer, 2014) suggests that it is likely to play a role in suicide-related behavior as well. Further, the fact that the interpersonal-psychological theory of suicide (Joiner, 2005) focuses heavily on constructs that are dependent on the results of interpersonal perceptions suggests that suicide-related behaviors are likely to be affected by attachment style. It is therefore

theoretically likely that the constructs of attachment and the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) are interrelated. For example, individuals who experience high levels of attachment anxiety fear that the important others in their lives will leave them or not be available when they are needed (Brennan et al., 1998) and are therefore likely to be highly attentive to any perceptions of interpersonal difficulty. This would theoretically make them more likely to experience feelings of perceived burdensomeness and thwarted belongingness, both interpersonally charged constructs (Van Orden et al., 2010). In contrast, individuals who experience high levels of attachment avoidance tend to be uncomfortable in close relationships with others (Brennan et al., 1998) and therefore are less likely to desire closeness to others, potentially making them less susceptible to experiencing the aversive interpersonal emotions inherent in experiences of perceived burdensomeness and thwarted belongingness. In spite of the theoretical likelihood of the relationship between these two theories, there is currently a dearth of empirical literature examining them in unison.

To date, no published research has directly explored the relationship between attachment style and the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005). However, indirect evidence in the form of studies examining the link between attachment and closely related constructs thought to underlie feelings of perceived burdensomeness and thwarted belongingness such as self-hate (e.g., Arbona & Power, 2003; Gomez & McLaren, 2007) and loneliness (e.g., Berlin, Cassidy, & Belsky, 1995; Givertz et al., 2013) is available. By examining this indirect evidence, it is possible to theoretically integrate constructs of attachment with constructs of the interpersonal-psychological theory of suicide (Joiner, 2005).

### **Attachment Anxiety and Perceived Burdensomeness**

Perceived burdensomeness can be thought of as being made up of two underlying constructs: self-hate and the feeling that one is a liability to other important people in one's life. The construct of self-hate can be further subdivided into the concepts of low self-esteem, self-blame or shame, and agitation (Van Orden et al., 2010). The link between attachment anxiety and low self-esteem has been well established in the literature. For example, Arbona and Power (2003) found that anxious attachment towards a father figure was negatively related to levels of self-esteem among a sample of 791 adolescents of European-American, African-American, and Mexican-American descent. In another study involving 225 undergraduate college students, attachment anxiety was found to have a significant negative correlation with self-esteem ( $r = -.28, p < .01$ ) as measured by self-report instruments (Roberts, Gotlib, & Kassel, 1996). A more recent study involving 350 adolescents, the majority of whom identified as white, provides additional evidence for this link, with the researchers again finding a significant negative correlation between attachment anxiety and self-esteem ( $r = -.60, p < .001$ ; Lee & Hankin, 2009).

Similar, if less ample, evidence is available for the link between attachment anxiety and shame. Wei, Shaffer, Young, and Zakalik (2005) examined, among other things, the link between shame and attachment anxiety among a sample of 299 undergraduate students in the United States. Their results showed a large correlation ( $r = .60, p < .001$ ) between these two constructs. Unfortunately, the research base examining the relationship between attachment anxiety and shame is currently rather thin. Further,

there are not currently any published studies examining the link between attachment anxiety and agitation, the final aspect of self-hate.

With regards to attachment anxiety and feelings that one is a liability, research is largely non-existent at this time. However, Kowal, Wilson, McWilliams, Peloquin, and Duong (2012) examined the relationship between attachment styles and self-perceived burden, a construct they noted to be closely related to the construct of perceived burdensomeness. Their findings indicated a significant correlation between attachment anxiety, but not attachment avoidance ( $r = .12, p > .05$ ), and feelings by participants that they were a burden on others ( $r = .23, p < .001$ ).

In addition to indirect evidence for a link between attachment anxiety and perceived burdensomeness, a theoretical connection between these two constructs can also be made. By definition, individuals who are high in attachment anxiety tend to experience high levels of worry and insecurity in their relationships with others. These individuals have also been shown to attend more closely to negative emotional cues than to positive ones (Shaver & Mikulincer, 2014). As such, it is reasonable to expect that they would be more apt to feel that they are a burden on others in their lives regardless of the accuracy of such an appraisal as they would be more likely to pick up on any negative cues and to react aversively to such cues. In addition to its relationship to constructs similar to perceived burdensomeness, attachment anxiety has also been shown to be related to concepts closely connected with the construct of thwarted belongingness.

### **Attachment Anxiety and Thwarted Belongingness**

Like perceived burdensomeness, thwarted belongingness can be conceptualized as being made up of two underlying constructs: loneliness and the lack of reciprocal care



(Van Orden et al., 2010). The link between loneliness and attachment anxiety has been repeatedly confirmed in the literature among various age groups. In a study examining the link between loneliness and attachment style in young children, Berlin et al. (1995) found that children classified as having an insecure-ambivalent attachment style, which can be conceptualized as being high in attachment anxiety, were more likely to experience heightened levels of loneliness than were their securely attached or insecure-avoidantly attached peers.

Studies with undergraduate college students have found similar results. Feeney (2006) found that undergraduate students who reported high levels of relationship anxiety with regards to their parents were also more likely to experience heightened degrees of loneliness (mother relationship anxiety  $r = .22$ , father relationship anxiety  $r = .30$ ). Pereira, Taysi, Orcan, and Fincham (2013) also examined the link between attachment anxiety and loneliness among 345 undergraduate students, but restricted their sample to students who were actively involved in romantic relationships. As with the previous study, results showed a significant correlation between these two constructs ( $r = .376$ ).

These results are also consistent with findings among married couples. Givertz et al. (2013) examined the relationship between attachment style and loneliness in a sample of 225 heterosexual couples. They found a positive correlation between attachment anxiety and loneliness among both husbands ( $r = .57$ ) and wives ( $r = .56$ ). Similarly, Knoke, Burau, and Roehrlé (2010) found that attachment anxiety was positively correlated with both emotional ( $r = .56$ ) and social ( $r = .363$ ) loneliness among a sample of 63 heterosexual couples. Together, this research provides a strong base for the idea that attachment anxiety and loneliness are interrelated.

While studies directly examining lack of reciprocal care are currently lacking, Van Orden et al. (2010) noted that lack of reciprocal care can be conceptualized in part as related to the experience of childhood abuse. Researchers, in turn, have found a link between the development of a disorganized attachment style and childhood maltreatment. For example, Stronach et al. (2011) examined attachment styles among a sample of 123 preschool-aged children, 92 of whom had experienced maltreatment. Their findings indicated that among the maltreated group only, the plurality of participants (42.4%) had a disorganized attachment style. This finding indirectly supports the link between childhood maltreatment and attachment anxiety in that individuals with a disorganized attachment style are conceptualized as being high in both attachment anxiety and attachment avoidance (Brennan et al., 1998). Evidence related to the lasting impact of childhood abuse on attachment style is sparse at present. However, in one recent study Brassard, Darveau, Pélouquin, Lussier, and Shaver (2014) found a significant positive correlation between childhood sexual abuse and attachment anxiety ( $r = .17, p < .01$ ) among a sample of 302 adult men.

Taken together, this indirect evidence provides strong support for a link between attachment anxiety and the construct of thwarted belongingness. Further, these constructs can be theoretically linked. The heightened levels of interpersonal insecurity experienced by individuals with high levels of attachment anxiety could reasonably be expected to lead to feelings related to a lack of belonging in that these individuals would be likely to frequently question whether and how completely they have been accepted by those with whom they interact socially.

### **Insecure Attachment and Acquired Capability for Suicide**

Researchers have so far not examined the link between insecure attachment and the acquired capability for suicide directly. It is, however, possible to link these two constructs conceptually by examining the predictions of the interpersonal-psychological theory of suicide (Joiner, 2005) and research related to childhood abuse, attachment styles, and suicide-related behaviors. Van Orden et al. (2010) explicitly discuss the theoretical link between the experience of childhood maltreatment and the construct of acquired capability for suicide. This is a reasonable theoretical link in that acquired capability for suicide is conceptualized as being comprised of fearlessness of death and a heightened tolerance for physical pain. Joiner (2005) notes that this heightened tolerance for physical pain comes about as part of a habituation process in which repeated pain exposure increases pain tolerance, further indicating that threats of pain can have a similar effect. Because experiences of real or threatened pain are an inherent part of childhood abuse and maltreatment, a link between the two can be hypothesized.

In order to move from a theoretically possible relationship between these two constructs to one that has at least indirect evidentiary support, it is necessary to examine the link between childhood maltreatment and insecure attachment. While discussion has so far focused primarily on attachment anxiety, research suggests that insecure attachment styles in general, and disorganized or fearful attachment styles in particular, are more likely to be linked to childhood abuse than is attachment anxiety in particular. For instance, Baer and Martinez (2006) conducted a meta-analysis of eight studies examining the link between childhood maltreatment and attachment, obtaining an overall sample of 791 participants. Their results indicated that children who had experienced

maltreatment were much more likely (80%) than their non-maltreated peers (36%) to have an insecure attachment style. In another example, van Ijzendoorn, Schuengel, and Bakermans-Kranenburg (1999) reviewed five studies examining the link between childhood maltreatment and disorganized attachment, obtaining a total sample size of 323. Their results indicated that approximately 48% of children who experienced maltreatment developed a disorganized attachment style compared to only 17% of children who had not experienced childhood maltreatment. This link between childhood maltreatment and insecure attachment provides a foundation for conceptualizing how insecure attachment and the acquired capability for suicide are related. In order to complete this proposed integration, however, it is necessary to next examine evidence for a link between childhood maltreatment and suicide-related behaviors.

Hadland et al. (2012) examined suicide attempts among a sample of 495 “street youths,” the majority of whom were homeless, who had experienced childhood trauma in general and childhood physical and sexual abuse in particular. Their results indicated that childhood maltreatment was associated with an increased risk of suicide attempt with an adjusted odds ratio (OR) of 1.45 after accounting for confounding variables. This indicates that the likelihood of undertaking a suicide attempt is 1.45 times greater among individuals who have a history of childhood maltreatment than it is among individuals who have not experienced childhood maltreatment. Perales, Gallaway, Forys-Donahue, Spiess, and Millikan (2012) examined the relationship between childhood trauma, including abuse and family problems, among a sample 995 United States Army soldiers who engaged in suicidal behavior including attempts ( $n = 831$ ) and death by suicide ( $n = 164$ ) between 2005 and 2010. Their results indicated that 64.7% of those who attempted

suicide and 43.3% of those who died by suicide had experienced childhood trauma. This provides strong evidence for a link between childhood maltreatment and suicide-related behaviors.

Taken together, data linking childhood maltreatment to both insecure attachment and suicide-related behavior provides a reasonable argument for a link between attachment styles and suicidal behavior that may be mediated at least in part by the construct of acquired capability for suicide. The interpersonal-psychological theory of suicide (Joiner, 2005) includes hypotheses related to the development of acquired capability for suicide suggesting that childhood maltreatment is a viable pathway through which acquired capability for suicide can develop, and evidence reviewed here suggests the presence of a relationship between experiences of childhood maltreatment and both the development of insecure attachment and future risk for suicide. This allows for a theoretical link between the construct of acquired capability for suicide and insecure attachment to be posited. Having examined the link between attachment constructs and the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005), evidence for the link between constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) and suicide-related behaviors was examined next.

### **Perceived Burdensomeness and Suicide Risk**

Perceived burdensomeness, one of the three primary constructs of the interpersonal-psychological theory of suicide (Joiner, 2005), has been defined as “beliefs that the self is so flawed as to be a liability on others and affectively laden cognitions of self-hatred” (Van Orden et al., 2010, p. 583). Several researchers have provided evidence for a direct link between the construct of perceived burdensomeness and suicide-related

behaviors. Van Orden et al. (2006) examined the link between perceived burdensomeness and suicidal ideation among a sample of 343 adult outpatients utilizing a single item self-report measure of burdensomeness, a notable limitation to their study. Their results indicated a significant positive correlation between these two constructs ( $r = .32, p < .05$ ) and simultaneously showed that perceived burdensomeness accounted for approximately 2% more variance in suicidal ideation than did age, gender, presence of a personality disorder, degree of depression, and degree of hopelessness as measured by a single item self-report measure combined. This relationship has been further confirmed by an additional study examining the link between perceived burdensomeness and suicidal ideation among undergraduate students that utilized the current version of the Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012), a self-report measure designed to assess perceived burdensomeness and thwarted belongingness (Van Orden, Witte, Gordon, Bender, & Joiner, 2008). The researchers found that individuals experiencing heightened levels of perceived burdensomeness were more likely to also be experiencing suicidal ideation than those experiencing lower levels of perceived burdensomeness ( $OR = 2.21, p < .01$ ).

This relationship has also been found among geriatric and military populations. Jahn and Cukrowicz (2011) examined the connection between interpersonal relationships, perceived burdensomeness, and suicidal ideation among a sample of 70 older adults with a mean age of 72.79 ( $SD = 6.56$ ). As part of their analysis, they found a significant positive correlation between perceived burdensomeness and suicidal ideation ( $r = .59, p < .01$ ). Among 88 active duty enlisted military personnel, Bryan, Morrow, Anestis, and Joiner (2010) found that feelings of perceived burdensomeness correlated highly ( $r = .56,$

$p < .01$ ) with a self-report measure of suicide risk. Similar results were found among a sample of 443 United States military veterans (Pfeiffer et al., 2014) with researchers finding that perceived burdensomeness was a significant predictor of passive, but not active, suicidal ideation ( $\beta = 0.14, p = .01$ ).

In addition to this more direct evidence for a link between perceived burdensomeness and suicidal ideation, indirect evidence is also available. As noted by Van Orden et al. (2010), the construct of perceived burdensomeness can be further subdivided into feelings of self-hate and feelings that one is a liability to others. Self-hate can be conceptualized as strong feelings of disgust or dislike towards one's self, and can be further divided into the constructs of low self-esteem, self-blame or shame, and general agitation (Van Orden et al., 2010).

The link between low self-esteem and suicide-related behaviors has been demonstrated among various populations. Overholser et al. (1995) examined the link between self-esteem and suicidal tendencies among a sample of 542 adolescents, 254 of whom were inpatients at a psychiatric hospital and 288 of whom were recruited as part of a high school comparison group. Their findings indicated that individuals with lower levels of self-esteem were much more likely than their peers with higher levels of self-esteem to be experiencing current suicidal ideation. On a more global level, Chatard, Selimbegovic, and Konan (2009) examined levels of self-esteem and corresponding suicide rates using data from 55 countries around the world. Their findings indicated that higher self-esteem at the population level was associated with lower suicide rates.

Evidence has also supported the presence of a relationship between feelings of shame and suicidal ideation. You, Talbot, He, and Conner (2012) found a significant link

between shame-proneness and both self-reported and observer-rated suicidal ideation among a sample of 106 women who had histories of childhood sexual abuse. This link was present even after controlling for other factors commonly associated with suicidal ideation such as PTSD symptomatology and prior suicide attempts. Wong, Kim, Nguyen, Cheng, and Saw (2014) examined the relationship between shame and suicidal ideation among a sample of 476 Asian American undergraduate students. Their results, too, indicated a positive correlation between shame and suicidal ideation ( $r = .54, p < .001$ ). Bryan, Morrow, Etienne, and Ray-Sannerud (2013) found a similar correlation between shame and suicidal ideation among a sample of 69 military personnel receiving services at outpatient mental health clinics ( $r = .41, p < .01$ ). This evidence is also consistent with data indicating that individuals who have been diagnosed with borderline personality disorder, a population that experiences feelings of shame at rates much higher than those of the general population (Rizvi & Linehan, 2005), have suicide rates up to 50 times higher than that of the general population (Workgroup on Borderline Personality Disorder, 2001).

While evidence is sparser, agitation, too, has been linked to increased levels of suicidal behavior. Busch et al. (2003) conducted a retrospective chart review of 76 individuals who died by suicide while inpatients at a psychiatric hospital. Among these 76 individuals, the researchers found that 38 (50%) showed clinically elevated levels of agitation within one week prior to their eventual death. Way, Miraglia, Sawyer, Beer, and Eddy (2005) found similar results in examining medical records for 76 individuals incarcerated in the state of New York who died by suicide between the years of 1993 and



2001, with 70% reportedly exhibiting heightened levels of agitation-related behaviors prior to their death.

Much like the construct of self-hate can be subdivided further into constructs of low self-esteem, self-blame or shame, and general agitation, the concept of feeling that one is a liability to others can be broken down into three smaller constructs: the belief that one is a burden to close others, the belief that one is expendable or unwanted, and distress related to specific life events (Van Orden et al., 2010). The belief that one is a burden to close others has been found to reliably differentiate individuals with a history of suicide attempts from those with no such history (Van Orden et al., 2006). Woznica and Shapiro (1990) examined the link between the belief that one is expendable and suicidal ideation among a sample of 40 adolescents. Their findings indicate that adolescents who were rated by their therapists as having more feelings of expendability were also rated by their therapists as having higher levels of suicidality. Further, research discussed above related to the link between childhood maltreatment and suicide risk (e.g., Hadland et al., 2012; Perales et al., 2012) is also relevant within the context of this construct of expendability in that individuals who suffer maltreatment as children may internalize a view of themselves as unloved or unwanted by important others in their lives who have mistreated them.

Distress related to life events includes such things as unemployment, incarceration, homelessness, and the presence of severe illness, all of which may lead an individual to feel that they are a burden on important others (Van Orden et al., 2010). Brown et al. (2000) found that approximately 49% of 47 outpatient psychiatry patients who died by suicide were unemployed compared to less than 22% of 5,984 outpatient

psychiatric patients who did not die by suicide during a 20-year prospective study. An investigation by Haw, Hawton, and Casey (2006) into deliberate self-harm, a behavior closely linked to suicide and suicidal ideation, found that homeless individuals were more likely to have recurrences of self-harm behaviors than were their peers with a fixed residence. In examining the link between chronic pain and suicidal ideation, researchers found that the perception of burdensomeness was a significant predictor of suicidal ideation in a model containing age, gender, pain severity, and depressive symptoms, among others (Wilson, Kowal, Henderson, McWilliams, & Péloquin, 2013), suggesting that any link between chronic pain and suicidal ideation relies at least in part on the presence of feelings of burdensomeness.

In spite of Van Orden et al.'s (2010) hypothesis to the contrary, current evidence does not support a link between increased levels of suicidal ideation and incarceration status. For example, Carli et al. (2010) found lifetime prevalence of suicidal ideation to be approximately 42% among a sample of 1265 individuals being held in Italian penitentiaries. This can be compared to findings from Drum et al. (2009) indicating that approximately 55% of undergraduate students and 51% of graduate students from samples of 15,010 and 11,441 undergraduate and graduate students, respectively, have experienced suicidal ideation. The reasons for this lack of relationship are unclear at this time. In spite of this, there is strong overall empirical support, both direct and indirect, for a link between perceived burdensomeness and suicide risk.

### **Thwarted Belongingness and Suicide Risk**

Thwarted belongingness, the second of the three primary constructs of the interpersonal-psychological theory of suicide (Joiner, 2005), has been defined as feelings

of “loneliness and the absence of reciprocally caring relationships” (p. 582). Researchers have provided preliminary direct evidence for a relationship between thwarted belongingness and suicide risk. Van Orden et al. (2012) examined the relationship between thwarted belongingness and suicidal ideation among a sample of 254 undergraduate students in the United States and found that individuals who were experiencing elevated levels of thwarted belongingness had significantly higher odds of also experiencing suicidal ideation ( $OR = 1.59, p < .01$ ).

Other researchers have examined the correlation between levels of thwarted belongingness and suicidal ideation. For example, Hawkins et al. (2014) administered self-report measures of thwarted belongingness and suicidal ideation to a sample of 215 adult outpatients at a community clinic in the southeastern United States. Their results showed a significant positive correlation between these two constructs ( $r = .44, p < .001$ ). Another study utilizing a larger community sample ( $n = 6,133$ ) from Australia also found a significant correlation between these two constructs as measured by self-report ( $r = .21, p < .001$ ; Christensen et al., 2013). Further, there is empirical evidence for a link between thwarted belongingness and suicidality among military personnel. Bryan, Hernandez, Allison, and Clemans (2013) administered self-report measures of thwarted belongingness and suicidality to a sample of 348 active duty US Air Force personnel and found a significant correlation ( $r = .18, p < .01$ ).

In addition to this more direct evidence, indirect evidence for a link between thwarted belongingness and suicide risk is also available. As noted by Van Orden et al. (2010), thwarted belongingness can be conceptualized as being made up of two sub-constructs: loneliness and the lack of reciprocal care. Of these, loneliness has been most

strongly linked to suicide-related behaviors. Dieserud et al. (2001) found a correlation between self-reported loneliness and suicidal ideation ( $r = .30, p < .01$ ) among a sample of 72 individuals who had recently attempted suicide and 51 psychiatric outpatients.

Roberts et al. (1998) examined the same relationship among a sample of adolescents in the southern United States. Their results indicated that individuals experiencing elevated levels of loneliness had a higher likelihood of also experiencing suicidal ideation (OR = 1.81,  $p < .001$ ) than did non-lonely peers.

Stravynski and Boyer (2001) examined the relationship between loneliness and suicidal ideation at a national level utilizing data from a sample of 19,724 individuals living in Canada aged 15 years or older. Their results indicated that those who expressed frequent feelings of loneliness had a much higher risk of experiencing suicidal ideation (OR = 10.5) and having engaged in a prior suicide attempt (OR = 13.5) than did participants who did not endorse this level of loneliness. Among the elderly, Waern et al. (2003) found that experiences of loneliness were related to increased risk of death by suicide among a sample of 238 Swedish nationals, 85 of whom died by suicide. Their results indicated higher risk both for individuals aged 65-74 years (OR = 4.6,  $p = .03$ ) and individuals aged 75 years and older (OR = 3.7,  $p = .04$ ).

Martin et al. (2013) took a more qualitative approach to assessing the relationship between thwarted belongingness, loneliness, and suicide. These researchers examined reports on 100 deaths by suicide among United States Air Force personnel. Their results indicated that both loneliness and thwarted belongingness were primary themes communicated by these individuals prior to their death. Additional indirect evidence for

the effect of loneliness on suicidality comes from studies examining a post-crisis intervention with depressed or suicidal individuals.

Motto and Bostrom (2001) studied a sample of 843 individuals who had been hospitalized due to depressive symptoms or suicidality. They randomly divided this sample into two groups, one of which received a short letter from members of the research team four times a year for five years that expressed concern for the individual's well being and reminded the individual of the availability of mental health services. The other group received no further contact from the research team. Their results indicated that the number of suicides among individuals in the group receiving these short letters was lower than the number of suicides in the group that did not receive letters over a span of five years. The authors concluded the contact with these individuals played a preventative role, thereby suggesting that reduced loneliness was an important factor in preventing suicide.

There is currently no published empirical research examining the link between a lack of reciprocal care and suicide risk. Van Orden et al. (2010) defined relationships with reciprocal care as “ones in which individuals both feel cared about and demonstrate care of another” (p. 582). While there is no research directly supporting this link at present, Baumeister and Leary (1995) suggested that reciprocity in interpersonal relationships is a core aspect of what leads people to feel that they belong. In spite of this apparent empirical shortcoming, overall, there is a great deal of evidence, both direct and indirect, supporting a link between the construct of thwarted belongingness and suicidality.

### **Acquired Capability for Suicide and Suicide Risk**

The construct of acquired capability for suicide has been conceptualized as being comprised of both increased tolerance for pain and reduced fear of death which are believed to come about via a habituation process facilitated by repeated exposure to painful or fear-inducing stimuli (Van Orden et al., 2010). Within the interpersonal-psychological theory of suicide (Joiner, 2005), this construct is thought to answer the question of who is capable of dying by suicide, and in so doing provide a means of differentiating those that have thoughts or desires related to death by suicide from those who undertake a serious suicide attempt. This ability to differentiate between those who progress from thoughts to attempts and those who do not was identified by Klonsky and May (2013) as a critical frontier in the suicidology literature. The interpersonal-psychological theory was suggested as a theory attempting to address this need for differentiation.

Because the acquired capability for suicide is defined as habituation to fear and pain and because suicide is an inherently fear-inducing and often painful experience, perhaps the most powerful evidence for the link between acquired capability for suicide and suicide risk is the well-established relationship between past and future suicide attempts. Specifically, Brown et al. (2000) utilized a prospective design to identify factors that differentiated individuals within a sample of 6,891 psychiatric outpatients who died by suicide over a 20 year period from those who did not. Their results indicated that 55% of individuals who died by suicide in this time frame had undertaken at least one prior suicide attempt, while only 10% of those who did not die by suicide had similarly experienced at least one prior attempt. Further, the lower limit of the 95%

confidence interval for the hazard ratio for prior suicide attempts within this study was higher than that for any other variable examined.

Results similar to those described above have been noted among inpatient samples. Busch et al. (2003) conducted post-mortem chart reviews of 76 inpatients who died by suicide and found that 49% of them had a history of prior suicide attempts, though no control group was available for comparison. In another study among a sample of 73 psychiatric inpatients, Leon et al. (1990) found that each prior suicide attempt individuals experienced increased their relative risk for a future suicide attempt by 32%. High rates of prior attempts have also been found among individuals who die by suicide in prison, with prevalence rates ranging from 45% to 64% (Way et al., 2005).

While prior suicide attempts have been shown to increase levels of acquired capability for suicide (Van Orden, Witte, Gordon, et al., 2008) with individuals with one prior suicide attempt having higher levels of acquired capability for suicide than those with none and individuals with more than one prior attempt in turn having higher levels of acquired capability for suicide than those with one, the interpersonal-psychological theory of suicide (Joiner, 2005) posits additional methods for the acquisition of this capability. It is therefore important to examine the relationship between suicide risk and this construct as a whole instead of restricting this review solely to the presence of past suicide attempts. Researchers have done just that via the use of the Acquired Capability for Suicide Scale (ACSS; Van Orden, Witte, Gordon, et al., 2008), a self-report measure of fearlessness of death and pain tolerance.

In developing the ACSS, Van Orden, Witte, Gordon, et al. (2008) assessed for construct validity among samples of adult outpatients and noted not only a relationship

with prior suicide attempts, but with tolerance for painful and provocative experiences as well. In addition, their results indicated that the presence of both acquired capability for suicide and perceived burdensomeness, an interaction predicted by the interpersonal-psychological theory of suicide (Joiner, 2005), significantly predicted clinician-rated suicide risk ( $sr = .16, p = .026$ ). Smith et al. (2010) examined group differences among individuals who attempted suicide ( $n = 15$ ), individuals who were experiencing suicidal ideation ( $n = 15$ ), and a control group ( $n = 14$ ), and found that scores on the ACSS differed significantly among individuals experiencing ideation and individuals with a history of suicide attempts ( $\eta^2_{\text{partial}} = .160, p = .047$ ).

Much of the research related to the development of acquired capability for suicide has focused on military personnel, perhaps in part because experiences common in war are hypothesized to lead to the development of acquired capability for suicide (Joiner, 2005). Bryan et al. (2010) tested this hypothesis among a sample that consisted of both active duty military personnel and non-military adult outpatients. Their results indicated that military personnel had significantly higher levels of acquired capability for suicide than did their non-military counterparts. Additional research focused on military personnel has noted that both frequency of combat exposure (Bryan, Cukrowicz, West, & Morrow, 2010; Bryan, Hernandez, et al., 2013) and level of violence within combat exposure (Bryan & Cukrowicz, 2011) are positively correlated with increases in acquired capability for suicide. Research has also shown a significant correlation between acquired capability for suicide and suicide risk as measured by self-report among military samples ( $r = .42, p < .01$ ) that was strengthened by an interaction between acquired capability for suicide and perceived burdensomeness (Bryan, Clemans, & Hernandez, 2012).



It is unfortunate that no prospective studies related to the acquired capability for suicide or other constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) have been conducted. However, the available evidence lends credence to a link between acquired capability for suicide and suicide risk. Further, results from research evincing the impact of the interaction between perceived burdensomeness and acquired capability for suicide on suicide risk provides additional evidence in support of the validity of the interpersonal-psychological theory of suicide (Joiner, 2005) as a whole. The link between aspects of attachment style and suicide risk was explored next.

### **Attachment Anxiety and Suicide Risk**

As noted by Mikulincer and Shaver (2007), there is a relative dearth of research examining suicidal behavior from an attachment-based perspective in general. Even less literature assessing the link between suicide-related behavior and attachment anxiety, which can be defined as fear of interpersonal abandonment by those with whom one has a close relationship (Brennan et al., 1998), in particular is available. In spite of this, the available research has shown a relationships between attachment anxiety and suicide risk among both adolescent and adult populations.

Lessard and Moretti (1998) examined the relationship between attachment anxiety and suicidal ideation among a sample of 116 adolescents from a government-run mental health facility in Canada. Their results indicated that adolescents who were experiencing suicidal ideation were much more likely than their peers who were not experiencing suicidal ideation to exhibit fearful or preoccupied attachment styles, both which are thought of as being high in attachment anxiety per Brennan et al.'s (1998) conceptualization of attachment styles as being related to the two orthogonal axes of

attachment avoidance and attachment anxiety. In another study, Wright et al. (2005) assessed for a relationship between attachment style and suicide risk among a sample of 35 adolescents. Within their study, participants from a clinical population were assigned to either high or low suicide risk groups while individuals from a non-clinical sample served as a control group. Their results indicated that adolescents in the high suicide risk group were more likely than their peers to be classified as having a preoccupied or an enmeshed attachment style and less likely than their peers to have a secure attachment style.

A similar relationship has been found among adults in studies that examined the link between attachment anxiety and suicide risk. Gormley and McNeil (2009) assessed suicide risk and attachment style among a group of 109 inpatient adults. Their results indicated that individuals who had a history of both self-injury and past suicide attempts exhibited significantly higher levels of attachment anxiety than did their peers. While the variance in group membership explained by degree of attachment anxiety was relatively small ( $R^2 = .05$ ), the authors noted that “participants with levels of attachment anxiety one standard deviation above the mean were three times more likely to report past suicide attempts than those with levels of attachment anxiety one standard deviation below the mean” (Gormley & McNeil, 2009, p. 275). This is consistent with results from a study by Lizardi et al. (2011) in which adults with higher levels of attachment anxiety were found to be more likely than their peers to have a history of past suicide attempt (OR = 1.33,  $p = .019$ ).

Evidence also suggests that any link between attachment anxiety and suicidal behaviors including self-harm and suicide attempts is at least partially mediated by

interpersonal problems and characteristics. Stepp et al. (2008) examined this potential mediating effect in a mixed sample of 406 adults from both clinical and community settings. Their results indicated that attachment anxiety was directly related to past suicide attempts, past self-harm, and a combination of the two, and that the relationship between attachment anxiety and these suicide-related behaviors was also partially mediated by interpersonal sensitivity, aggression, and a lack of sociability. While evidenced in only this single study, the mediating effect of these interpersonal factors is important in that it suggests that the interpersonally-laden constructs of thwarted belongingness and perceived burdensomeness may also play a mediating role in the relationship between attachment anxiety and suicide risk.

Further evidence of a relationship between attachment anxiety and suicide risk comes from an examination of various psychological disorders linked to both increased risk for suicide and increased levels of attachment anxiety. For instance, Brennan and Shaver (1998) found that attachment styles high in attachment anxiety were strongly related to the presence of dependent personality disorder, while additional research has found that those with a diagnosis of dependent personality disorder are more likely to have experienced a prior suicide attempt than their peers (Bolton, Belik, Enns, Cox, & Sareen, 2008; Foster, Gillespie, McClelland, & Patterson, 1999). Similarly, a diagnosis of borderline personality disorder has been linked with high levels of attachment anxiety and related traits (Brennan & Shaver, 1998; Sack, Sperling, Fagen, & Foelsch, 1996) as well as increased risk for suicide, with reported lifetime suicide prevalence rates of approximately 8-10% (Workgroup on Borderline Personality Disorder, 2001) compared

to a period prevalence rate of 12.7 deaths per 100,000 individuals in the United States in the year 2011 (McIntosh & Drapeau, 2014).

Overall, past research suggests the presence of a link between attachment anxiety and suicide risk that may be mediated by interpersonal difficulties. This evidence is further strengthened by the indirect link between attachment anxiety, various psychological disorders that have a large interpersonal component, and increased suicide risk associated with those psychological disorders. The relationship between attachment avoidance and suicidal behavior, however, is less clear.

### **Attachment Avoidance and Suicide Risk**

Attachment avoidance has been defined as “discomfort with closeness [to others] and dependency [on others]” (Brennan et al., 1998, p. 48). While Mikulincer and Shaver's (2007) discussing a relative lack of research examining suicidal behavior from an attachment-based perspective was notable with regards to the relationship between attachment anxiety and suicide risk, this lack is even more pronounced when examining the link between attachment avoidance and suicide risk. Further, and in contrast to the link between attachment anxiety and suicidality, research related to attachment avoidance has at times been conflicting.

In a study by Lessard and Moretti (1998) also discussed above, the researchers examined the link between suicidal ideation and attachment style among a sample of 116 adolescents in a clinical setting. In addition to findings related to attachment anxiety, their results indicated that a dismissing attachment style, consistent with high levels of attachment avoidance and low levels of attachment anxiety in the context of Brennan et al.'s (1998) description of attachment styles, was associated with a lack of suicidal

ideation. This is largely consistent with findings from Adam et al. (1996) who examined the relationship between attachment style and suicidal behavior including past attempts and past ideation among a sample of 133 inpatient adolescents. Their results indicated that adolescent males with no history of suicidal behavior were more likely than their peers to have a dismissing attachment style. This relationship was not, however, present among female adolescents who tended to have a more even spread in attachment characteristics within the group with no history of suicidal behavior.

The results related to attachment in adulthood are perhaps even less clear and at times contradict the results for adolescents discussed above. For instance, Grunebaum et al.'s (2010) examination of the relationship between attachment styles and suicide attempts among a sample of 35 depressed adults found that attachment avoidance and not attachment anxiety predicted suicide attempts at one year follow-up. These results run contrary to the majority of findings in the field. While it is difficult to directly determine the reason for this discrepancy, the authors indicate that it may be related to the choice of scale that they used to measure attachment in their study (Grunebaum et al., 2010), suggesting that the measure used may not have accurately assessed the attachment constructs in question. Further, the choice to focus exclusively on participants who met diagnostic criteria for a major depressive episode may have impacted the results in that depression could potentially mediate the relationship between attachment avoidance and suicide risk.

In addition to these contradictory results, other researchers have found a lack of a relationship between attachment avoidance and history of suicide attempts (Gormley & McNiel, 2009; Lizardi et al., 2011) or attachment avoidance and history of self-injury

(Gormley & McNiel, 2009). The inconsistency of these results has yet to be explained, though it is possible that it is related to sample characteristics (e.g., age, gender, or comorbid diagnoses). Further, Stepp et al.'s (2008) examination of the potential mediating effects of interpersonal problems found no significant direct link between attachment avoidance and a history of suicidal behavior while significant pathways that were mediated by interpersonal problems were all found to be in the negative direction. This, in conjunction with previously discussed research, may suggest that attachment avoidance is in some ways protective with regards to risk for suicide-related behaviors.

This potential protective role could be theoretically consistent with the interpersonal-psychological theory of suicide (Joiner, 2005). Within the interpersonal-psychological theory of suicide (Joiner, 2005), the role of interpersonal perceptions of burdensomeness and lack of belonging is emphasized with regards to the development of the desire to die by suicide. Because attachment avoidance is related to a discomfort with being close to others (Brennan et al., 1998), it is reasonable to assume that the interpersonal impact of a lack of belonging may be less pronounced among individuals high in attachment avoidance. That is, individuals high in attachment avoidance may be less likely than individuals who are securely attached or who are high in attachment anxiety to experience a felt lack of belongingness or, if felt, to react negatively to such feelings. In the absence of feelings of thwarted belongingness, the interpersonal theory predicts that risk of suicidal ideation would be diminished (Van Orden et al., 2010). As a result, it is theoretically possible that any positive influence that attachment avoidance has on suicide risk occurs via a positive relationship between attachment avoidance and acquired capability for suicide, while any potential protective role attachment avoidance

may play with regards to suicide risk is the result of a negative relationship between attachment avoidance and the interpersonally-focused constructs of thwarted belongingness and perceived burdensomeness.

### **Insecure Attachment and Suicide Risk**

In addition to evidence above indicating that attachment anxiety, and potentially attachment avoidance, has an impact on suicide risk, there is further evidence that insecure attachment in general, which can be defined as high levels of attachment anxiety, attachment avoidance, or both (Brennan et al., 1998), is related to increased risk for suicide. For instance, in Adam et al.'s (1996) investigation of the relationship between attachment style and history of suicidal behaviors, the researchers noted that participants who had such a history were more likely to be classified as having an unresolved-disorganized style (62%) than were their peers (34%), and that the difference between groups was significant,  $\chi^2(1, N = 33) = 10.38, p = .001$ . This style of attachment can be conceptualized as high in both attachment anxiety and attachment avoidance. These results were consistent with findings from Violato and Arato (2004) who utilized discriminant analysis in an effort to identify factors that would be useful in predicting history of suicide among a sample of 52 adolescents from clinical and community populations. The authors concluded, "Compared to the nonsuicidal group then, more of the suicidal group had insecure maternal, parental and paternal attachment" (p. 166).

In examining the relationship between attachment style and history of suicide attempts among a sample of 126 undergraduate students, de Jong (1992) also obtained significant results. Findings indicated that individuals with a history of past suicide attempts had lower levels of attachment security in relationships with both their mothers

and their fathers than did their peers with no history of such attempts. While further published research linking adult attachment style and suicide risk was not found, these results suggest the possibility that some combination of attachment anxiety and attachment avoidance may also be related to increased risk for suicide.

In addition to the positive findings noted above, several researchers have found contradictory results. In a more recent study examining the relationship between attachment style and suicide-related thoughts and behaviors among an inpatient sample of 194 adolescents, researchers found no discernible relationship (Venta & Sharp, 2014). However, the measure of attachment utilized in this study, the Child Attachment Interview, has been shown to be a valid measure only among children aged 8-12 years (Shmueli-Goetz, Target, Fonagy, & Datta, 2008) while the sample utilized in their study was older ( $M_{age} = 16.0$ ,  $SD = 1.4$ ). Venta and Sharp (2014) acknowledge this discrepancy while arguing that the Child Attachment Interview has, in fact, been utilized with adolescent samples in the past. However, the research cited for such use (Humfress, O'Connor, Slaughter, Target, & Fonagy, 2002; Scott, Briskman, Woolgar, Humayun, & O'Connor, 2011) also utilized younger samples with mean ages of 12.7 and 12.6 years respectively. While by no means completely negating their findings, this does raise questions related to the validity of their results.

Another study among a sample of 48 Vietnam combat veterans with a diagnosis of PTSD found an inverse relationship between attachment and suicidal ideation (Nye et al., 2009). Results in this study indicated that individuals who were rated as securely attached had higher degrees of suicidal ideation and those rated as insecurely attached had lower degrees of suicidal ideation. While only a single study, these results suggest



that other factors, such as a diagnosis of PTSD, may mediate the relationship between attachment security and suicide-related behaviors.

### **Summary**

The preceding examination resulted from the integration and synthesis of research obtained as the result of a comprehensive review of relevant literature related to the interpersonal-psychological theory of suicide, attachment theory, and suicide risk. The interpersonal-psychological theory of suicide (Joiner, 2005) is a relatively new and promising theory of suicidal behavior that attempts to answer two separate but related questions: “Who desires death by suicide?” and “Who is capable of dying by suicide?” It is the attempt to answer the second of these questions that makes the interpersonal-psychological theory of suicide (Joiner, 2005) such a unique and potentially important contribution to the field of suicidology (Klonsky & May, 2013). This theory posits a total of three constructs hypothesized to explain differences in suicide risk: perceived burdensomeness, thwarted belongingness, and the acquired capability for suicide (Van Orden et al., 2010). Within these three constructs, perceived burdensomeness and thwarted belongingness have been put forth as being related mainly to increases in suicidal ideation while acquired capability for suicide has been hypothesized as a factor unrelated to suicidal ideation through which an individual moves from thoughts of suicide to suicidal action.

Both the interpersonal-psychological theory of suicide (Joiner, 2005) and Bowlby’s (1969) attachment theory provide means of conceptualizing and understanding the importance of interpersonal perceptions. Brennan et al.’s (1998) conceptualization of attachment along two orthogonal axes of anxiety and avoidance provides a concrete and

measurable way of identifying attachment styles. While literature supporting a direct link between the more ideation-related constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) and the orthogonal dimensions of attachment theory (Brennan et al., 1998) is currently lacking, available research has indirectly supported a link through related constructs such as low self-esteem (Arbona & Power, 2003; Lee & Hankin, 2009; Roberts et al., 1996), shame (Wei et al., 2005), self-perceived burdensomeness (Kowal et al., 2012), and loneliness (Berlin et al., 1995; Feeney, 2006; Pereira et al., 2013).

There is evidence of a relationship between attachment anxiety and suicidal ideation (Lessard & Moretti, 1998) as well as the closely related (Beck et al., 1997; Brown et al., 2000; Way et al., 2005) construct of suicide risk (Gormley & McNiel, 2009; Wright et al., 2005). The relationship between attachment avoidance and suicide risk is more tentative at this time. Some research suggests that attachment avoidance is negatively related to suicide risk (Adam et al., 1996; Lessard & Moretti, 1998). Other research has suggested a positive relationship while acknowledging inherent limitations in study design (Grunebaum et al., 2010). Still other research has failed to find any significant relationship at all between these constructs (Gormley & McNiel, 2009; Lizardi et al., 2011). Further, there is preliminary evidence suggesting that any relationship between the orthogonal components of attachment and the constructs of suicidal ideation and suicide risk may be moderated by interpersonal factors (Stepp et al., 2008). It is therefore possible that any conflicting findings are the result of attachment avoidance impacting different aspects of the interpersonal-psychological theory of suicide (Joiner, 2005) in different ways (i.e., having a negative effect on perceived burdensomeness and thwarted belongingness and a positive effect on acquired capability for suicide).

The constructs of perceived burdensomeness (Jahn & Cukrowicz, 2011; Overholser et al., 1995; Van Orden et al., 2006, 2012; Wong et al., 2014) and thwarted belongingness (Bryan, Hernandez, et al., 2013; Hawkins et al., 2014; Stravynski & Boyer, 2001; Van Orden et al., 2012) have themselves been linked both directly and indirectly to suicide risk. In addition, there is evidence both that the acquired capability for suicide is impacted by exposure to fearful or painful stimuli such as past suicide attempts (Van Orden, Witte, Gordon, et al., 2008) and exposure to violence in military combat (Bryan, Cukrowicz et al., 2010; Bryan, Hernandez et al., 2013) and that the acquired capability for suicide is related to suicide risk (Smith et al., 2010). Lastly, there is preliminary evidence supporting the hypothesis that a combination of the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) is itself also related to increased risk for suicide (Bryan et al., 2012).

Taken together, the interpersonal-psychological theory of suicide (Joiner, 2005) and attachment theory (Bowlby, 1969) provide a powerful framework for conceptualizing suicide-related behaviors. Unfortunately, there is currently a lack of research examining attachment-related constructs and the constructs of the interpersonal-psychological theory of suicide in tandem. As a result, any relationships between these constructs remain hypothetical at this time. The present study aims to fill this gap in the literature by providing the first direct examination of attachment and suicide risk in the context of the interpersonal-psychological theory of suicide while simultaneously expanding on and working to clarify the at times conflicting literature related to attachment insecurity and suicide risk.

### **Limitations of Literature Review**

A number of limitations may have impacted the comprehensiveness of the current literature review. First, this review was limited to two educational databases: PsycINFO and ERIC. As a result, it is possible that articles and other literature indexed exclusively by alternative databases may have been overlooked. Second, the present review may have been negatively impacted by the file drawer problem in which research with statistically insignificant results may not be published (Dalton & Aguinis, 2012), potentially leading to an overestimation of the relationship between constructs of interest. Third, the restriction of this literature review to only English-language sources may have inadvertently limited its extensiveness and excluded relevant research that was not initially written in or has not been translated into English. Lastly, it is possible that researcher error has resulted in the inadvertent exclusion of relevant literature from the present review, though every attempt has been made to avoid such an error. Overall, this literature review is believed to provide a thorough discussion and exposition of literature relevant to the research questions enumerated in Chapter I of this work.

### **Implications and Future Directions**

Mikulincer and Shaver (2007) lamented the relative dearth of research examining suicide from an attachment-based perspective and while new research has surfaced since the time of their writing, studies of the relationship between attachment and suicide remain sparse. Perhaps in part because of the relative newness of the interpersonal-psychological theory of suicide (Joiner, 2005), much more research is needed to solidify the links between its constructs and suicide risk in general. The relative lack of such research is further exacerbated by the low base rate of suicidal behavior, excluding

suicidal ideation, in both clinical samples and the general population. More research, especially research of a longitudinal nature, is therefore necessary to provide a comprehensive means of understanding not only the relationship between the constructs being studied here, but the utility of the interpersonal-psychological theory of suicide (Joiner, 2005) as a whole.

## CHAPTER III

### METHODS

This study utilized a non-experimental cross-sectional design in order to examine the relationships between the attachment-related constructs of anxiety and avoidance, the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005), and suicide risk. The goal was to provide important new information related to the relationship between attachment and suicide risk while simultaneously identifying a possible pathway through which the relationship between attachment style and suicide risk can be explained. A sample of undergraduate college students, most of whom were freshmen enrolled in either a freshman seminar course or in an introductory psychology course, were recruited. These students completed a series of self-report measures described below utilizing online survey software (i.e., Qualtrics, 2014). Because of the potential for threats to validity inherent in the use of online survey methods (Johnson, 2005), steps were taken to identify and prevent the inclusion of invalid responses.

In this study, scales related to attachment, the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005), and suicide-related thoughts and behaviors were utilized to operationalize the constructs of interest. Research supports the conceptualization of attachment constructs (Fraley & Waller, 1998), constructs of the interpersonal-psychological theory of suicide (Van Orden et al., 2010), and suicide risk (Gutierrez & Osman, 2008) as latent factors. Specifically, attachment was operationalized

as being related to the two orthogonal factors of attachment anxiety and attachment avoidance (Brennan et al., 1998); concepts within the interpersonal-psychological theory of suicide were operationalized in the context of the three constructs of perceived burdensomeness, thwarted belongingness, and acquired capability for suicide (Van Orden et al., 2010); and suicide risk was operationalized as a combination of suicide-related thoughts and behaviors, past suicide attempts, and experiences related to non-suicidal self-injury (Muehlenkamp, Cowles, & Gutierrez, 2009).

Once data were collected, a structural equation modeling (SEM) procedure was utilized in order to analyze relationships among the chosen latent factors. In accordance with the results of my literature review, primary explanatory model (see Figure 3) was proposed that posited indirect effects of attachment anxiety and attachment avoidance on suicide risk fully mediated by the constructs of the interpersonal-psychological theory of suicide. More specifically, this model suggested that both attachment anxiety and attachment avoidance would be indirectly related to suicide risk via a relationship with all three constructs of the interpersonal-psychological theory of suicide. An alternative model (see Figure 4) in which attachment anxiety and attachment avoidance were, in addition to their indirect relationships, directly related to suicide risk was also proposed.

SEM provides a means for assessing interrelationships between latent factors. These latent factors can be thought of as representing unobservable hypothetical constructs that, due to their nature, cannot be directly measured (Kline, 2011). SEM allows for these latent factors to be measured by proxy through the use of observable variables that serve as indicators within the SEM analytic process (Kline, 2011). For the present study, the self-report measures that participants were asked to complete served as

these observable indicator variables. Because any indicator variable will necessarily be an imperfect measure of the underlying latent factor being assessed, SEM allows for error in measurement to be taken into account in assessing interfactor relationships (Kline, 2011).

In discussing the development of SEM models, Kline (2011) notes that it is more common for initial models to provide a relatively poor fit for the data than a relatively good fit, thereby requiring respecification of the proposed structural model. Due to the inherent likelihood of initial poor fit, utilizing a strictly confirmatory or alternative model testing procedure (Jöreskog, 1993) seems ill advised. As such, Jöreskog's (1993) model generating approach to SEM was utilized. In this approach models are tentatively proposed prior to data collection and analysis with the understanding that models may need to be modified and retested in pursuit of a model that not only fits the data well, but is also outwardly interpretable and consistent with theory. In short, then, this study utilized a cross-sectional, non-experimental research design using a sample of undergraduate college students in which a model generating SEM analysis procedure was employed to identify and subsequently interpret a model of interrelationships between the latent factors of attachment anxiety, attachment avoidance, perceived burdensomeness, thwarted belongingness, acquired capability for suicide, and suicide risk.

### **Participants**

Participants for the present study consisted of undergraduate students from a medium-sized, Rocky Mountain region university. All data were collected using online survey software from Qualtrics (Qualtrics, 2014). A total of 495 participants began and completed at least some portion of the survey items for the present study. Of these 495 participants, 60 individuals fully omitted at least one of the measures. As such, data for



these 60 individuals were removed from this analysis. The remaining sample of 435 participants was well above the recommended minimum of 200 participants necessary to obtain useful results in SEM analysis (Barrett, 2007; Kline, 2011; Weston & Gore, 2006). Of these 435 remaining participants, 71.7% were recruited from the freshman seminar course, 14.9% were recruited from the undergraduate psychology pool, and 13.4% were recruited directly via email.

All remaining participants were between the ages of 18 and 23 ( $M = 18.73$ ,  $SD = 1.068$ ). In addition, 70.1% identified as female, 29.4% of participants identified as male, and 0.5% chose not to provide an identified gender. With regards to the ethnic composition of participants, 60.0% identified as Caucasian, 17.2% identified as Hispanic, 11.7% identified as multi-ethnic, 7.8% identified as African American, 2.1% identified as other, and 1.2% identified as Asian or Asian American. These demographics were roughly in line with those of the university that this study's sample was recruited from where 65% of students identify as female and ethnic composition includes 61% Caucasian, 14% Hispanic, and 2% Asian American. Of note, African American students and those identifying as multi-ethnic were overrepresented in this study and are each estimated to makeup approximately 3% of the overall university student population (University of Northern Colorado, 2014).

## **Instrumentation**

### **Attachment**

The latent variables of attachment anxiety and attachment avoidance were measured using the Experiences in Close Relationships-Revised (ECR-R; Fraley, Waller, & Brennan, 2000). The ECR-R, a self-report measure of adult romantic attachment, is a

revised version of the Experiences in Close Relationships (ECR) originally developed by Brennan et al. (1998). In developing the ECR-R, Fraley et al. (2000) utilized an item-response theory approach to refine the ECR and improve its psychometric qualities. The resultant ECR-R scale consists of 36 items divided into two subscales: an 18-item attachment anxiety subscale and an 18-item attachment avoidance subscale. On the ECR-R, respondents were asked to rate their level of agreement with various statements on a 7-point Likert-type scale with responses ranging from 1 (“*Strongly disagree*”) to 7 (“*Strongly agree*”).

**Attachment anxiety.** Within Brennan et al.'s (1998) orthogonal model of attachment, attachment anxiety has been defined as a fear of interpersonal abandonment by those with whom one has a close relationship. Items on the attachment anxiety subscale of the ECR-R are focused on experiences of fear, worry, and uncertainty in relationships with others and include statements such as “I’m afraid that I will lose my partner’s love,” and “My romantic partner makes me doubt myself.” Several items are presented in terms of a lack of worry related to attachment relationships such as “I rarely worry about my partner leaving me,” and “I do not often worry about being abandoned,” and must be reverse-coded prior to scoring. Higher scores on this subscale indicate higher levels of attachment anxiety as operationalized in this study.

The attachment anxiety subscale of the ECR-R has been found to have excellent internal consistency reliability of scores among various samples including undergraduate college students ( $\alpha = .92$  to  $.94$ ; Fairchild & Finney, 2006; Sibley, Fischer, & Liu, 2005), adults ( $\alpha = .95$ ; Goldenson & Geffner, 2007), and a mixed community sample ( $\alpha = .93$ ; Follingstad, 2011). Internal consistency reliability for the present study was also excellent

( $\alpha = .94$ ). The anxiety subscale of the ECR-R has been found to display adequate convergent and divergent validity among undergraduate samples. In one study, researchers found a relationship between ECR-R anxiety subscale scores and diary ratings of daily experiences of anxiety in interactions with romantic partners (Sibley et al., 2005). In another study, scores on the attachment anxiety subscale of the ECR-R were found to correlate positively with scores on self-report measures of loneliness ( $r = .528$ ) and worry ( $r = .386$ ) and negatively with scores on a self-report measure of perceived social support ( $r = -.431$ ; Fairchild & Finney, 2006). Taken together, this suggests that the use of the ECR-R anxiety subscale as a measure of attachment anxiety with this study's population is valid. For the purposes of analysis, items from the ECR-R attachment anxiety subscale were parceled in the manner described in the Data Analysis section below in order to ensure that three indicators were available for measuring the latent construct of attachment anxiety.

**Attachment avoidance.** Attachment avoidance has been defined within the orthogonal model of attachment as feelings of discomfort with reliance on or closeness to others (Brennan et al., 1998). Items on the avoidance subscale of the ECR-R are related to feelings of comfort, or lack thereof, with emotional proximity to a partner and include statements such as "I prefer not to show a partner how I feel deep down," and "I am nervous when partners get too close to me." As with the anxiety subscale, there are also a number of items that assess for positive experiences of comfort and must, therefore, be reverse-coded prior to scoring. This includes items such as "I am very comfortable being close to romantic partners," and "I tell my partner just about everything." Higher scores

on this subscale indicate higher levels of attachment avoidance as operationalized in this study.

The attachment avoidance subscale of the ECR-R has been found to have good to excellent internal consistency reliability of scores across various samples including undergraduate college students ( $\alpha = .91$  to  $.94$ ; Fairchild & Finney, 2006; Sibley et al., 2005), adults ( $\alpha = .89$ ; Goldenson & Geffner, 2007), and a mixed community sample ( $\alpha = .94$ ; Follingstad, 2011). Internal consistency reliability for the present study was excellent ( $\alpha = .94$ ). Sibley et al. (2005) noted that the avoidance subscale of the ECR-R had adequate convergent and divergent validity among an undergraduate sample when assessed in relation to diary ratings of avoidance in interactions with romantic partners. Further, researchers have found that scores on the avoidance subscale of the ECR-R correlate negatively with self-report measures of affectionate proximity with a partner ( $r = -.512$ ) and perceived social support ( $r = -.454$ ) and correlate positively with self-report measures of touch avoidance ( $r = .511$ ) and loneliness ( $r = .368$ ; Fairchild & Finney, 2006). Taken together, this suggests that the use of the avoidance subscale of the ECR-R with this study's population is valid. For the purposes of analysis, items from the ECR-R attachment avoidance subscale were parceled in the manner described in the Data Analysis section below in order to ensure that three indicators were available for measuring the latent construct of attachment avoidance.

### **Perceived Burdensomeness**

Perceived burdensomeness can be defined as a view of the self as so inherently flawed as to be a liability to or burden on the important others in one's life (Van Orden et al., 2010). In order to assess for feelings of perceived burdensomeness, Van Orden,

Witte, Gordon, et al. (2008) developed the Interpersonal Needs Questionnaire (INQ). Initially a 12-item measure, the INQ underwent several revisions before a final 15-item self-report version was created and validated utilizing factor analysis techniques (Van Orden et al., 2012). The INQ consists of two subscales: a six-item perceived burdensomeness subscale and a nine-item thwarted belongingness subscale. The perceived burdensomeness subscale of the INQ was used in the present study as an operationalized measure of the perceived burdensomeness construct of the interpersonal-psychological theory of suicide (Joiner, 2005). Respondents were asked to rate their level of agreement with various statements on a 7-point Likert-type scale with responses ranging from 1 (“*Not at all true for me*”) to 7 (“*Very true for me*”). Items on the perceived burdensomeness subscale of the INQ consist of statements related to feelings of burdensomeness including “These days the people in my life would be better off if I were gone,” and “These days I think I make things worse for the people in my life.” Higher scores on this subscale indicate higher levels of perceived burdensomeness as operationalized in this study.

In spite of the relative newness of the 15-item version of the INQ, numerous researchers have used this measure and found the perceived burdensomeness subscale to have excellent internal consistency reliability of scores among various samples including outpatient adults ( $\alpha = .91$ ; Hawkins et al., 2014), adult US Air Force personnel ( $\alpha = .92$ ; Bryan, Ray-Sannerud, et al., 2013) and undergraduate students from the same university from which this study’s sample was drawn ( $\alpha = .95$ ; Kacmarski et al., 2014). Internal consistency reliability for the present study was also excellent ( $\alpha = .95$ ). Researchers have demonstrated adequate convergent and divergent validity for the perceived

burdensomeness subscale of the INQ across various groups. For example, Van Orden et al. (2012) developed a regression model in which scores on the perceived burdensomeness subscale of the INQ served as the dependent variable and found significant relationships with self-report measures of self-liking ( $\beta = -.249$ ), autonomy ( $\beta = -.176$ ), responsibility to family ( $\beta = -.153$ ), and self-competence ( $\beta = -.261$ ) among a sample of younger adults, thereby providing evidence of convergent validity. Evidence for divergent validity was provided by the lack of significant relationships between items on the INQ perceived burdensomeness subscale and constructs believed to be more closely related to thwarted belongingness including self-report measures related to feelings of loneliness, social support, and relatedness to others. Taken together, this suggests that the use of the INQ perceived burdensomeness subscale with this study's sample is valid. For the purposes of analysis, items from the INQ perceived burdensomeness subscale were parceled in the manner described in the Data Analysis section below in order to ensure that three indicators were available for measuring the latent construct of perceived burdensomeness.

### **Thwarted Belongingness**

Thwarted belongingness can be defined as a felt sense of lack of social belongingness, especially as it pertains to important others in one's life, that is marked by feelings of loneliness and a lack of reciprocal caring (Van Orden et al., 2010). The nine-item thwarted belongingness subscale of the INQ, described in more detail above, was used in the present study as an operationalized measure of the thwarted belongingness construct of the interpersonal-psychological theory of suicide (Joiner, 2005). Respondents were asked to rate their level of agreement with various statements on a 7-

point Likert-type scale with responses ranging from 1 (“*Not at all true for me*”) to 7 (“*Very true for me*”). Items on the thwarted belongingness subscale of the INQ consist of statements related to feelings of loneliness and lack of belonging including “These days I rarely interact with people who care about me,” and “These days I feel disconnected from other people.” In addition, a number of items assess for felt belongingness and therefore must be reverse-coded prior to scoring. Examples of such items include “These days other people care about me,” and “These days I am close to other people.” Higher scores on this subscale indicate higher levels of thwarted belongingness as operationalized in this study.

Researchers have found the thwarted belongingness subscale of the INQ to have good to excellent internal consistency reliability of scores among various samples including outpatient adults ( $\alpha = .90$ ; Hawkins et al., 2014) and undergraduate students from the same university from which this study’s sample was drawn ( $\alpha = .89$ ; Kacmarski et al., 2014). Internal consistency reliability for the present study was good ( $\alpha = .87$ ). Van Orden et al. (2012) assessed convergent validity for the thwarted belongingness subscale of the INQ among a sample of young adults by creating a regression model in which scores on this subscale served as the dependent variable. Their findings indicated significant relationships with self-report measures of loneliness ( $\beta = .914$ ), social support ( $\beta = -.756$ ), and relatedness to others ( $\beta = -.842$ ). Taken together, the above evidence suggests that the use of the INQ thwarted belongingness subscale with this study’s sample is valid. For the purposes of analysis, items from the INQ thwarted belongingness subscale were parceled in the manner described in the Data Analysis section below in

order to ensure that three indicators were available for measuring the latent construct of thwarted belongingness.

### **Acquired Capability for Suicide**

The acquired capability for suicide can be defined as the ability to overcome the fear and expectation of pain related to engaging in a suicidal act (Van Orden et al., 2010). In order to assess degrees of acquired capability for suicide, Van Orden, Witte, Gordon et al. (2008) developed the Acquired Capability for Suicide Scale (ACSS) as a 20-item self-report measure of the acquired capability for suicide. Respondents were asked to rate how well each statement describes them on a 5-point Likert-type scale with responses ranging from 0 (“*Not at all like me*”) to 4 (“*Very much like me*”). Items on the ACSS consist of statements related to general experiences of fear and responses to pain including “Things that scare most people do not scare me,” and “I could kill myself if I wanted to.” There are also a number of items that, due to their wording, must be reverse-coded prior to scoring. Examples of these items include “The sight of blood bothers me a great deal,” and “The pain involved in dying frightens me.” Higher scores on the ACSS indicate higher levels of acquired capability for suicide as operationalized in this study.

The ACSS has been found to have good internal consistency reliability of scores among various samples including adults ( $\alpha = .88$ ; Smith et al., 2010) and undergraduate college students ( $\alpha = .83$  to  $.84$ ; Anestis, Bagge, Tull, & Joiner, 2011; Rasmussen & Wingate, 2011). Internal consistency reliability for the present study was also good ( $\alpha = .80$ ). Scores on the ACSS have been found to accurately differentiate individuals who are experiencing suicidal ideation from those who have a history of suicide attempt among a sample of inpatient and community adults (Smith et al., 2010). Total scores on the ACSS



have also been found to have significant correlations with a self-report measure of painful experiences ( $r = .29$ ) and past suicide attempts ( $r = .17$ ; Van Orden, Witte, Gordon, et al., 2008) among a sample of outpatient adults. Further, total scores on the ACSS have been shown to correlate positively with self-reported experiences of painful and provocative events ( $r = .42$ ) and pain tolerance as measured experimentally ( $r = .34$ ), but to have no significant correlation with self-reported levels of depression ( $r = .08$ ) or suicidal ideation ( $r = .04$ ) among a sample of undergraduate students (Anestis et al., 2011), thereby providing evidence for both convergent and divergent validity. In combination with the reliability data presented above, this suggests that the use of the ACSS with this study's proposed sample is valid. For the purposes of this analysis, items from the ACSS were parceled in the manner described in the Data Analysis section below in order to ensure that three indicators were available for measuring the latent construct of acquired capability for suicide.

### **Suicide Risk**

Suicide risk is a multifaceted construct that is difficult to measure accurately (Goldney, 2000) due at least in part to the relatively low base rate of death by suicide in the United States where overall rates for 2011, the most recent year for which data is available, were 12.7 per 100,000 individuals (McIntosh & Drapeau, 2014). In addition, suicide risk assessment may take several forms including the use of self-report measures (Gutierrez, Osman, Barrios, & Kopper, 2001) as in this study and the use of face-to-face interviews as is common in clinical settings (Jobes, 2006). As a result of the complex nature of suicide risk as a construct, it is important that numerous factors be taken into account when assessing suicide risk. While many factors will be assessed by the

measures described below, as noted in Chapter I of this document, there are limitations to the use of self-report measures in this context and any thorough suicide risk assessment in a clinical setting should involve the assessment of additional factors (Bryan & Rudd, 2006). Jacobs, Brewer, and Klein-Benheim (1999) recommend that any assessment of suicide risk “should include questions about suicidal thoughts, plans, and behavior” (p. 20). As such, suicide risk was assessed using three separate self-report measures in order to ensure adequate coverage of the three aspects of suicide risk noted above. Of these three measures, one was utilized specifically to assess for suicidal ideation while the other two contained items covering a range of suicide-related behaviors including prior attempts, thoughts, and plans.

**Adult Suicidal Ideation Questionnaire.** The Adult Suicidal Ideation Questionnaire (ASIQ; Reynolds, 1991) is a 25-item self-report measure of suicidal ideation. Respondents were asked to indicate the frequency with which they have certain thoughts related to suicide using a 7-point Likert-type scale that ranges from 0 (“*I never had this thought*”) to 6 (“*Almost every day*”). Items on the ASIQ consist of statements related to suicidal thinking, each of which builds off of the stem, “This thought was in my mind...” Examples of items include “I wished I were dead,” and “I wished I had the nerve to kill myself.” Higher scores on the ASIQ indicate higher degrees suicidal ideation and therefore higher suicide risk as operationalized in this study.

Internal consistency reliability of scores for the ASIQ have been demonstrated to be excellent among various samples including inpatient ( $\alpha = .95$ ; Horon, McManus, Schmollinger, Barr, & Jimenez, 2013) and community adults ( $\alpha = .98$ ; Walker, Salami, Carter, & Flowers, 2014) as well as undergraduate college students ( $\alpha = .97$  to  $.98$ ;

Kacmarski et al., 2014; Reynolds, 1991). Internal consistency reliability for the present study was also excellent ( $\alpha = .98$ ). Significant differences in ASIQ total scores have been found between adult suicide attempters and psychiatric inpatients,  $F(1, 203) = 159.08, p < .001, \eta^2 = .44$  (Osman et al., 1999). In addition, total scores on the ASIQ have been found to correlate significantly with self-reported levels of depression ( $r = .60$ ), hopelessness ( $r = .53$ ), self-esteem ( $r = -.48$ ), and past suicide attempts ( $r = .33$ ) among a sample of college students (Reynolds, 1991). Taken together, these findings suggest that the use of the ASIQ with this study's sample is appropriate. For the purposes of this study, total scores for the ASIQ were used as the first of three indicators for measuring the latent construct of suicide risk.

**Suicide Behaviors Questionnaire – Revised.** The Suicide Behaviors Questionnaire – Revised (SBQ-R; Osman et al., 2001) is a four item self-report measure of various dimensions of suicidality including lifetime experiences of suicidal ideation or suicide attempts, the frequency of suicidal ideation in the last year, lifetime threat of suicide attempt, and likelihood that an individual will undertake a suicide attempt in the future. Items on the SBQ-R have variable scoring criteria related to the number of possible responses for each item. For example, the item related to frequency of suicidal ideation in the past year, “How often have you thought about killing yourself in the past year?” is scored using a 5-point Likert-type scale with scores ranging from 1 (“*Never*”) to 5 (“*Very Often (5 or more times)*”) while the question related to lifetime threat of suicide attempt, “Have you ever told someone that you were going to commit suicide, or that you might do it?” is scored using a 3-point Likert-type scale with some scores corresponding to more than one possible response ranging from 1 (“*No*”) to 3 (“*Yes, more than once, but*”).

*did not want to do it*” or “*Yes, more than once, and really wanted to do it*”). A total score is obtained by summing item scores and higher scores on the SBQ-R indicate higher degrees of suicide-related behaviors.

Internal consistency reliability of scores for the SBQ-R have been shown to be good among various samples including inpatient adolescents ( $\alpha = .88$ ; Osman et al., 2001), high school students ( $\alpha = .87$ ; Osman et al., 2001), inpatient adults ( $\alpha = .87$ ; Osman et al., 2001), and undergraduate college students ( $\alpha = .71$  to  $.86$ ; Gutierrez, Osman, Barrios, & Kopper, 2001; Muehlenkamp, Gutierrez, Osman, & Barrios, 2005; Osman et al., 2001). Internal consistency reliability for the present study was also good ( $\alpha = .80$ ). Significant differences in SBQ-R total scores have been found between groups of suicidal and non-suicidal high school students ( $t(136) = 16.19, p < .001$ ), undergraduates ( $t(133) = 10.83, p < .001$ ), and adult inpatients ( $t(118) = 10.50, p < .001$ ; Osman et al., 2001). Scores on the SBQ-R have also been shown to correlate highly with other self-report measures of suicide-related behaviors ( $r = .77$ ) among undergraduate students (Gutierrez et al., 2001). Taken together, this suggests that the use of the SBQ-R with this study’s sample is appropriate. For the purposes of this study, total scores for the SBQ-R were used as the second of three indicators for measuring the latent construct of suicide risk.

**Self-Harm Behaviors Questionnaire.** The Self-Harm Behaviors Questionnaire (SHBQ; Gutierrez & Osman, 2008) is a self-report measure of suicide and self-harm related behaviors that is divided into four sections: history of non-suicidal self-injury, history of suicide attempts, threats of suicide, and suicide ideation (Gutierrez et al., 2001). Within these four sections, additional details related to past suicide-related

behaviors are collected. For example, item 2 on this measure asks, “Have you ever attempted suicide?” If a respondent indicates that they have attempted suicide, they are then asked to provide additional details including, “How?” and “How many times?” Gutierrez and Osman (2008) devised a comprehensive scoring system through which these responses can be coded and “a single numerical value is derived to represent each item in carrying out statistical analyses” (Gutierrez et al., 2001, p. 477). Total scores on the SHBQ are obtained by summing individual item scores and range from 0 to 78 with higher scores indicating greater degrees of suicide-related behaviors (Gutierrez & Osman, 2008).

Internal consistency reliability of scores for the SHBQ have been demonstrated to be excellent among diverse adolescent ( $\alpha = .93$ ; Muehlenkamp et al., 2009) and undergraduate ( $\alpha = .90$  to  $.95$ ; Muehlenkamp et al., 2005) samples. Internal consistency reliability for the present study was also excellent ( $\alpha = .92$ ). Positive correlations have been found between scores on the SHBQ and self-reported levels of depression ( $r = .58$ ), suicidal ideation ( $r = .70$ ), and suicide risk ( $r = .57$ ) among a sample of undergraduate students (Gutierrez et al., 2001), providing evidence for convergent validity. Discriminant validity was also demonstrated among this same sample with individuals experiencing higher levels of suicidal ideation obtaining higher total scores than controls ( $t(38) = 10.68, p < .001, d = 3.38$ ). Taken together, this suggests that the use of the SHBQ with this study’s population is appropriate. For the purposes of this study, total scores for the SHBQ were used as the third of three indicators for measuring the latent construct of suicide risk.

## Procedures

### Participant Recruitment

After approval from the Institutional Review Board at the University of Northern Colorado was received, recruitment of participants began. This study utilized a non-probability convenience sample of undergraduate students at the University of Northern Colorado. Because this study used a cross-sectional design and there was no variable manipulation, such a sampling procedure should be sufficient, though its use necessitated a discussion of threats to validity potentially introduced through the use of a convenience sample including selection bias and lack of generalizability (Remler & Van Ryzin, 2011). Participants were recruited primarily in one of two ways: via their enrollment in a freshman seminar course or via the undergraduate psychology subject pool. A third recruitment method involved students being contacted directly via email. Only a single exclusion criterion was utilized in allowing participation in the present study: being younger than 18 years of age.

Those students enrolled in the freshman seminar course were recruited face-to-face and provided with a printed informed consent document that included an overview of the study (see Appendix B) at the time of recruitment. Due to restrictions placed on recruitment procedures for those utilizing the undergraduate psychology pool, direct recruitment was not possible. Instead, potential participants were free to choose among numerous studies including this study to satisfy course research participation requirements. In order to recruit students via email, a list of undergraduate student email addresses was obtained from university personnel specifically for the purposes of study recruitment. These students were emailed directly (see Appendix C) and those students

who chose to click a link in the email that directed them to the online survey. Upon doing so they were immediately presented with informed consent information similar to that provided to students in the freshman seminar course (see Appendix B) prior to their agreeing to participate.

### **Informed Consent Process**

Face-to-face recruitment included a description of the study and a review of informed consent. As part of the informed consent process, potential participants were informed of the voluntary nature of their participation in this study, informed that they may discontinue participation in this study at any time if they chose to participate, and informed of the exclusion criterion related to age. Individuals recruited via the undergraduate psychology pool or via email received this same information in electronic format prior to participation. While research has consistently shown that participation in studies related to suicide does not increase risk that one will engage in a suicidal act even if an individual is experiencing suicidal ideation at the time of participation (Cukrowicz, Smith, & Poindexter, 2010; Gould et al., 2005), participants were nonetheless provided with a list of local and national mental health and suicide prevention resources that could be utilized in the event that any participants were in need of such services (see Appendix D).

### **Survey Process**

All participants were directed to complete the survey materials for this study via Qualtrics (Qualtrics, 2014) online survey software either in person where they were provided with a hard copy of the URL necessary to participate in the study, via the online participant management system software SONA that was in use at the institution from

which students were recruited, or via a link provided in the recruitment email sent to them. Through the Qualtrics (Qualtrics, 2014) software, informed consent was provided and participants were asked to indicate their informed agreement to participate in the study. Participants were again be reminded of the voluntary nature of their participation and provided with the list of local and national mental health resources (see Appendix D) at the time that they began the survey. In order to ensure anonymity in the collection of data, appropriate options were selected within the Qualtrics software to ensure that identifying information including internet protocol (IP) addresses were not recorded. The measures used in this study were adapted to accommodate Qualtrics formatting requirements. Items were presented in a matrix grid with appropriate anchors provided and participants were asked to indicate their answer to specific items by either clicking a radio button or checkbox or by typing in their desired response. The order of administration of the measures discussed above was randomized within the Qualtrics software in order to minimize any survey question order effects (Rasinski, Lee, & Krishnamurty, 2012). Upon completing the survey, participants were thanked for their participation and provided with proof of completion in the event that it was needed. They were also once again provided with contact information for local and national mental health resources (see Appendix D) and advised to contact one of these resources if they were experiencing thoughts or engaged in behaviors related to suicide.

In addition to the above, participants recruited via email were offered a sweepstakes incentive to participate in which they were allowed to submit their email address in order to win one of two \$25 Target gift cards. Such incentives have been shown to increase response and participation rates when online surveys are used (LaRose



& Tsai, 2014). Email addresses for the sweepstakes were collected via a second Qualtrics survey that participants were linked to upon completion of the main study measures. The use of a separate survey to collect email address data allowed for the maintenance of anonymity with regards to survey responses.

### **Data Analysis**

At the end of the data collection phase, individual responses were downloaded into a spreadsheet that was saved in a password-protected format. Initial statistical analyses were completed using SPSS statistical software version 23.0.0.0 (IBM Corp., 2015). All SEM analyses were conducted using Stata 14.1 (StataCorp, 2015). Analysis was carried out using a six-step process as outlined by Kline (2011) that proceeded as follows: (a) specify the model to be tested; (b) evaluate the model to ensure identification; (c) select appropriate measures for data collection, collect and prepare the data, and screen the data to identify outliers and ensure that SEM assumptions are met; (d) estimate the model by examining model fit, interpreting parameter estimates for the model, and examining equivalent or near-equivalent models; (e) respecify the model as necessary; and (f) report the results of the analysis. This six-step approach is consistent with Jöreskog's (1993) description of the model generating approach to SEM analysis.

With regards to step one of Kline's (2011) recommended procedure, a primary model consistent with the results of the literature review undertaken in Chapter II is shown in Figure 3. This model can be thought of as a visual representation of the hypothesized relationships between the constructs being examined in this study. The review of literature provided ample evidence for relationships between attachment

constructs and suicide risk as well as the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) and suicide risk.

In the primary model, it was hypothesized that the exogenous variable of attachment anxiety would directly and positively impact the endogenous variables of perceived burdensomeness (Kowal et al., 2012; Lee & Hankin, 2009; Wei et al., 2005), thwarted belongingness (Feeney, 2006; Knoke et al., 2010; Pereira et al., 2013), and acquired capability for suicide (Hadland et al., 2012; van Ijzendoorn et al., 1999), while the exogenous variable of attachment avoidance would directly and negatively impact the endogenous variables of perceived burdensomeness and thwarted belongingness and directly and positively impact the endogenous variable of acquired capability for suicide (Baer & Martinez, 2006; Perales et al., 2012). Further, it was hypothesized that the exogenous variable of attachment anxiety would have a positive indirect effect on suicide risk (Lizardi et al., 2011; Wright et al., 2005) through the fully mediating endogenous variables of perceived burdensomeness, thwarted belongingness, and acquired capability for suicide while the exogenous variable of attachment avoidance would have an indirect negative effect on suicide risk (Gormley & McNiel, 2009; Lessard & Moretti, 1998; Stepp et al., 2008) through the mediating endogenous variables of perceived burdensomeness and thwarted belongingness and an indirect positive effect on suicide risk (de Jong, 1992; Violato & Arato, 2004) through the mediating endogenous variable of acquired capability for suicide. Lastly, endogenous variables of perceived burdensomeness (Jahn & Cukrowicz, 2011; Van Orden et al., 2006), thwarted belongingness (Bryan, Hernandez, et al., 2013; Hawkins et al., 2014), and acquired capability for suicide (Bryan et al., 2012; Van Orden, Witte, Gordon, et al., 2008) were

hypothesized to directly and positively impact suicide risk. In addition, and in accordance with recommendations from Kline (2011), an a priori alternative model (see Figure 4) in which the primary model was nested was also proposed. Because the literature examining the link between suicide risk and attachment constructs remains rather sparse (Mikulincer & Shaver, 2007), it was not possible to rule out the presence of a direct link between attachment constructs and suicide risk in designing this study. As such, the a priori alternative model included all of the above effects as well as direct positive effects between both attachment constructs and suicide risk.

The process of identification, the second step in Kline's (2011) recommended procedure, relates to ensuring that it is statistically possible to derive a unique solution within a structural equation model. That is, "a model is identified if it is theoretically possible for the computer to derive a unique estimate of every model parameter" (Kline, 2011, p. 93). Because a two-step process for model evaluation (described below) was utilized, it was necessary to assess for identification of both the measurement and structural models that were used. According to Kline (2011), all measurement models with two or more factors that have two or more indicators per factor are identified. Because parceling (described below) was utilized when necessary to ensure the presence of at least three indicators per factor being assessed, the measurement model for this study can be considered to be identified. Kline (2011) notes that in order for structural models to be considered identified they must have degrees of freedom greater than or equal to zero and each latent variable within the structural model must have an assigned scale metric. All of the models that were analyzed for this study can be considered to be over-identified (i.e., they have degrees of freedom greater than 0) because the number of

parameters to be estimated is smaller than the number of observations. In order to fulfill the second criterion for identification, a unit loading identification constraint was utilized such that the direct effect for one of the indicators for each latent variable was fixed at 1.0, thereby creating a reference variable for each factor.

For the third step in the data analysis procedure, a set of measures that have been found to be empirically sound among samples similar to the sample for this study was selected. Each of these measures is discussed earlier in this chapter. Once data were collected, they were screened for multicollinearity, missing data, and outliers, and also assessed the assumptions of SEM which include multivariate normality, linearity, homoscedasticity, and appropriately scaled relative variances (Kline, 2011). In order to assess for multicollinearity, squared multiple correlations (SMC) and variance inflation factors (VIF) for the included variables were examined. SMC values greater than .90 and VIF values greater than 10.0 indicated problems related to multicollinearity (Kline, 2011). Missing data were examined and, in lieu of listwise deletion or other generally inadvisable methods of dealing with missing data (Schlomer, Bauman, & Card, 2010), estimated through the use of the expectation-maximization method built into SPSS 23.0.0.0 (IBM Corp., 2015). This technique has been found to be more useful in managing missing data than listwise deletion or single imputation methods (Kline, 2011; Schlomer et al., 2010). Outliers were assessed for by evaluating Mahalanbois distance values and scatterplots of standardized residuals. Any potential outliers were then examined to determine whether they represented invalid responses or errors in data entry prior to deciding whether to remove them from the analysis.

In order to assess for multivariate normality, Mardia's (1970) tests of multivariate skewness and kurtosis was examined first. However, given the relatively large sample size utilized in this study, these tests are likely to be significant even if any nonnormality in the data is small and therefore unimportant (Kline, 2011). As such, univariate examination of skewness and kurtosis for each assessed variable was undertaken as well. Per recommendations, skew index values greater than 2.0 were considered suspect while skew index values greater than 3.0 were considered to be representative of extreme skewness (Curran, West, & Finch, 1996). Similarly, kurtosis index values greater than 7.0 were considered to be moderately nonnormal while values greater than or equal to 21.0 were considered to indicate an extremely kurtotic nonnormal distribution (Curran et al., 1996). As a final test of nonnormality, normal probability plots were visually examined for any obvious deviations from normality (Kline, 2011). No data were severely nonnormal, so there was no need to undertake appropriate transformations (e.g., Box-Cox, polynomial, square root; Tabachnick & Fidell, 2012). Linearity and homoscedasticity were assessed using scatterplots and normal probability plots of standardized residuals respectively, and any difficulties with variance scaling were managed by multiplying variables by a constant in an effort to bring variances in line with one another, a process that necessarily does not affect the remainder of the analysis (Kline, 2011).

In step four of the analysis, the a priori models that were constructed were tested. Kline (2011) outlines a two-step process for testing models that involves first testing the measurement model through the use of confirmatory factor analysis (CFA) in order to ensure that the measurement model fits the data. Assuming that the results of the CFA are

satisfactory, Kline (2011) recommends that the structural model be assessed next. This includes comparing the primary model to an alternative proposed model in an effort to find a sufficiently parsimonious model that still provides a good fit for the data. Weston and Gore (2006) note that the test of the measurement model can be thought of in the context of assessing whether or not the chosen instruments or indicators are truly measuring the constructs or the latent factors that they are supposed to be measuring, while the test of the structural model assesses the interrelationship between the latent factors.

In developing the measurement model in SEM, it is important that each latent factor have more than a single indicator (Coffman & MacCallum, 2005). More specifically, Little (2013) has suggested the use of three indicators for each latent factor which simplifies the testing of model parameters because it creates a just-identified measurement space and therefore necessarily fits the data perfectly (Little, Rhemtulla, Gibson, & Schoemann, 2013). Because several of the latent factors in my model (i.e., attachment constructs, perceived burdensomeness, thwarted belongingness, and acquired capability for suicide) were measured by a single scale, it was necessary to parcel items from these scales so that they represented more than one indicator. Parceling items from single scales is well accepted in the SEM literature (Kline, 2011; Landis, Beal, & Tesluk, 2000; Little et al., 2013) and researchers have advocated the use of parcels to create structural models beyond path diagrams (Coffman & MacCallum, 2005). In parceling, items are grouped together based on specific criteria to form a smaller number of indicators. For the purposes of this study, a balanced parceling method, as described by Little, Cunningham, Shahar, and Widaman (2002), was utilized. The first step in

developing parcels involved performing an exploratory factor analysis on each scale that was used in this study. In this exploratory factor analysis, a unidimensional/single-factor solution was forced. Per recommendations, (Little et al., 2013; Matsunaga, 2008), three parcels were then created for each scale. The item with the highest factor loading for each scale was paired with the item with the lowest factor loading for that scale in order to create the first parcel, the item with the second highest factor loading was paired with the item with the second lowest factor loading to create the second parcel, and the item with the third highest factor loading was paired with the item with the third lowest factor loading to create the third parcel. Additional items were added to these three parcels in reverse order such that the item with the fourth lowest factor loading was added to the third parcel, the item with the fifth lowest factor loading was added to the second parcel, and so on until all items were parceled into three separate indicators. Parcel values were calculated as the mean of items included in the parcel as opposed to the sum which could create difficulties if parcels contained different numbers of items (Little et al., 2013).

Once the measurement model with appropriate parcels was created, it was necessary to then estimate the parameters for each model (Kline, 2011). The most common method for estimating parameters within SEM analysis, the Maximum Likelihood (ML) method (Kline, 2011), was used in this study. In spite of the ML estimation method's purportedly rather strict assumption of multivariate normality (Kline, 2011), researchers have found that this method is actually rather robust with regards to nonnormality (Olsson, Foss, Troye, & Howell, 2000), performing as well as or better than other methods (e.g., Weighted Least-Squares; WLS) more commonly used with nonnormal data (Schermelleh-Engel, Moosbrugger, & Müller, 2003). While it is true

that much of the data that were collected were, in fact, ordinal in nature, the data were treated as continuous because the data were relatively normal. This method of analysis is consistent with findings that treating ordinal data as continuous in SEM using an ML estimation method is reasonable provided the data are relatively normal and a sufficient number of categories (i.e.,  $\geq 4$ ) are used for the ordinal data (Bentler & Chou, 1987; Green, Akey, Fleming, Hershberger, & Marquis, 1997). Further, Kline (2011) notes that it is common for item parcels created from responses to Likert-type scale items to be treated as continuous variables.

In addition to assessing parameter estimates, it is important to examine fit indices in order to obtain information related to how well the proposed model fits the collected data (Kline, 2011). Model fit refers to the accuracy with which a specific model is able to explain the relationships between latent factors, and can be assessed using various absolute and approximate fit measures (Hu & Bentler, 1999; Kline, 2011). There are a plethora of fit indices available, some of which serve as measures of goodness-of-fit and others of which serve as measures of badness-of-fit (Kline, 2011). The current study utilized a model chi-square statistic along with multiple approximate fit indices that approach assessment of fit in varying ways as has been recommended by researchers (Hu & Bentler, 1998, 1999; Kline, 2011).

The first measure of fit that was utilized is the model chi-square. The model chi-square statistics provides information related to how consistent a proposed model is with a model that perfectly fits the data (Kline, 2011). In other words, the model chi-square test compares a proposed over-identified model, meaning a model with greater than zero degrees of freedom, to the just-identified model within which the over-identified model is



nested. Because just-identified models will always fit the data perfectly, they will also always result in a model chi-square statistic equal to zero (Kline, 2011). The model chi-square is a measure of absolute model fit with higher values for the model chi-square test indicating poorer fit and lower values indicating better fit (Kline, 2011). The null hypothesis for the model chi-square test is that there is no difference between the proposed model that is being tested and a just-identified model (Barrett, 2007). As such, a significant model chi-square statistic in which the null hypothesis is rejected is suggestive of poor fit. However, due to the increased power of this test that results from the large sample sizes often used in SEM, it is not uncommon for a model to fail the model chi-square fit test and yet still be used in additional analyses (Barrett, 2007) including the examination of approximate fit indices (Kline, 2011) which will be discussed next.

The Bentler (1990) Comparative Fit Index (CFI) is an incremental goodness-of-fit index that compares the fit of the proposed model to a baseline model in order to assess fit improvement (Kline, 2011). This index is relatively robust with regards to sample size (Bentler, 1990) and has been found to be less affected by nonnormality than many other fit indices (Hutchinson & Olmos, 1998). CFI values range from 0 to 1.0 with researchers suggesting cutoff values of .90 (Weston & Gore, 2006) or, even more stringently, .95 (Hu & Bentler, 1999) as indicative of good fit.

Like the CFI, the Nonnormed Fit Index (NNFI; Bentler & Bonett, 1980), also known as the Tucker-Lewis Index (TLI), is another incremental goodness-of-fit index used to compare the fit of a proposed model to a baseline model. It has a suggested cutoff of 0.95 for adequate fit (Hu & Bentler, 1999). The NNFI has a typical range of 0.0 to 1.0, although because it is nonnormative in nature values can at times fall outside of this

range (Bentler, 1990; Schermelleh-Engel et al., 2003). Like the CFI, the NNFI is also more robust to nonnormality than many other fit indices (Hutchinson & Olmos, 1998).

In addition to goodness-of-fit indices described above, two badness-of-fit indices were also utilized. The Root Mean Square Error of Approximation (RMSEA; Steiger, 1990) and the Standardized Root Mean Square Residual (SRMR; Bentler, 1995) are two such indices, both of which can take values ranging from 0 to 1.0. Unlike CFI and NNFI, RMSEA and SRMR are absolute fit indices, meaning that they assess for the fit of the model in general as opposed to in relation to a baseline model (Kline, 2011). Because RMSEA and SRMR are badness-of-fit measures, values closer to 0 are interpreted as indicative of better fit. Hu and Bentler (1999) suggested cutoff scores of less than or equal to .06 and .08 for RMSEA and SRMR respectively as indicative of good fit. Also of note, RMSEA is a parsimony-adjusted index meaning that the complexity of a given model is taken into account when calculating this statistic (Kline, 2011); the 90% confidence interval is also frequently reported for the RMSEA and was included in this study.

After assessing for model fit using the procedure outlined above, the primary or alternative models were examined to determine whether they provided sufficiently good fit of the data to be retained. In the event that both models provided adequate fit, a chi-square difference test would have been conducted. In order to calculate the chi-square difference statistic, model chi-square values and degrees of freedom for both models are subtracted from one another resulting in a single chi-square statistic equal to the difference between the model chi-square values for the two models being assessed and a single value for degrees of freedom equal to the difference between the degrees of

freedom for the two models being assessed (Martens, 2005). These values are then used to determine significance using a standard chi-square distribution table with a statistically significant result indicating that the model with the fewest parameters displays statistically significant better fit (Martens, 2005). This is especially important when comparing more and less complex models due to the importance of parsimony in model selection. As noted by Loehlin (2004), “The smallest number of variables connected by the smallest number of arrows that can do the job is [...] to be sought for, because it represents the most parsimonious explanation of the phenomenon under consideration” (p. 5).

Because neither of my a priori constructed models provided adequate fit of the data, it was necessary to respecify the model consistent with step five of Kline’s (2011) recommended procedure. This involved making changes to the model that are consistent with underlying theory in order to provide a better fit for the data. One potential example of such a change would be the inclusion of a direct effect on suicide risk for only one of attachment anxiety or attachment avoidance. Once a parsimonious model with good fit was identified, the significance of parameter estimates was assessed in order to ensure the utility of the model since the presence of very few significant parameter estimates would result in a model that is rather meaningless (Weston & Gore, 2006).

For the sixth and final step of my data analysis, the results of the analysis were reported in a manner consistent with recommended guidelines (Weston & Gore, 2006) in Chapter IV of this document. This involved reporting all fit indices including model chi-square, CFI, NNFI, RMSEA and SRMR, as well as both standardized and unstandardized parameter estimates. Respecification of the model was discussed as part of this final step.

## CHAPTER IV

### RESULTS

A missing values analysis was conducted in order to examine patterns of missing data for this study's 435 participants. Results revealed a total of 15 missing values affecting 14 different items and 11 different participants. Researchers have recommended against the use of listwise deletion strategies for addressing missing data (Schlomer et al., 2010), at least in part because this method tends to increase the size of standard errors when compared to full data sets (Kline, 2011). As such, an expectation-maximization strategy was utilized to impute missing data points. Unlike some other multiple imputation methods, expectation-maximization provides a single data set with imputed values that can then be used for continued analysis (Schlomer et al., 2010).

Data for these 435 participants were then screened for multicollinearity. In order to assess for multicollinearity, a total of eight multiple regression analyses were conducted with total scores for each of the variables measured in this study serving as the criterion variable in one analysis and scores for the remaining variables serving as predictors in each model (Kline, 2011). For example, the first analysis involved the regression of variables representing total scores for attachment anxiety, attachment avoidance, perceived burdensomeness, thwarted belongingness, acquired capability for suicide, and scale scores for the SHBQ and SBQ-R onto the total score for the ASIQ. Squared multiple correlations ( $R^2_{smc}$ ) and variance inflation factors (VIF) were calculated

for each variable with cutoff values of  $R^2_{smc} > .90$  and  $VIF > 10.0$  suggesting the presence of severe multicollinearity (Kline, 2011). Results showed that  $R^2_{smc}$  values ranged from a low of .01 to a high of .69, while VIF values ranged from a low of 1.0 to a high of 3.2. None of these values fell outside of the specified ranges, suggesting no concerns related to multicollinearity.

Data were then subjected to a multivariate outlier analysis using the procedure outlined by Kline (2011). Specifically, the Mahalanobis distance for each participant was calculated by regressing total scores for each of variables of interest onto a variable that was calculated by summing the total scores from each of the measures of self-reported suicide risk. The square of the Mahalanobis distance, which is distributed as a central chi-square statistic with degrees of freedom equal to the number of variables (Kline, 2011, p. 54) was then evaluated with regards to the appropriate chi-square distribution, and responses with  $p$ -values  $< .001$  were considered to be potential outliers. Data for a total 16 participants were identified using this procedure. Scatterplots of standardized residuals were then evaluated with a focus on data from the 16 participants identified in the previous step. The data for these participants were examined for data entry errors and the presence of invalid responses with no such errors being found. As such, these entries were assumed to represent valid data and the full remaining data set including a total of 435 participants was utilized for the analyses that follow. Descriptive statistics and intercorrelations based on the full data set for each scale used in this study are shown in Table 1.

Table 1

*Correlations and Descriptive Statistics for All Measures*

	1	2	3	4	5	6	7	8	Mean	SD	$\alpha$
1. ANX	-								58.52	24.64	.94
2. AVOID	.305**	-							54.44	22.15	.94
3. PB	.435**	.228**	-						9.91	6.91	.95
4. TB	.355**	.375**	.551**	-					23.00	11.55	.87
5. ACSS	.006**	.024	.086	.013	-				41.65	12.12	.80
6. ASIQ	.376**	.190**	.617**	.397**	.107*	-			16.65	24.24	.98
7. SBQ-R	.438**	.229**	.615**	.438**	.148**	.673**	-		5.85	3.10	.80
8. SHBQ	.271**	.170**	.415**	.301**	.134**	.518**	.714**	-	7.74	11.68	.67

*Note.* \*\* indicates  $p < .01$ , \* indicates  $p < .05$

ANX = ECR-R Attachment Anxiety subscale, AVOID = ECR-R Attachment Avoidance subscale, PB = INQ Perceived Burdensomeness subscale, TB = INQ Thwarted Belongingness subscale, ACSS = Acquired Capability for Suicide Scale, ASIQ = Adult Suicidal Ideation Questionnaire, SBQ-R = Suicide Behaviors Questionnaire – Revised, SHBQ = Self-Harm Behavior Questionnaire.

### Examination of Assumptions

Kline (2011) described a number of techniques that allow for the examination of appropriate assumptions for SEM analysis, specifically including the assumptions of multivariate normality, linearity, homoscedasticity, and equal relative variances. In assessing for the presence of multivariate nonnormality, Mardia's (1970) tests of multivariate skewness and kurtosis were utilized first. The results of both of these tests were significant ( $p < .001$ ). However, a significant result is common when analyses involve large samples (Kline, 2011). As such, tests of univariate normality were examined next. The total scores for each of the variables of interest were evaluated for univariate normality using seven criteria which define skewness values of  $\geq |2.0|$  and  $\geq |3.0|$  as moderately and extremely skewed respectively and kurtosis values of  $\geq |7.0|$  and  $\geq |21.0|$  as moderately and extremely leptokurtic respectively. Because SPSS reports excess kurtosis instead of a pure kurtosis statistic (Kim, 2013), three was added to each kurtosis statistic obtained prior to evaluating normality. Results showed that responses related to perceived burdensomeness (skewness = 2.26, kurtosis = 8.108) and the ASIQ measure of suicidal ideation (skewness = 2.921, kurtosis = 13.146) were both moderately positively skewed and moderately leptokurtic. Because the evaluation of normality did not suggest that the distribution of any variables fell into the extremely nonnormal range, the decision was made to continue with the analysis in question. However, to account for the moderate nonnormality in some scales the Satorra-Bentler scaled  $\chi^2$  statistic (Satorra & Bentler, 1988), which is far more robust to nonnormality than the standard  $\chi^2$  statistic, was utilized when conducting the SEM analyses.

The presence of a linear relationship between predictor and outcome variables and the assumption of homoscedasticity were assessed next via the examination of scatterplots and normal probability plots of standardized residuals (Kline, 2011). Results of the examination of these plots showed no major concerns related to these assumptions. Finally, the assumption of equal relative variances was assessed by calculating the variances for each of the variables in question and ensuring that the ratio of the largest variance to the smallest variance was  $\leq 10.0$  (Kline, 2011). Results of this examination suggested that variables related to both perceived burdensomeness and the total score for the SBQ-R were ill-scaled, with ratios between variance for these scores and the largest variance of 12.7 and 63.1 respectively. In order to correct for ill-scaled variance, values for perceived burdensomeness were multiplied by 2.0 while values for the total score of the SBQ-R were multiplied by 5.0. Kline (2011) notes that such a correction does not impact the outcome of the SEM analysis because linear transformations such as these do not change the correlation between variables. After screening the collected data, examining the assumptions of SEM, and making necessary adjustments to the data in order to account for difficulties identified, the data were parceled as described in Chapter 3 in order to ensure that there were a total of three indicators for each latent factor. Descriptive statistics and intercorrelations between indicators to be used in the CFA and SEM analyses for this study were calculated and are shown in Table 2.

### **Confirmatory Factor Analysis of the Measurement Model**

A confirmatory factor analysis (CFA) of the measurement model for the SEM analysis was completed next (Kline, 2011). Because all of the latent factors in the model being assessed in this study have exactly three indicators, the measurement space for each



Table 2

*Correlations and Descriptive Statistics for All Indicators*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Mean	SD
1. ANX1	-																		3.32	1.39
2. ANX2	.832*	-																	3.50	1.46
3. ANX3	.845*	.823*	-																2.94	1.51
4. AVD1	.227*	.238*	.333*	-															3.13	1.28
5. AVD2	.233*	.235*	.342*	.892*	-														3.02	1.28
6. AVD3	.246*	.262*	.362*	.870*	.895*	-													2.92	1.27
7. PB1	.404*	.421*	.452*	.203*	.227*	.208*	-												3.59	2.65
8. PB2	.369*	.383*	.412*	.190*	.211*	.197*	.874*	-											3.12	2.24
9. PB3	.342*	.352*	.379*	.222*	.224*	.205*	.863*	.883*	-										3.20	2.33
10. TB1	.311*	.330*	.345*	.314*	.364*	.343*	.523*	.494*	.462*	-									2.54	1.35
11. TB2	.309*	.339*	.350*	.315*	.350*	.333*	.539*	.503*	.487*	.844*	-								2.71	1.47
12. TB3	.244*	.238*	.293*	.294*	.325*	.343*	.464*	.442*	.432*	.784*	.681*	-							2.41	1.37
13. ACSS1	.065	.008	.044	.011	.012	-.011	.057	.050	.064	-.015	-.018	-.004	-						2.24	0.71
14. ACSS2	.008	-.017	.032	.049	.068	.036	.104	.138*	.152*	.079	.057	.086	.537*	-					1.93	0.69
15. ACSS3	-.013	-.087	-.013	.014	.010	-.019	-.011	.021	.049	-.021	-.064	-.017	.700*	.616*	-				2.08	0.72
16. ASIQ	.338*	.366*	.359*	.195*	.180*	.174*	.592*	.583*	.596*	.358*	.400*	.336*	.111	.131*	.027	-			0.67	0.97
17. SBQ-R	.399*	.427*	.413*	.232*	.221*	.206*	.615*	.558*	.588*	.398*	.458*	.348*	.152*	.186*	.034	.673*	-		7.31	3.88
18. SHBQ	.242*	.283*	.241*	.172*	.157*	.161*	.439*	.366*	.381*	.271*	.310*	.248*	.149*	.149*	.040	.518*	.714*	-	1.93	2.92

Note. \* indicates  $p < .01$

ANX = Parcels from the ECR-R Attachment Anxiety subscale, AVD = Parcels from the ECR-R Attachment Avoidance subscale, PB = Parcels from the INQ Perceived Burdensomeness subscale, TB = Parcels from the INQ Thwarted Belongingness subscale, ACSS = Parcels from the Acquired Capability for Suicide Scale, ASIQ = Adult Suicidal Ideation Questionnaire, SBQ-R = Suicide Behaviors Questionnaire – Revised, SHBQ = Self-Harm Behavior Questionnaire.

of these latent factors is just-identified (Little et al., 2013; Matsunaga, 2008) and as such necessarily provides a perfect fit for the data. Therefore, it is not necessary to conduct a CFA for the measurement model of each individual factor. Instead, the overall measurement model was subjected to CFA by constructing a model that contained all latent factors within the model and allowed them to covary with one another (Kline, 2011). The CFA was conducted using Maximum Likelihood (ML) estimation and treating all data as continuous. As discussed above, due to evidence of mild to moderate nonnormality in two of the variables being assessed (i.e., perceived burdensomeness and ASIQ total score) the Satorra-Bentler scaled  $\chi^2$  statistic (Satorra & Bentler, 1988) was utilized. Fit was assessed using the criteria defined by Hu and Bentler (1999) described in Chapter III (i.e.,  $CFI$  and  $NNFI > 0.95$ ,  $RMSEA < .06$ ,  $SRMR < .08$ ). The results of this CFA which included data from all 435 participants showed a significant Satorra-Bentler scaled  $\chi^2$  statistic ( $\chi^2_{S-B} (120) = 223.91, p < .001$ ) suggesting inexact model fit. However, such an outcome is not uncommon when large sample sizes are utilized (Barrett, 2007). As such, the model fit indices were examined next and showed good overall fit for this measurement model ( $CFI_{S-B} = 0.982$ ,  $NNFI_{S-B} = 0.977$ ,  $SRMR = .039$ ,  $RMSEA_{S-B} = .045$ ). Because the 90% confidence interval for the  $RMSEA_{S-B}$  statistic was not available, the  $RMSEA$  statistic based on the non-corrected  $\chi^2$  value was also examined. Results showed that the standard  $RMSEA$  values of .051 [90% CI = .042-.059] also fell within the acceptable range.

### **Analysis of the Structural Model**

After conducting a CFA of the full measurement model and determining that it showed an adequate fit for the data, the primary structural model (see Figure 3) was

subjected to SEM analysis using data from all 435 participants, easily surpassing the recommended minimum of 200 participants (Barrett, 2007; Kline, 2011; Weston & Gore, 2006) necessary to obtain useful results. As with the CFA of the measurement model, the structural model was estimated using the ML method treating the data as continuous. Results from the analysis of this model are displayed in Figure 5. The majority of parameter estimates were statistically significant, with the exception of paths between attachment anxiety and acquired capability for suicide and between attachment avoidance and acquired capability for suicide. However, examination of fit indices (see Table 3) suggested poor fit for the data. The alternative a priori model (see Figure 4) was examined next.

Analysis of the alternative a priori model in which direct paths between the latent factors of attachment anxiety and suicide risk and attachment avoidance and suicide risk were added showed similar results (see Figure 6) to those of the primary structural model. Specifically, the majority of parameter estimates were once again statistically significant. However, within the alternative model not only were the paths between attachment anxiety and acquired capability for suicide and between attachment avoidance and acquired capability for suicide not significant, but the path between thwarted belongingness and suicide risk lost significance as well. The added path between attachment avoidance and suicide risk was also not statistically significant though the added path between attachment anxiety and suicide risk was. Examination of fit indices once again suggested relatively poor model fit (see Table 3). Given that the primary structural model provided a more parsimonious explanation for relationships between the constructs of interest and that the alternative model provided only marginally better fit

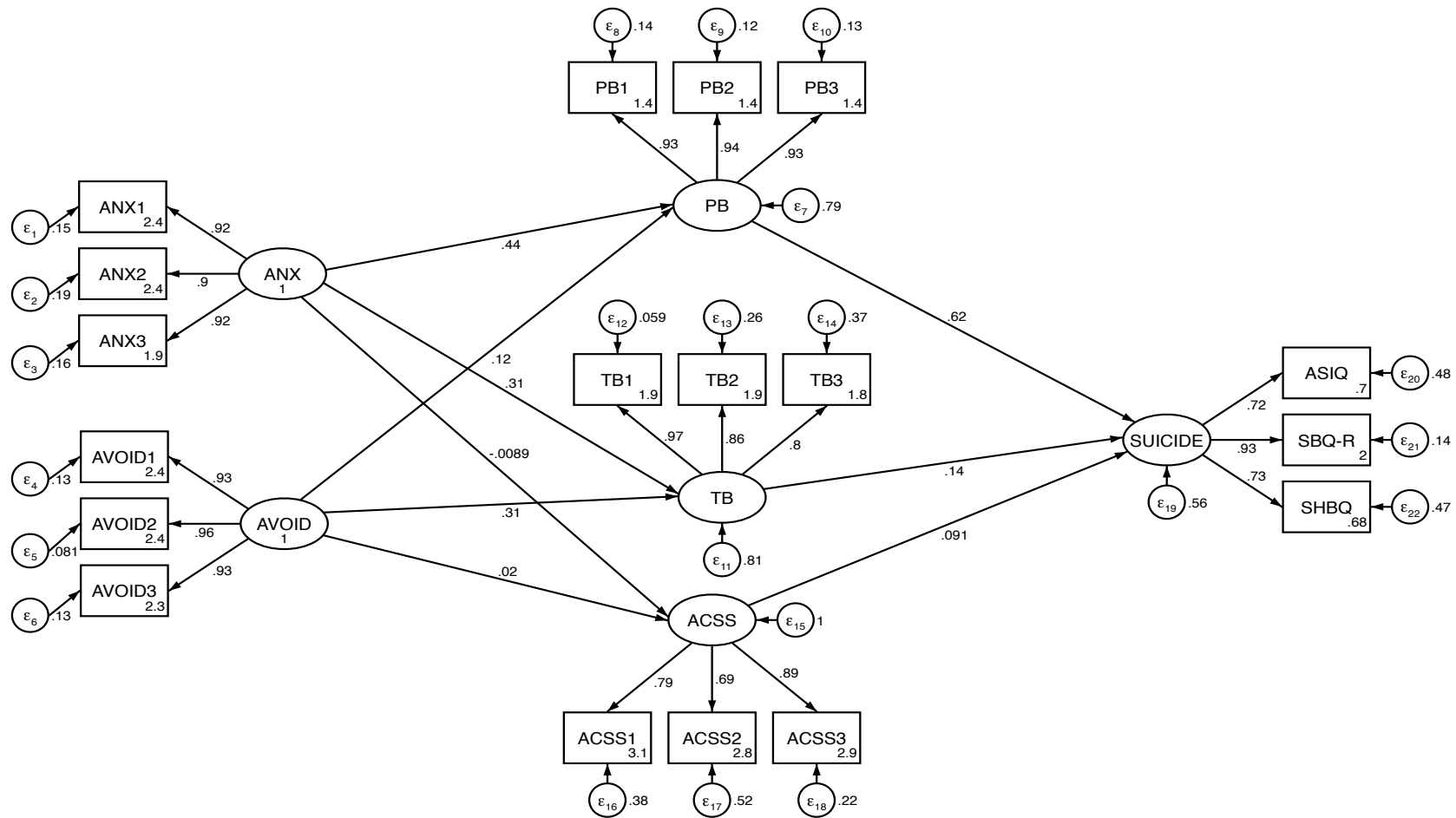


Figure 5. Primary a priori structural model. Estimates are reported as standardized parameters. Estimates for disturbances ( $\epsilon$ ) represent the proportion of unexplained variance. ANX = Attachment Anxiety, AVOID = Attachment Avoidance, PB = Perceived Burdensomeness, TB = Thwarted Belongingness, ACSS = Acquired Capability for Suicide, ASIQ = Adult Suicide Ideation Questionnaire, SBQ-R = Suicide Behavior Questionnaire – Revised, SHBQ = Self-Harm Behavior Questionnaire.

Table 3

*Overall Model Fit Statistics for the Structural Models*

Model	$\chi^2$	$\chi^2_{S-B}$	<i>df</i>	$\chi^2$ difference	$CFI_{S-B}$	$NNFI_{S-B}$	$RMSEA$	90% <i>CI</i>	$RMSEA_{S-B}$	$SRMR$
1	408.28*	361.64*	126	-	.959	.950	.072	.064-.080	.066	.122
2	389.83*	346.22*	124	15.42*	.961	.952	.070	.062-.078	.064	.119
3	276.08*	243.06*	124	103.16*	.979	.974	.053	.045-.062	.047	.048
4	257.23*	226.95*	122	16.11*	.982	.977	.050	.042-.059	.044	.043

*Note.* \* indicates  $p < .001$ .

Model 1 = Primary Model; Model 2 = Alternative Model; Model 3 = Respecified Primary Model (Final Model); Model 4 = Respecified Alternative Model.

$\chi^2_{S-B}$  = Satorra-Bentler scaled chi-squared statistic;  $CFI_{S-B}$  = comparative fit index based on  $\chi^2_{S-B}$ ;  $NNFI_{S-B}$  = non-normed fit index based on  $\chi^2_{S-B}$ ;  $RMSEA$  = root mean square error of approximation;  $RMSEA_{S-B}$  = root mean square error of approximation based on  $\chi^2_{S-B}$ ;  $SRMR$  = standardized root mean square residual.

Table 4

*Parameter Estimates for Structural Paths for the Final Model*

Parameter	Unstandardized		Standardized		<i>P</i> value
	Coefficient	SE	Coefficient	SE	
Anxiety → PB	.841	.108	.432	.044	< .001
Anxiety → TB	.292	.050	.286	.018	< .001
Anxiety → ACS	-.004	.026	-.008	.052	.870
Avoidance → PB	.206	.087	.102	.043	.018
Avoidance → TB	.315	.050	.298	.048	< .001
Avoidance → ACS	.010	.029	.020	.056	.723
PB → Suicide Risk	3.565	.347	.610	.052	< .001
TB → Suicide Risk	1.394	.519	.125	.047	.007
ACS → Suicide Risk	2.016	.847	.088	.036	.015
Anxiety ↔ Avoidance	.503	.077	.322	.046	< .001
PB ↔ TB	1.163	.160	.469	.045	< .001

*Note.* ACS = Acquired Capability for Suicide, PB = Perceived Burdensomeness, TB = Thwarted Belongingness.

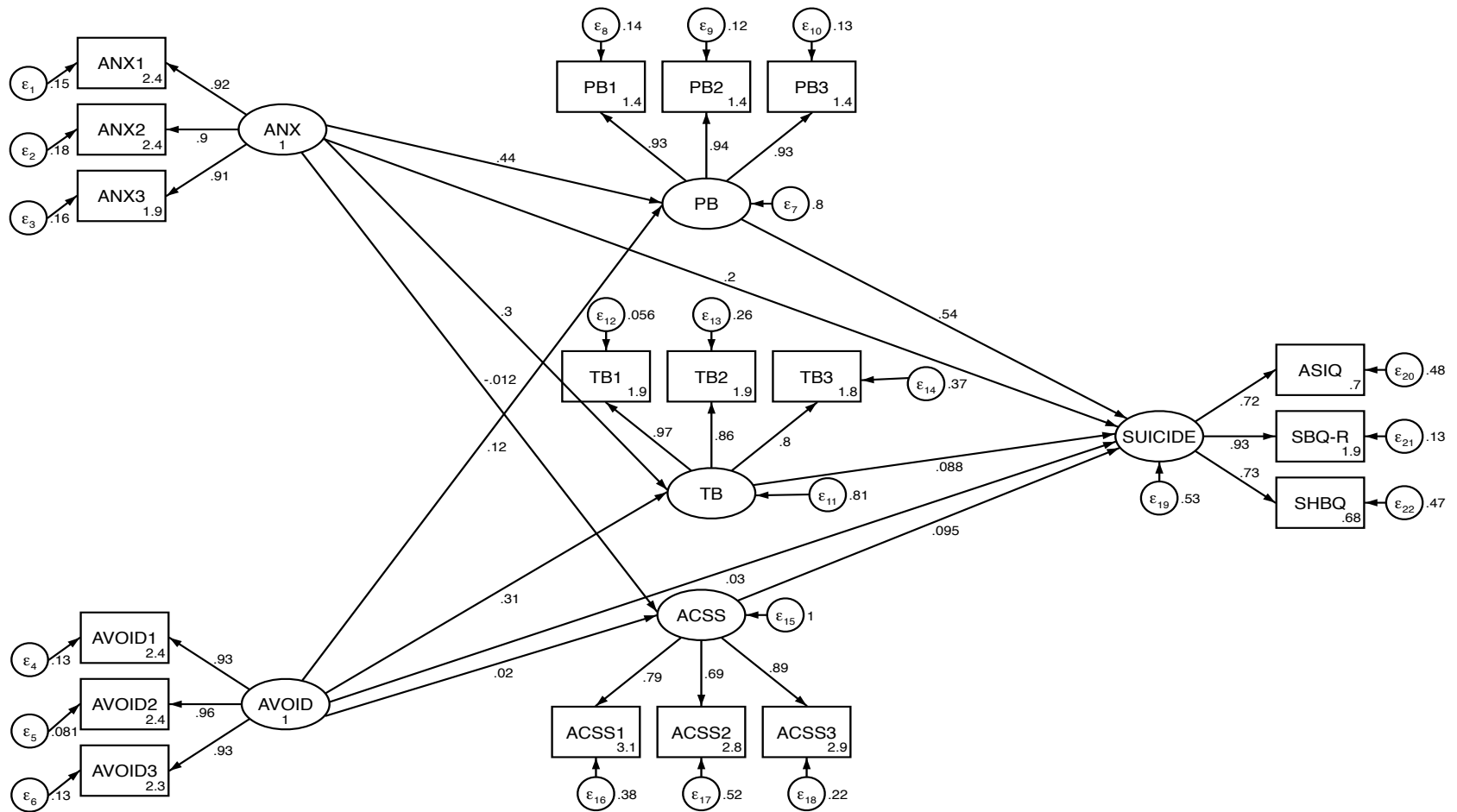


Figure 6. Alternative a priori structural model. Estimates are reported as standardized parameters. Estimates for disturbances ( $\epsilon$ ) represent the proportion of unexplained variance. ANX = Attachment Anxiety, AVOID = Attachment Avoidance, PB = Perceived Burdensomeness, TB = Thwarted Belongingness, ACSS = Acquired Capability for Suicide, ASIQ = Adult Suicide Ideation Questionnaire, SBQ-R = Suicide Behavior Questionnaire – Revised, SHBQ = Self-Harm Behavior Questionnaire.

when compared to the primary model, the decision was made to utilize the primary model as a base from which model respecification could begin as suggested by Kline (2011).

In an effort to optimize the model respecification process, the decision was made to examine modification indices (Kline, 2011). In order to conduct this examination, the primary a priori model was estimated using Stata 14.1 (StataCorp, 2015) and modification indices were calculated based on the fit of this model. The modification indices were then examined in order to identify paths that, if added to the primary a priori model, would provide for significantly better fit of the model. While this process involved analyzing all potential paths that could be added to the model, only specific paths whose addition would be consistent with underlying theory were given consideration. The results of this examination suggested that the addition of covariance paths between attachment anxiety and attachment avoidance as well as between perceived burdensomeness and thwarted belongingness would likely improve the fit of the measurement model. Both of these additions are consistent with theory and previous findings suggesting high interrelationships between attachment anxiety and attachment avoidance (e.g., Givertz et al., 2013) and between perceived burdensomeness and thwarted belongingness (e.g., Cero, Zuromski, Witte, Ribeiro, & Joiner, 2015; Van Orden et al., 2012).

Based on the analysis of modification indices a third, respecified model of the relationships between the constructs was subjected to SEM analysis. This respecified model (see Figure 7) included the covariances described above. The results of this analysis again showed that the majority of parameter estimates were statistically significant including those for the added covariances between attachment anxiety and



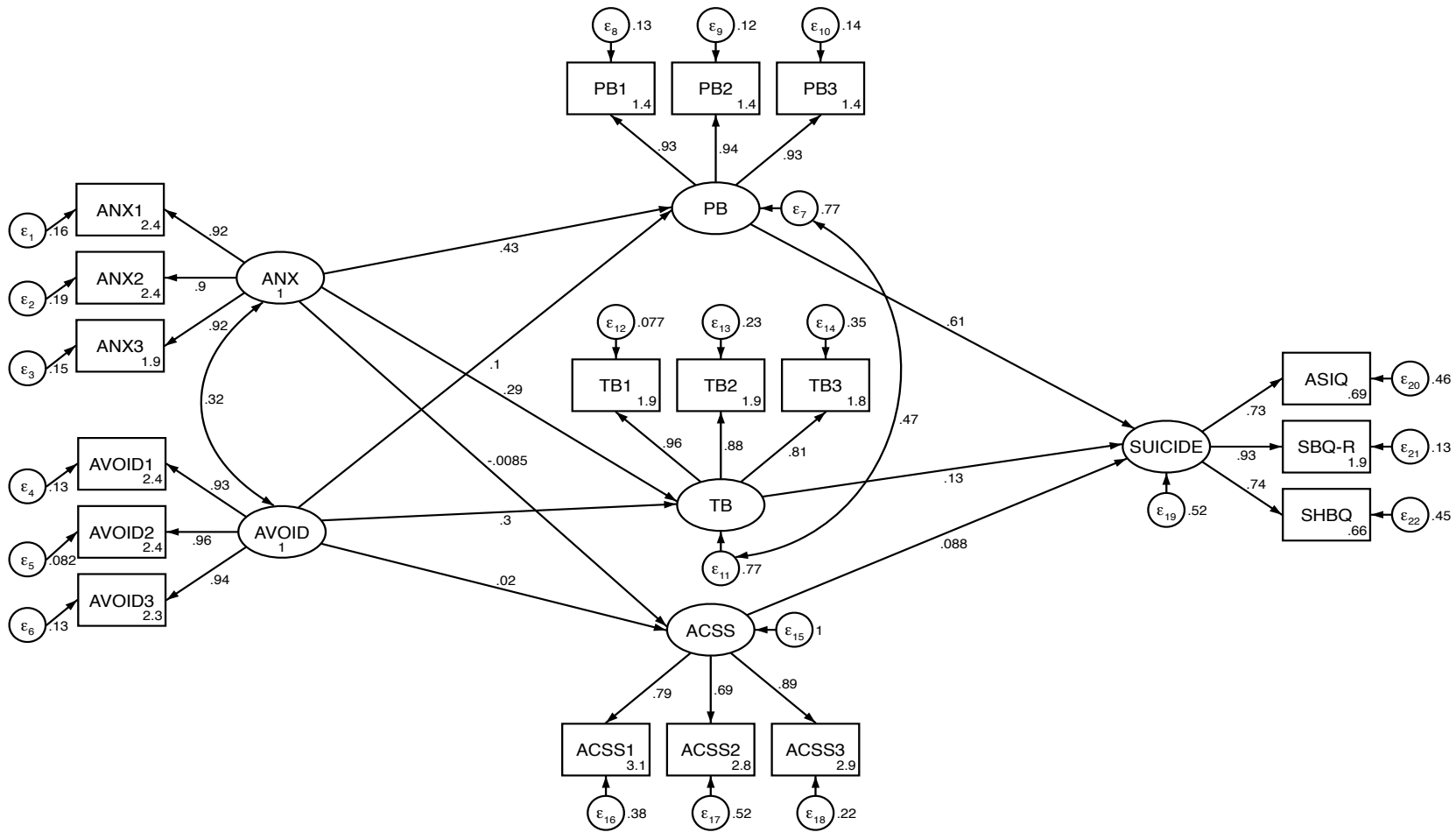


Figure 7. Final respecified model. Estimates are reported as standardized parameters. Estimates for disturbances ( $\epsilon$ ) represent the proportion of unexplained variance. ANX = Attachment Anxiety, AVOID = Attachment Avoidance, PB = Perceived Burdensomeness, TB = Thwarted Belongingness, ACSS = Acquired Capability for Suicide, ASIQ = Adult Suicide Ideation Questionnaire, SBQ-R = Suicide Behavior Questionnaire – Revised, SHBQ = Self-Harm Behavior Questionnaire.

attachment avoidance and between perceived burdensomeness and thwarted belongingness. As before, paths between attachment anxiety and acquired capability for suicide and between attachment avoidance and acquired capability for suicide remained non-significant. Fit indices for this model were examined next (see Table 3). While the model  $\chi^2$  for this model remained significant suggesting an inexact fit with the data, significant  $\chi^2$  values are common with large sample sizes and can therefore be misleading (Barrett, 2007). As such, additional fit indices were examined using criteria suggested by Hu and Bentler (1999).

Model 3 (Figure 7)  $CFI_{S-B}$  was .979 and  $NNFI_{S-B}$  was .974, both exceeding the cutoff criteria of  $> .95$ . The  $SRMR$  was .048, also falling well within the predetermined range of  $< .08$ . The  $RMSEA_{S-B}$  was .047, below the suggested cutoff of  $< .06$ . As noted above, because the 90% confidence interval for the  $RMSEA_{S-B}$  statistic was not available, the  $RMSEA$  statistic based on the non-corrected  $\chi^2$  value was also examined. Results showed that the standard  $RMSEA$  value of .053 [90% CI = .045-.062] also fell within the acceptable range. Taken together, these results indicate that the respecified model demonstrated good overall fit for the data. In addition, the parameter estimates for seven of the nine structural paths were statistically significant and could be meaningfully interpreted (see Table 4).

In order to ensure fidelity to the examination of initial hypotheses, the decision was made to construct a second respecified model based on the alternative a priori model (see Figure 4) by adding covariances between attachment anxiety and attachment avoidance as well as between perceived burdensomeness and thwarted belongingness. The results of SEM analysis of this model are shown in Figure 8. As with prior models,

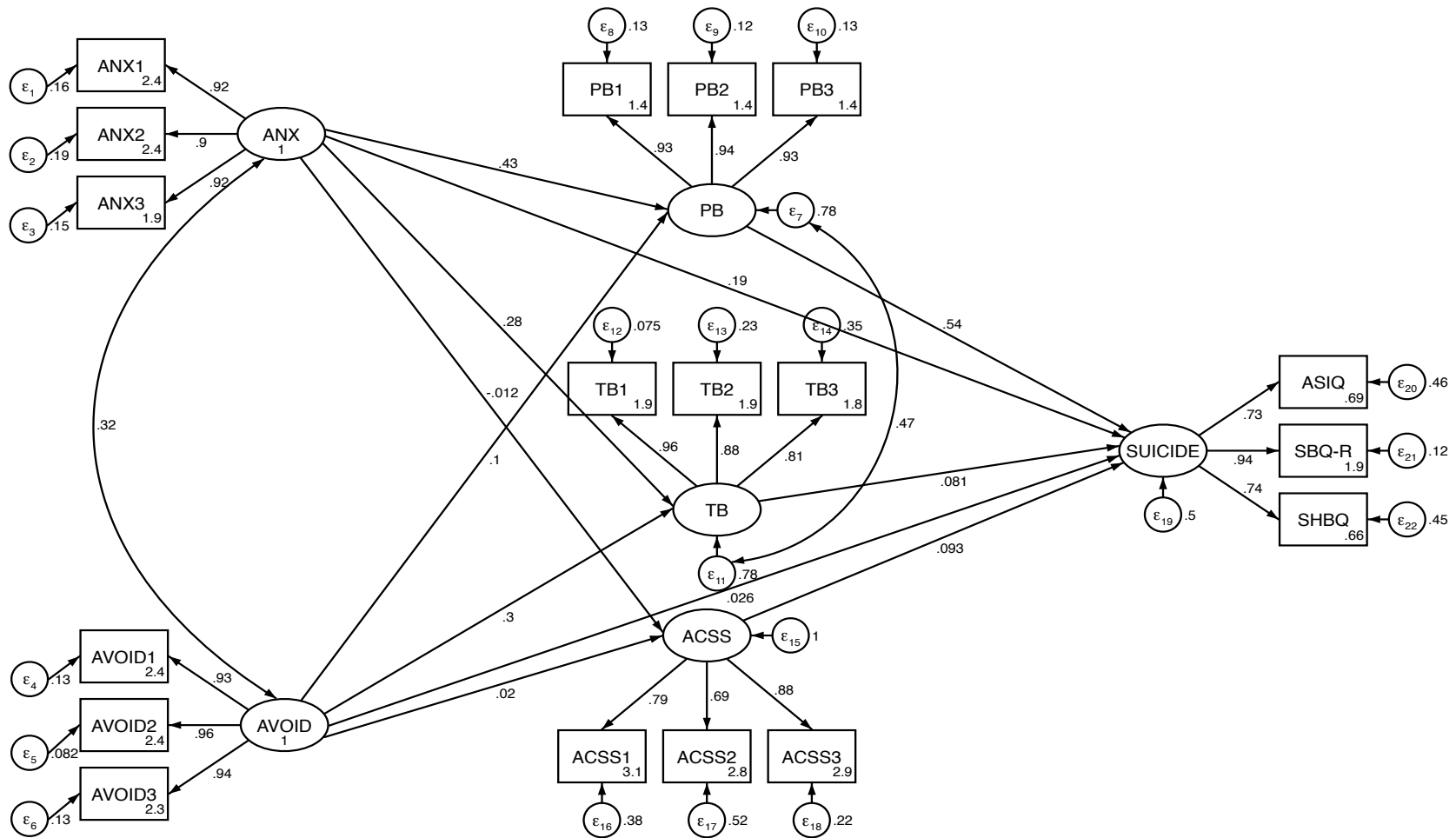


Figure 8. Respecified alternative model. Estimates are reported as standardized parameters. Estimates for disturbances ( $\epsilon$ ) represent the proportion of unexplained variance. ANX = Attachment Anxiety, AVOID = Attachment Avoidance, PB = Perceived Burdensomeness, TB = Thwarted Belongingness, ACSS = Acquired Capability for Suicide, ASI = Adult Suicide Ideation Questionnaire, SBQ-R = Suicide Behavior Questionnaire – Revised, SHBQ = Self-Harm Behavior Questionnaire.

many of the parameter estimates were statistically significant including the added link between attachment anxiety and suicide risk. Like the initial analysis of the alternative a priori model, analysis of the respecified alternative model showed insignificant paths not only between both attachment constructs and the acquired capability for suicide, but between both attachment avoidance and suicide risk and thwarted belongingness and suicide risk, as well. Analysis of fit indices again showed a significant model  $\chi^2$ . Additional fit indices fell into the acceptable range ( $CFI_{S-B} = .980$ ,  $NNFI_{S-B} = .977$ ,  $SRMR = .043$ ,  $RMSEA_{S-B} = .044$ ,  $RMSEA = .050$  [90% CI = .042-.059]) as described by Hu and Bentler (1999). The  $\chi^2$  difference statistic ( $\Delta\chi^2(2) = 16.11$ ,  $p < .001$ ) comparing results between the respecified primary and respecified alternative models was also significant, suggesting that the respecified alternative model was a significantly better fit for the data than the respecified primary model. However, because structural models with additional paths will necessarily provide a better fit for the data (Kline, 2011), the respecified alternative model was both less parsimonious (Loehlin, 2004) and had more non-significant parameter estimates than the respecified primary model, and the respecified primary model showed good fit for the data, the respecified primary model (see Figure 7) was chosen as the final model.

### **Interpretation of Structural Equation Model**

The final respecified model (see Figure 7) which included covariances between attachment and anxiety and attachment avoidance as well as between perceived burdensomeness and thwarted belongingness showed good overall fit for the data. While the model  $\chi^2$  statistic was significant ( $\chi^2(124) = 276.08$ ,  $\chi^2_{S-B}(124) = 243.06$ ,  $p < .001$ ), such findings are not uncommon when analyses are conducted using large sample sizes

(Barrett, 2007). Additional fit indices ( $CFI_{S-B} = .979$ ,  $NNFI_{S-B} = .974$ ,  $SRMR = .048$ ,  $RMSEA_{S-B} = .047$ ) all fell within the acceptable range as defined by Hu and Bentler (1999).

Interpretation of parameter estimates utilized Cohen's (1992) guidelines which describe parameter estimate values of  $< .10$  as indicative of a small effect size, parameter estimate values of approximately  $.30$  as indicative of a medium effect size, and parameter estimate values  $> .50$  as indicative of a large effect size. Results showed that attachment anxiety had statistically significant medium positive direct effects on both perceived burdensomeness (.432) and thwarted belongingness (.286) as well as a medium positive indirect effect on suicide risk (.299) through the mediating variables of perceived burdensomeness, thwarted belongingness, and acquired capability for suicide. The parameter estimate for the path between attachment anxiety and acquired capability for suicide (-.009) was not significant.

Attachment avoidance had a statistically significant small direct effect on perceived burdensomeness (.102) and a positive medium direct effect on thwarted belongingness (.298), as well as a small positive indirect effect on suicide risk (.101) through the mediating variables of perceived burdensomeness, thwarted belongingness, and acquired capability for suicide. As with attachment anxiety, the parameter estimate for the path between attachment avoidance and acquired capability for suicide was not statistically significant (.020). Approximately 22.6% of the variance in perceived burdensomeness ( $R^2 = .226$ ) and 22.5% of the variance in thwarted belongingness ( $R^2 = .225$ ) were explained by the attachment related constructs. Correlations between both

attachment anxiety and attachment avoidance (.322) and perceived burdensomeness and thwarted belongingness (.469) were statistically significant and medium in size.

Perceived burdensomeness had a statistically significant large positive direct effect on suicide risk (.610). Thwarted belongingness (.125) and acquired capability for suicide (.088) both had statistically significant small direct effects on suicide risk. A total of approximately 48.2% of variance in suicide risk was explained by the full model ( $R^2 = .482$ ).

## **CHAPTER V**

### **DISCUSSION**

Suicide is a leading cause of death among individuals in the United States (CDC, 2016) and around the world (WHO, 2014). With the rate of suicide among individuals in the United States rising steadily over the past ten years (National Center for Health Statistics, 2013), it is increasingly important that researchers work to understand factors that may contribute to suicide risk in order to support early identification and intervention for individuals struggling with suicidality (Cukrowicz, Schlegel, et al., 2011; Drum et al., 2009). The purpose of the present study was to examine the relationships between the attachment-based constructs of attachment anxiety and attachment avoidance (Brennan et al., 1998), the three constructs of the interpersonal-psychological theory of suicide (Joiner, 2005), and self-reported suicide risk in hopes that the identification of any such relationships would assist counseling psychologists and researchers alike in better understanding the factors that contribute to suicide risk.

While a comprehensive literature review provided evidence to support the idea that relationships between these constructs likely exist, to date no research has directly examined how they may interrelate. As a result, two a priori models (see Figures 3 and 4) were developed based on theory and available information detailing ways in which these

constructs could be structurally related. The following research questions were developed:

- Q1 Does the primary theoretical explanatory model (see Figure 3) adequately fit the observed relationships in the data?
- Q2 Does the primary model demonstrate a statistically better or more parsimonious fit to the observed interrelationships between these constructs in the data than the alternative model (see Figure 4)?

Because neither a priori model provided adequate fit for the data, two respecified models (see Figure 7 and Figure 8) were created by adding additional, theoretically-consistent covariance paths between the attachment-related constructs of attachment anxiety and attachment avoidance and between the perceived burdensomeness and thwarted belongingness constructs from the interpersonal-psychological theory of suicide (Joiner, 2005) to the primary and alternative a priori models. The addition of these covariances, as discussed below, suggests that the variables in question are interrelated and share at least one common unidentified cause (Kline, 2011). While both models showed good fit for the data per Hu and Bentler's (1999) guidelines, the respecified primary model had a larger proportion of significant paths and was a more parsimonious explanation for the data. As such, the respecified primary model (see Figure 7) was chosen as the best representation of the interrelationships between the constructs in question.

### **Attachment Style**

While not initially hypothesized, the final respecified model (see Figure 7) included the addition of a covariance between the constructs of attachment avoidance and attachment anxiety. This path was added during the model respecification phase of the data analysis portion of this study and significantly improved model fit when compared to a model that lacked this covariance. The relationship between attachment anxiety and



attachment avoidance is well documented in the literature (Mikulincer & Shaver, 2007; Shaver & Mikulincer, 2014), and as such the addition of this covariance was theoretically consistent. In addition, Kline (2011) notes that exogenous variables are essentially always assumed to covary in SEM analyses because, by definition, no attempt is being made to explain the cause of variance in them.

### **Attachment Anxiety**

The final respecified model (see Figure 7) showed relationships between attachment anxiety and several constructs of the interpersonal-psychological theory of suicide. Specifically, attachment anxiety was significantly related to the constructs of perceived burdensomeness and thwarted belongingness. This is consistent with prior evidence showing relationships between attachment anxiety and both feelings that one is a liability (Kowal et al., 2012) and self-hate (Arbona & Power, 2003; Lee & Hankin, 2009; Wei et al., 2005), important factors that make up the construct of perceived burdensomeness (Van Orden et al., 2010). Similarly, prior research has shown relationships between attachment anxiety and both loneliness (Berlin et al., 1995; Feeney, 2006; Knoke et al., 2010; Pereira et al., 2013) and a lack of reciprocal caring relationships (Brassard et al., 2014; Stronach et al., 2011), the two primary aspects that make up the construct of thwarted belongingness (Van Orden et al., 2010). This study, however, represents the first direct, explicit evidence of a link between attachment anxiety and these constructs of the interpersonal theory of the suicide.

Contrary to initial hypotheses, the results of this study did not show evidence of a significant relationship between attachment anxiety and the acquired capability for suicide. Such a link was hypothesized based on indirect evidence of a potential

relationship between childhood abuse and both attachment anxiety (Baer & Martinez, 2006; van Ijzendoorn et al., 1999) and the acquired capability for suicide (Van Orden et al., 2010). The absence of a significant path between these two constructs suggests that if there is any relationship between them, it is likely mediated by other factors. For example, because the presence of past childhood abuse was not specifically assessed for in this study it remains possible that an indirect relationship between attachment anxiety and the acquired capability for suicide could be mediated by an individual's history of childhood abuse (van Ijzendoorn et al., 1999; Van Orden et al., 2010). Further, these results provide evidence in support of the idea that attachment anxiety is related strictly to the more interpersonally focused constructs of the interpersonal-psychological theory of suicide (i.e., perceived burdensomeness and thwarted belongingness; Joiner, 2005).

In addition to the direct effects described above, the results show an indirect effect of attachment anxiety on self-reported suicide risk ( $r = .299$ ). Based on a review of both the respecified primary a priori model and the respecified alternative a priori model, the relationship between these constructs appears to be partially mediated by the constructs of the interpersonal-psychological theory of suicide. The presence of a partial mediation effect between these constructs may help explain the inconsistent evidence regarding the relationship between attachment anxiety and suicide risk in the existing literature (e.g., Grunebaum et al., 2010). That is, if the effect of attachment anxiety on suicide risk is mediated, even partially, by constructs of the interpersonal-psychological theory of suicide (Joiner, 2005), researchers seeking to examine only the link between attachment and suicide risk would be more likely to find conflicting results; at times showing a

positive relationship (Gormley & McNiel, 2009) and at other times showing a negative relationship (Grunebaum et al., 2010).

### **Attachment Avoidance**

As with attachment anxiety, the final respecified model (see Figure 7) showed significant direct relationships between attachment avoidance and both perceived burdensomeness and thwarted belongingness. However, contrary to initial hypotheses the direction of this relationship was positive, not negative. While this finding is consistent with some prior research showing, for example, a positive link between attachment avoidance and loneliness, one aspect of thwarted belongingness (Pereira et al., 2013), it does seem somewhat counterintuitive when looked at through a strictly theoretical lens. That is to say, attachment theory (Bowlby, 1969) suggests that individuals high in attachment avoidance tend to feel uncomfortable in close relationships (Brennan et al., 1998). As a result, such individuals could theoretically be less likely to experience the aversive emotions that accompany feelings of loneliness and liability or a lack of reciprocal caring relationships (Van Orden et al., 2010). In the absence of these aversive emotions, it would be reasonable to assume within the context of the interpersonal-psychological theory of suicide (Joiner, 2005) that the impact of heightened levels of perceived burdensomeness and thwarted belongingness would be reduced or, perhaps, eliminated, leading to attachment avoidance playing a more protective role with regards to suicide risk. The results, however, do not support such a conclusion. Overall, the results show that insecure attachment, however it may present, is associated with increased levels of perceived burdensomeness and thwarted belongingness. The failure to accurately hypothesize this relationship is most likely related to the relative dearth of

research examining suicide-related constructs through an attachment lens (Mikulincer & Shaver, 2007) leading to a lack of consensus among researchers in understanding interrelationships between these constructs (c.f., Grunebaum et al., 2010; Lizardi et al., 2011).

Also in line with findings related to attachment anxiety, the results did not support the presence of a significant direct effect of attachment avoidance on the acquired capability for suicide. The reason for the lack of such an effect is likely to be similar to that described above. That is, as with attachment anxiety, this hypothesized relationship was based on theoretical links between childhood abuse and both attachment avoidance and the acquired capability for suicide (Van Orden et al., 2010). While research has consistently shown that childhood abuse is related to insecure attachment (van Ijzendoorn et al., 1999), the relationship between attachment avoidance and the acquired capability for suicide was both completely theoretical and indirect in nature, relying on the presence of a history of childhood abuse (Van Orden et al., 2010) to influence both variables. While childhood abuse is common among individuals with heightened levels of attachment anxiety and attachment avoidance (Baer & Martinez, 2006), many other constructs have also been linked to insecure attachment styles including, for example, a lack of parental responsiveness (Ainsworth, 1973). The lack of any significant findings here does not, in and of itself, bring the theoretical relationship between childhood abuse and the acquired capability for suicide into question as the construct of childhood abuse was not directly assessed in this study. Instead, it suggests that if a relationship between attachment avoidance and acquired capability for suicide does exist it is likely to be

mediated by some other construct (e.g., a history of childhood abuse). This is an area future researchers may wish to investigate.

Finally, results also showed a significant indirect effect between attachment avoidance and self-reported suicide risk ( $r = .101$ ) through the mediating variables of perceived burdensomeness, thwarted belongingness, and the acquired capability of suicide. Though this effect was smaller than the indirect effect between attachment anxiety and self-reported suicide risk ( $r = .299$ ), it nonetheless provides additional support for a positive relationship between attachment avoidance and suicide risk (Grunebaum et al., 2010; Lizardi et al., 2011). In addition, unlike with attachment anxiety, an examination of the respecified alternative a priori model (see Figure 8) suggests that the relationship between attachment avoidance and suicide risk is fully mediated by the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) as the direct relationship between thwarted belongingness and suicide risk is not significant in the alternative model (Kline, 2011). Overall, these results are consistent with the existing pool of evidence showing a link between insecure attachment styles (i.e., heightened levels of attachment anxiety, attachment avoidance, or both; Brennan et al., 1998) and increased risk for death by suicide (Adam et al., 1996; Lessard & Moretti, 1998; Violato & Arato, 2004).

### **The Interpersonal-Psychological Theory of Suicide**

All three of the constructs of the interpersonal-psychological theory of suicide showed direct positive effects on self-reported suicide risk (see Table 4). More specifically, the results showed a large ( $r = .610$ ; Cohen, 1992), direct, positive relationship between perceived burdensomeness and self-reported suicide risk. This is

consistent with prior research showing an association between perceived burdensomeness and increased risk for suicide among various populations including adult outpatients (Van Orden et al., 2006), military personnel (Bryan, Ray-Sannerud, et al., 2013), veterans (Pfeiffer et al., 2014), and undergraduate students (Van Orden et al., 2012). Within the context of the current study, the construct of perceived burdensomeness had the largest effect on suicide risk. This suggests that of the three constructs of the interpersonal-psychological theory of suicide (i.e., perceived burdensomeness, thwarted belongingness, and acquired capability for suicide; Joiner, 2005), perceived burdensomeness could play the largest role in the development of suicide risk among undergraduate college students.

A smaller ( $r = .125$ ; Cohen, 1992), but still significant, positive effect of thwarted belongingness on self-reported suicide risk was also evident. This link, too, is consistent with prior research showing that higher levels of thwarted belongingness have been associated with increased risk for suicide among a community cohort (Christensen et al., 2013), adult outpatients (Hawkins et al., 2014), military personnel (Bryan, Hernandez, et al., 2013), and undergraduate students (Van Orden et al., 2012). Together, these effects between both perceived burdensomeness and suicide risk and thwarted belongingness and suicide risk provide support for the role of the interpersonal constructs of the interpersonal-psychological theory of suicide in the development of increased suicidality (Joiner, 2005).

In addition to these two direct effects, in respecifying the final model (see Figure 7), it was necessary to add a covariance between the constructs of perceived burdensomeness and thwarted belongingness. The addition of this covariance suggests that the variables in question are being influenced by an unmeasured common cause.

(Kline, 2011), meaning that some of their variance is likely explained by some other factor that is not included in this study. This conclusion is consistent with recent evidence that has raised questions about the exact relationship between perceived burdensomeness and thwarted belongingness and hypothesized the presence of other moderating factors (Cero et al., 2015) in their development. For example, the presence of hopelessness as a potential moderating factor has been proposed (Cero et al., 2015) and would be consistent with predictions of the interpersonal-psychological theory of suicide (Van Orden et al., 2010). Other potential moderating or mediating factors may include such constructs as cultural background, resilience, or a history of psychological trauma. Overall, this suggests that while attachment constructs appear to play an important role in the development of perceived burdensomeness and thwarted belongingness, additional constructs that may play a similar role remain as yet unidentified.

The final construct of the interpersonal-psychological theory of suicide (Joiner, 2005), the acquired capability for suicide, also showed a small, positive, direct effect on self-reported suicide risk. As with other results, these findings are consistent with prior research showing similar links among adult outpatients (Smith et al., 2010; Van Orden, Witte, Gordon, et al., 2008) and military personnel (Bryan et al., 2012). This appears, however, to be the first study to suggest that this relationship between acquired capability for suicide and self-reported suicide risk also exists among an undergraduate sample.

### **Full Model Interpretation**

The overall results of the present study as shown in the final respecified model (see Figure 7) provide additional support for the interpersonal-psychological theory of suicide's (Joiner, 2005) hypotheses regarding the role of perceived burdensomeness,

thwarted belongingness, and the acquired capability for suicide in the development of increased suicide risk. Paths between the constructs of the interpersonal-psychological theory of suicide and self-reported suicide risk were all significant; however, the effect of perceived burdensomeness on suicide risk was large (Cohen, 1992) while the effects of both thwarted belongingness and the acquired capability suicide on suicide risk were small (Cohen, 1992) in nature. This suggests that perceived burdensomeness may be the most important construct of the interpersonal-psychological theory of suicide with regards to predicting or intervening in suicide related behaviors. These results are consistent with prior research that has consistently shown stronger relationships between perceived burdensomeness and self-reported suicidality than between thwarted belongingness and self-reported suicidality (Bryan et al., 2012; Cukrowicz, Cheavens, Van Orden, Ragain, & Cook, 2011; Jahn & Cukrowicz, 2011; Van Orden, Witte, Gordon, et al., 2008).

Both attachment anxiety and attachment avoidance had significant direct effects on perceived burdensomeness and thwarted belongingness. Attachment anxiety showed a larger effect on perceived burdensomeness ( $r = .432$ ) than on thwarted belongingness ( $r = .286$ ). This discrepancy may be best explained by evidence suggesting that individuals high in attachment anxiety are more insecure in their relationships and attend more readily to negative interpersonal interactions than do their less anxiously attached peers (Shaver & Mikulincer, 2014). As a result, they would likely be more susceptible to perceptions of burdensomeness in interpersonal interactions. In contrast, attachment avoidance had a larger effect on thwarted belongingness ( $r = .298$ ) than it did on perceived burdensomeness ( $r = .102$ ). While the exact reason for this difference is not



entirely clear, research has shown that individuals high in attachment avoidance also experience increased degrees of loneliness (Givertz et al., 2013) while similar research linking attachment avoidance to perceived burdensomeness either directly or indirectly could not be located.

Paths between attachment constructs and the acquired capability for suicide were not significant. This suggests that attachment anxiety and avoidance are related strictly to the interpersonally-focused constructs of the interpersonal-psychological theory of suicide (i.e., perceived burdensomeness and thwarted belongingness; Joiner, 2005) and that the development of acquired capability for suicide is either unrelated or, perhaps, indirectly related to attachment-related processes. While the presence of significant effects between attachment constructs and the acquired capability for suicide were initially hypothesized, these hypotheses were based on the theoretical presence of an indirect relationship between the constructs in question. This indirect relationship relied upon evidence and theoretical predictions suggesting that insecure attachment styles (i.e., those high in attachment anxiety, attachment avoidance, or both; Baer & Martinez, 2006) and the acquired capability for suicide (Van Orden et al., 2010) are both related to experiences of childhood abuse. While the choice not to directly assess for a history of childhood abuse in designing this study precludes drawing conclusions in support of this hypothesis (i.e., that attachment anxiety and attachment avoidance are indirectly related to the acquired capability for suicide), the presence of a mediated relationship between these constructs cannot be ruled out either.

Although attachment constructs were also positively related to self-reported suicide risk, the results suggest that the relationship between these constructs is indirect

in nature and mediated at least in part by the constructs of the interpersonal-psychological theory of suicide, providing partial support for initial hypotheses. The mediated nature of these relationships may help explain the contradictory evidence related to the relationship between attachment style and suicidality (e.g., Nye et al., 2009; Venta & Sharp, 2014; Violato & Arato, 2004).

Overall the final model (see Figure 7) accounted for just under 50% of the variance in self-reported suicide risk. This large overall effect (Cohen, 1992) suggests that both attachment styles and the constructs of the interpersonal-psychological theory of suicide are important factors to examine in working with potentially suicidal individuals. The practical implications of these findings are discussed below.

### **Theoretical Implications**

The present study's results are consistent with the tenets of Bowlby's (1969) attachment theory, which predicts that styles of attachment have broad effects on individuals' functioning. Given attachment theory's emphasis on social interactions and interpersonal style (Bowlby, 1969, 1973, 1977), these results showing a direct relationship between attachment constructs and several constructs of the interpersonal-psychological theory of suicide are in some ways unsurprising. Both perceived burdensomeness, with its emphasis on self-hate and the feeling that one is a liability to important others in one's life (Van Orden et al., 2010), and thwarted belongingness, with its emphasis on loneliness and the lack of reciprocal caring relationships (Van Orden et al., 2010), are inherently interpersonal constructs (Joiner, 2005) based on individuals' perceptions of how they are viewed by others. Attachment anxiety in particular has been consistently linked to similarly interpersonal constructs such as feelings of

burdensomeness (Kowal et al., 2012), loneliness (Givertz et al., 2013) and low self-esteem (Arbona & Power, 2003; Lee & Hankin, 2009; J. E. Roberts et al., 1996), a primary component of self-hate. Attachment avoidance, on the other hand, has been less thoroughly studied in the context of the constructs of perceived burdensomeness and thwarted belongingness. One prior study has shown a link between attachment avoidance and feelings of loneliness (Givertz et al., 2013) which is consistent with this study's results. While findings in this study regarding the relationship between attachment avoidance, perceived burdensomeness, and thwarted belongingness are inconsistent with initial hypotheses, the hypothesized effects were based solely on a theoretical understanding of attachment avoidance as leading to feelings of discomfort in close relationships (Brennan et al., 1998) which was presumed to decrease the likelihood that an individual would experience the aversive emotions that accompany feelings of perceived burdensomeness and thwarted belongingness (Van Orden et al., 2010). Results indicate that this hypothesis was incorrect and instead support the important role of both attachment anxiety and attachment avoidance in influencing the interpersonal constructs of perceived burdensomeness and thwarted belongingness.

Overall, these findings lend support to the importance of internal working models (Bowlby, 1969) in understanding the ways that individuals relate to the world. Both theory and evidence suggest that attachment styles, and the internal working models that define them, have a strong impact on the ways that individuals attend to and interpret their interactions with others with insecurely attached individuals showing a stronger tendency towards more negative interpersonal interpretations (Shaver & Mikulincer, 2014; Silva, Soares, & Esteves, 2012). This is consistent with the results of this study

showing an increase in perceptions of burdensomeness and lack of belonging, both interpersonal constructs with a negative valence, among individuals high in attachment anxiety, attachment avoidance, or both.

In addition, results showing evidence of a fully mediated indirect effect of attachment avoidance on self-reported suicide risk and a partially mediated indirect effect of attachment anxiety on self-reported suicide risk provide additional evidence in support of the importance of attachment constructs in various aspects of functioning across the lifespan (Fraley, 2002; Mikulincer & Shaver, 2007; Shaver & Mikulincer, 2014). The presence of these indirect effects provides a means within which to conceptualize the contradictory evidence describing the link between attachment style and suicide risk. Prior research has suggested that insecure attachment is both positively (Adam et al., 1996; Violato & Arato, 2004) and negatively (Nye et al., 2009; Venta & Sharp, 2014) related to suicide risk among various populations. By showing evidence that this relationship is actually mediated by other constructs, the present study provides an explanation for these inconsistent results.

Joiner's (2005) interpersonal-psychological theory of suicide predicts that interpersonal constructs play a large role in the development of suicidal ideation and other suicide-related behaviors. This study's findings provide support for Joiner's (2005) theory by showing that attachment theory's (Bowlby, 1969) inherently interpersonal constructs have significant effects on both perceived burdensomeness and thwarted belongingness. The interpersonal-psychological theory of suicide (Joiner, 2005) also hypothesizes that the constructs of perceived burdensomeness, thwarted belongingness, and the acquired capability for suicide influence the development of suicidal behavior, a

prediction that is supported by the results of the present study showing significant positive effects of all three of these constructs, and perceived burdensomeness in particular, on self-reported suicide risk.

While these data point to the interpersonal-psychological theory of suicide (Joiner, 2005) as a promising theory of suicidal behavior, they also raise questions that challenge some of this theory's assertions. For example, the interpersonal-psychological theory of suicide conceptualizes perceived burdensomeness and thwarted belongingness as fully independent constructs that interact to create heightened levels of suicidal ideation (Van Orden et al., 2010). However, the addition of a covariance between these constructs in the final respecified model (see Figure 7) for this study suggests that they may share some unifying underlying cause.

### **Practice Implications**

Several implications for the practice of counseling psychology are evident in the results of this study. Counseling psychologists have a long history of working in college counseling centers across the country (Gelso, Williams, & Fretz, 2014), a tradition which has continued in recent years (Goodyear, Murdock, Lichtenberg, Koetting, & Petren, 2008). In addition, data shows that suicide is the second leading cause of death among individuals aged 15 to 24 (CDC, 2016), an age group that includes the majority of college students in the United States. In addition, issues related to diversity and social justice have been traditionally emphasized within the field of counseling psychology (Gelso et al., 2014). Research has consistently shown that individuals with certain racial (Doshi, Boudreaux, Wang, Pelletier, & Camargo, 2005) and ethnic (Blum et al., 2000) backgrounds, or who belong to specific minority groups such as the lesbian, gay,

bisexual, and transgender community (Haas et al., 2010) are at increased risk for suicide related behaviors and death by suicide. Given these emphases, it is increasingly important that counseling psychologists develop a deeper understanding of the factors that may influence suicide-related thinking and behavior.

The results of this study, showing a partially mediated indirect effect between attachment anxiety and self-reported suicide risk and a fully mediated indirect effect of attachment avoidance on self-reported suicide risk, support the importance of counseling psychologists examining clients' relational styles. Such exploration may be especially important when working with sexual minorities where attachment related experiences can influence self-acceptance and sexual identity difficulties (Mohr & Fassinger, 2003). Counseling psychologists may choose to spend additional time exploring attachment relationships in order to develop a better understanding of the impact that they have on clients' interpersonal functioning. In doing so, they may be able to simultaneously develop a richer understanding of constructs that could ultimately influence suicidal behavior. This would also allow for the implementation of attachment-focused interventions aimed at improving interpersonal functioning and supporting more effective approaches to interpersonal interactions (e.g., Kilmann, Urbaniak, & Parnell, 2006). For example, family-oriented attachment interventions have been shown to reduce suicidality among at risk adolescents (Diamond et al., 2010). While such interventions may at times be impractical in the context of college where students can live far away from their parents or other caregivers, they may serve a useful clinical role in cases where suicide risk is deemed to be more severe.

Additionally, this study's results suggest that the constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) warrant additional examination when working with clients. There is reason to believe that both perceived burdensomeness and thwarted belongingness would be amenable to direct therapeutic intervention (Joiner, Van Orden, Witte, & Rudd, 2009). By identifying students with heightened levels of burdensomeness or a felt lack of belongingness, counseling psychologists could better target interventions and ensure appropriate and effective attendance to the potential for increased risk of suicide.

For example, there is qualitative evidence to suggest that at least some students may experience burdensomeness in relation to the impact that their choice to attend college has on their parents and families (Gibbons & Shoffner, 2004). Because results of this study suggest that perceived burdensomeness has a particularly potent effect on self-reported suicide risk ( $r = .610$ ), it may be especially important for counseling psychologists to identify students who are experiencing increased feelings of burdensomeness in their practice. In addition to the clinical interview, the Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012), which uses only six items to assess perceived burdensomeness, could be one particularly efficient way of beginning such an assessment.

Thwarted belongingness, though showing a smaller effect ( $r = .125$ ) on self-reported suicide risk in this study than perceived burdensomeness did, may present an inviting target for intervention on college campuses. Increased outreach and prevention, core aspects of the counseling psychology ethos (Gelso et al., 2014), could serve as effective means of reducing loneliness among college students. For example, social

support group interventions have been shown to reduce feelings of loneliness among first-time college students (Mattanah et al., 2010). Research has also shown that college students' feelings of thwarted belongingness can fluctuate across semesters with the lowest levels evident during the summer (Van Orden, Witte, James, et al., 2008), suggesting that counseling psychologists may want to be especially attentive to such factors at certain times of the year or during certain stages of the college experience.

While the construct of acquired capability is theorized as static in nature (i.e., once it has developed it is believed to be relatively stable; Stellrecht et al., 2006), there is not yet sufficient research available to support this claim. That said, early intervention targeting behaviors that are hypothesized to influence the development of acquired capability for suicide (e.g., non-suicidal self-injury; Joiner, 2005) may be beneficial in reducing risk for future death by suicide. Prevention efforts aimed at reducing incidents of non-suicidal self-injury on college campuses (Whitlock, Eells, Cummings, & Purington, 2009) could provide one avenue through which the development of acquired capability for suicide could be mitigated or reduced. Overall, these results suggest that counseling psychologists should examine and attend to both attachment style and constructs of the interpersonal-psychological theory of suicide (Joiner, 2005) in assessing for and working to treat individuals at risk for suicide. In doing so, they may not only increase their efficiency in work with clients, but potentially save lives as well.

### **Limitations**

This study has several limitations. First, while it has received a surprising amount of empirical support since its inception, the interpersonal-psychological theory of suicide (Joiner, 2005) remains a relatively new theory. Perhaps as a result of this, there is no



prior literature directly linking the constructs of attachment anxiety and attachment avoidance to the three primary constructs of the interpersonal-psychological theory of suicide (Joiner, 2005): perceived burdensomeness, thwarted belongingness, and acquired capability for suicide. The paucity of literature examining the interrelationships between these constructs may have impacted the strength of the theoretical foundation upon which this study was designed.

Numerous factors including degree of hopelessness, degree of depression, and history of prior suicide attempts have been shown to influence suicide risk (e.g., Beck & Steer, 1989; Brenner, Hassan, & Barrios, 1999; Brown et al., 2000; Busch et al., 2003). In addition, as a result of problems such as the file drawer phenomenon, it is possible that additional factors that may influence suicide risk remain as yet unidentified in the literature, or that the importance, or lack thereof, of specific factors could not be accurately determined via a literature review. Because of the large number of such factors and the often high intercorrelations between them, it was not possible to incorporate every potential construct that may contribute to increases in suicidal ideation and suicide risk into this study. As such, there is the potential that some important factors (e.g., hopelessness, depression) may not have been included in this analysis, thereby limiting this study's utility.

This study's sample was restricted solely to undergraduate students at a medium-sized Rocky Mountain region university and was heavily skewed towards young Caucasian females early in their college career. The use of such a restricted sample necessarily presents a threat to generalizability. Specifically, the results of this study may be significantly different from the results of a similar study examining the

interrelationships between these constructs among adult, older adult, or veteran samples, or among samples that are predominantly male or composed of greater numbers of ethnic minorities. As such, any attempt to generalize from these results should be undertaken carefully.

The design of this study was cross-sectional in nature and utilized parceling procedures in the development and testing of structural models. The use of a cross-sectional design prevents the identification of causal relationships (Levin, 2006), thereby potentially limiting the applicability of the findings. Further, while the use of parceling is generally accepted within the SEM literature (Kline, 2011), some researchers have argued that the use of parcels may introduce bias into model analyses (Little et al., 2002, 2013). If such a bias was introduced through the parceling procedures utilized in this study, results may be unreliable.

In addition, because neither a priori model provided good fit for the data collected for this study, it was necessary to undertake post hoc model respecification in order to develop a well-fitting model. While such respecification is well-supported in the literature, it nonetheless increases the risk that the final respecified model developed in this study will be sample specific (Jöreskog, 1993; Kline, 2011). This presents an additional potential threat to the generalizability of these results.

Finally, the present study relied solely on the use of self-report measures in assessing the constructs in question. The reliance on this single type of measure increases the risk that this study may suffer from mono-method bias. Such bias could lead to inflation of the strength of the relationships between the variables that were measured (Spector, 2006), thereby increasing the risk of either Type I or Type II error. Further, the

reliance solely on self-report measures is specifically recommended against in conducting a thorough suicide risk assessment. Bryan and Rudd (2006) provide an up-to-date overview of recommended suicide risk assessment procedures that may be relevant for readers interested in the process of effective clinical suicide risk assessment.

### **Directions for Future Research**

The present study provides additional support for the theoretical foundations upon which it was developed, specifically strengthening already existing evidence for relationships between attachment constructs, the constructs of the interpersonal-psychological theory of suicide, and self-reported suicide risk. Future research may therefore focus on addressing the limitations inherent in this study. Studies examining the identified interrelationships among more diverse samples may be particularly useful in helping to establish the generalizability of these results. This would not only provide additional support for the underlying theories being examined, but could potentially allow for the development of more universal intervention strategies, as well.

Future research should also utilize more diverse methods for measuring the constructs examined in this study in order to address concerns related to mono-method bias. In doing so, researchers could assess suicidality using methods more in line with current recommendations related to suicide risk assessment (e.g., Bryan & Rudd, 2006) including clinical interviews. Using multiple methods of data collection (e.g., self-report, structured or semi-structured interviews, etc.) would allow not only for a more robust measurement of suicide risk, but of attachment-related constructs as well (George et al., 1985). Additionally, previous research has identified numerous other factors that can contribute to suicide risk (e.g., hopelessness and depression; Large, Sharma, Cannon,

Ryan, & Nielssen, 2011). Research that incorporates more of these factors may help to create a clearer picture of constructs that influence the development of suicide risk.

Future researchers may also want to use a longitudinal design in a prospective study examining factors that influence suicide risk. This could involve the inclusion of constructs that are relevant to both attachment theory and the interpersonal-psychological theory of suicide (e.g., valence of social attributions) or general risk factors for suicide such as hopelessness and depression in an attempt to identify causal relationships between these constructs and suicide risk. This would also allow researchers to determine whether or not these constructs show predictive validity for actual suicidal acts.

Finally, the results of this study provide potentially new avenues of research that do not simply address the present study's limitations. The addition of a covariance between perceived burdensomeness and thwarted belongingness in this study's final respecified primary model suggests that additional variance in these two constructs can be explained by an unidentified common factor (Kline, 2011). For example, researchers have suggested that hopelessness or demographic variables such as ethnicity may impact these constructs (Cero et al., 2015). Given the interpersonal nature of the constructs in question, researchers may alternatively wish to examine additional aspects of interpersonal functioning that could increase or decrease feelings of burdensomeness or lack of belonging.

### **Conclusions**

The present study resulted in the development of a well-fitting model showing the interrelationships between the attachment-related constructs of attachment anxiety and attachment avoidance, the constructs of the interpersonal-psychological theory of suicide

(Joiner, 2005), and self-reported suicide risk. As shown in the final respecified model (see Figure 7), both attachment anxiety and attachment avoidance had significant positive direct effects on the constructs of perceived burdensomeness and thwarted belongingness. In turn, both of these constructs, as well as the construct of acquired capability for suicide, showed significant positive effects on self-reported suicide risk among a sample of undergraduate college students. These results provide additional supporting evidence for the relevance of the interpersonal-psychological theory of suicide (Joiner, 2005). In addition, they add to research examining suicide from an attachment lens, an approach that is currently underrepresented in the literature (Mikulincer & Shaver, 2007). This has important theoretical, practice, and research implications for those seeking to develop a greater understanding of suicide related behaviors, especially among undergraduate college students.

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**APPENDIX A**  
**DEMOGRAPHIC QUESTIONNAIRE**

1. What is your age in years?

[Text response with check for 18 or older]

2. What is your gender?

- a. Male
- b. Female
- c. Other (Please specify)

3. Which of the following categories do you feel best describes your race or ethnicity?  
(Select all that apply):

- a. Caucasian
- b. Latino/a
- c. African American
- d. Asian
- e. Pacific Islander
- f. American Indian or Alaskan Native
- g. Other (Please specify)
- h. I prefer not to answer

4. What is your sexual orientation?

- a. Heterosexual
- b. Gay
- c. Lesbian
- d. Bisexual
- e. Asexual
- f. Other (Please specify)
- g. I prefer not to answer

5. What is your current relationship status?

- a. Single
- b. Partnered (e.g., have a boyfriend, girlfriend, or significant other)
- c. Married
- d. Separated
- e. Divorced
- f. Other (Please specify)
- g. I prefer not to answer

6. What is the marital status of your biological parents?

- a. Married
- b. Separated
- c. Divorced
- d. Never Married
- e. Unsure
- f. Other (Please specify)
- g. I prefer not to answer

7. Are you a student Veteran?
  - a. Yes, I am a student Veteran
  - b. No, I am not a student Veteran
  
8. True or False: I am currently taking medication for a psychological/psychiatric disorder (e.g., anxiety, depression, psychosis, smoking cessation, etc.).
  - a. If True: "Has your prescription changed at all in the last 3 months?"
    - i. Yes, my prescription has changed in the last 3 months.
    - ii. No, my prescription has not changed in the last 3 months.

**APPENDIX B**

**INFORMED CONSENT AND STUDY OVERVIEW  
FOR FRESHMAN SEMINAR  
COURSE STUDENTS**





## CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH

Project Title: Attachment Styles and the Interpersonal-Psychological Theory of Suicide:  
An Examination of Interrelationships

Research Team: Jason Kacmarski, MA, EdS  
Doctoral Program in Counseling Psychology  
Department of Applied Psychology & Counselor Education  
College of Education and Behavioral Sciences

Phone Number: [970.351.2828](tel:970.351.2828) e-mail: [jason.kacmarski@unco.edu](mailto:jason.kacmarski@unco.edu)

Research Advisor: Stephen Wright, PhD  
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I am researching the interrelationships between how an individual relates to romantic partners, feelings of burdensomeness and lack of belonging, fearlessness and pain tolerance, and suicide risk among college students. I believe that by better understanding the connections and distinctions between these mental health concerns, I will better enable others in the helping professions to provide effective and appropriate treatments and other services to students across the country.

Participation in this study should take about 20 to 30 minutes of your time and will involve completing an online survey consisting of questions concerning various mental health related topics including feelings and behaviors related to romantic relationships, feelings of lack of belonging, feelings of burdensomeness, fearlessness, pain tolerance, and suicide-related thoughts and behaviors. The risks associated with participation in this study are believed to be minimal. However, if you are feeling depressed or are having thoughts of suicide, I encourage you to seek assistance as soon as possible. I have included a list of mental health resources for you to contact if necessary. While some of these resources are available free of charge to students at the University of Northern Colorado, others may charge a fee for services.

Your responses will be completely anonymous. Nobody, including me, will be able to figure out how you responded. If you are at least 18-years-old, are enrolled as a student at the University of Northern Colorado, and you choose to participate, please answer each online survey item truthfully until you get to the end. If you would like a summary of the

results of the study, please send an email to [jason.kacmarski@unco.edu](mailto:jason.kacmarski@unco.edu) requesting the study results and I'll send you a summary by email when they're available.

This study has received Institutional Review Board (IRB) approval from the University of Northern Colorado.

*Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. By choosing to begin the online survey, you have given your consent to participate in this study. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-2161.*

Thank you very much for considering participating. You are encouraged to print this page for your records.

Jason Kacmarski, MA, EdS  
Doctoral Program in Counseling Psychology  
Department of Applied Psychology & Counselor Education  
College of Education and Behavioral Sciences University of Northern Colorado

**APPENDIX C**  
**RECRUITMENT EMAIL**

Dear UNC Student,

My name is Jason Kacmarski and I am a doctoral student in Counseling Psychology here at UNC. I am writing to invite you to participate in an online survey I am conducting as part of my dissertation research entitled “Attachment Styles and the Interpersonal-Psychological Theory of Suicide: An Examination of Interrelationships.” Questions on this survey will relate primarily to how you feel in romantic relationships, whether you feel like a burden on others or like you don’t have anywhere to belong, how fearless you are about death, how much pain you believe you can tolerate, and suicide-related thoughts and behaviors including information about any past suicide attempts you may have had. Participation should take between 10 and 20 minutes of your time.

All responses will be completely anonymous. Because of this, I will not be able to follow up with or get in touch with people whose responses indicate that they are struggling with suicidal thoughts. While I believe fully that participating in this study would present at most minimal risk, it is possible that answering questions like those described above might bring up difficult feelings, potentially including thoughts of suicide. All participants will be provided with contact information for local and regional mental health resources and anyone who is having thoughts of suicide is strongly encouraged to utilize them.

What’s in it for you?

At the end of the survey, participants will be invited to provide their email address so that they can be entered into a drawing for one of two \$25 Target gift cards. Email addresses will be entered separately from your survey responses so you do not have to worry about your email address being tied to your specific responses.

If you’d like to participate, please follow the link below, and don’t hesitate to email me at [jason.kacmarski@unco.edu](mailto:jason.kacmarski@unco.edu) or contact me by phone at (970) 351-2828 with any questions.

Please click on the survey link below to get started now!

**APPENDIX D**

**LIST OF LOCAL AND NATIONAL MENTAL  
HEALTH/SUICIDE RESOURCES**

Remembering and describing thoughts or feelings related to suicide affects all of us differently. If you feel that you would like to talk to someone further about these experiences, below is a list of national and local resources for you to contact.

## **National Resources**

**National Suicide Prevention Lifeline 1-800-273-TALK (8255):** Suicide hotline, 24/7 free and confidential, nationwide network of crisis centers.

\*The National Suicide Prevention Lifeline is always free of charge

### **NAMI: 1-800-950-6264**

NAMI is the National Alliance on Mental Illness, the nation's largest grassroots organization for people with mental illness and their families. NAMI's Web Site ([www.nami.org](http://www.nami.org)) receives over 5.4 million visitors a year who turn to NAMI for information, referral, and education.

## **Campus Resources**

### **University of Northern Colorado Counseling Center: 970-951-2496**

The UNC Counseling Center is located on the 2nd floor of Cassidy Hall on the UNC Campus.

- Physical Address: 1901 10th Ave, Greeley, CO 80639
- Phone: 970-351-2496
- Fax: 970-351-1485

\*The University of Northern Colorado Counseling Center is free of charge for currently enrolled University of Northern Colorado students.

### **Psychological Services Clinic at UNC: 970-351-1645**

The UNC Psychological Services Clinic is located on the 2nd floor of McKee Hall on the UNC Campus.

Contact the clinic at (970) 351-1645 to complete a brief telephone intake. After basic information is collected the client will be assigned to a supervising faculty member who will then match the client to the appropriate counselor.

- By Phone: (970) 351-1645
- Or: Come to the counselor training programs' main office located in McKee Hall room 248 and ask for a referral form and we will contact you.

\* The Psychological Services Clinic provides services on a sliding fee scale with only the first session being offered free of charge and a fee incurred for any additional sessions.

## **Local Resources**

### **North Range Behavioral Health Emergency Line: 970-347-2120**

\*North Range Behavioral Health's Emergency Line may be used free of charge. Additional services through North Range Behavioral Health are likely to carry a fee.

**Metro Crisis Line: 1-888-885-1222.**

Free, confidential guidance and support is only a phone call away. If you're considering killing yourself, please call **888-885-1222** right now. A caring, experienced mental health professional will answer. We can help you find other options.

\*Metro Crisis Line is always free of charge

**APPENDIX E**  
**INSTITUTIONAL REVIEW BOARD (IRB)**  
**APPROVAL LETTER**



UNIVERSITY of  
NORTHERN COLORADO



*Institutional Review Board*

DATE: November 24, 2014

TO: Jason Kacmarski, MA, EdS  
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [669879-2] Attachment Styles and the Interpersonal Theory of Suicide: An Examination of Interrelationships  
SUBMISSION TYPE: Response/Follow-Up

ACTION: APPROVED  
APPROVAL DATE: November 20, 2014  
EXPIRATION DATE: November 20, 2015  
REVIEW TYPE: Expedited Review

Thank you for your submission of Response/Follow-Up materials for this project. The University of Northern Colorado (UNCO) IRB has APPROVED your submission. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on applicable federal regulations.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of November 20, 2015.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact Sherry May at 970-351-1910 or [Sherry.May@unco.edu](mailto:Sherry.May@unco.edu). Please include your project title and reference number in all correspondence with this committee.

**APPENDIX F**  
**MANUSCRIPT SUMMARY**

Attachment Styles, the Interpersonal-Psychological Theory of Suicide, and Self-Reported

Suicide Risk: A Structural Examination

Jason A. Kacmarski and Stephen L. Wright

University of Northern Colorado

### Abstract

The present study investigated the interrelationships between attachment styles, constructs of the interpersonal-psychological theory of suicide, and self-reported suicide risk among a sample of undergraduate college students ( $N = 435$ ). Structural equation modeling was utilized in order to develop a well-fitting model based on collected data. Results showed that attachment anxiety and attachment avoidance were positively associated with higher levels of perceived burdensomeness and thwarted belongingness, but not the acquired capability of suicide. In turn, perceived burdensomeness, thwarted belongingness, and the acquired capability for suicide were positively associated with higher levels of self-reported suicide risk. Bootstrapping analysis found the indirect relationship between attachment anxiety and self-reported suicide risk was partially mediated by the constructs of the interpersonal theory of suicide and the indirect relationship between attachment avoidance and self-reported suicide risk was fully mediated by the constructs of the interpersonal theory of suicide. These results suggest that the assessment of attachment styles and the constructs of the interpersonal theory of suicide may play an important role in evaluating and understanding suicide risk among college students.

*Keywords:* attachment, interpersonal-psychological theory, suicide risk, college students

Attachment Styles, the Interpersonal-Psychological Theory of Suicide, and Self-Reported Suicide Risk: A Structural Examination

Over the past decade, researchers have noted an increase in the rate of suicide among various groups around the world. Overall, more than 42,000 Americans died by suicide in the year 2014 (CDC, 2016) and over 800,000 individuals die by suicide worldwide each year (World Health Organization, 2014). Further, data show that suicide is the second leading cause of death among individuals aged 15 to 24 (CDC, 2016) in the United States, an age group that includes the majority of college students. Prevention efforts have long been a core aspect of the work of counseling psychologists (Gelso, Williams, & Fretz, 2014) and researchers have specifically called for an increased role for counseling psychologists in the study and implementation of issues related to suicide prevention and intervention (Rogers & Benson, 2013).

In spite of the prevalence of suicide and suicide-related behaviors in the United States and around the globe, researchers know relatively little about the mechanisms that underlie suicidal behavior. While several theories of suicide have been proposed over the years (Shneidman, 1993; Williams, 1997), these theories have shown difficulty in attempting to differentiate individuals who contemplate suicide from those who undertake suicide attempts or die by suicide (Klonsky & May, 2013). In order to address this shortcoming and support the development of prevention efforts, new research is needed to find and better understand factors that influence suicidal behaviors to help better identify and intervene with individuals who are at increased risk for death by suicide.

### **Attachment and Suicide-Related Behaviors**

Bowlby's (1969) attachment theory describes the ways in which early parent-child relationships can have a lasting impact on both an individual's style of relating to others and various personality characteristics that an individual may develop. Specifically, attachment theory posits that early parent-child interactions lead to the development of internal working models of the self in relation to others and to the world as a whole (Bowlby, 1969). Once developed, these internal working models serve as a lens through which an individual engages with the world. Ideas related to trusting others, the safety of the world in general, and one's own self-concept are all filtered through this lens leading individuals to develop prototypical methods of responding to events in their lives.

In applying attachment theory, researchers have sought to develop means of classifying individuals based on the ways in which they interact with the world around them. While various classification systems have been developed over the years (Ainsworth, Blehar, Waters, & Wall, 1978; Bartholomew & Horowitz, 1991), recent research has focused on Brennan, Clark, and Shaver's (1998) model which conceptualizes attachment based on two orthogonal factors: attachment anxiety and attachment avoidance. Within this model, attachment anxiety is conceptualized as fear of interpersonal abandonment by those with whom one has close relationships and attachment avoidance as discomfort related to being in close relationships with others. Individuals low in both attachment anxiety and attachment avoidance are described as securely attached while those high in one or both of these traits are described as insecurely attached (Brennan et al., 1998).

In spite of the wide ranging impact of attachment style on individuals' psychological and personality functioning (Nofhle & Shaver, 2006), relatively little research has attempted to examine suicide through an attachment-focused lens (Mikulincer & Shaver, 2007). The research that does exist has shown contradictory findings. For example, while the majority of studies examining the potential link between high levels of attachment anxiety and suicide risk or suicide-related behaviors have found a positive relationship between these constructs (e.g., Gormley & McNiel, 2009; Lizardi et al., 2011), at least one study has shown opposite results (Grunebaum et al., 2010).

Among the sparse literature examining the potential relationship between attachment avoidance and suicide-related constructs, findings have been even less consistent. Some researchers have found positive relationships between attachment avoidance and suicide-related thoughts or behaviors (Grunebaum et al., 2010) while others have found negative relationships between these constructs (Adam, Sheldon-Keller, & West, 1996; Lessard & Moretti, 1998), potentially suggesting that attachment avoidance could play a protective role with regards to suicide risk. The reasons for these inconsistent findings are not clear, as no research to date appears to have attempted to explain them.

### **The Interpersonal-Psychological Theory of Suicide**

The interpersonal-psychological theory of suicide (IPTs; Joiner, 2005) posits that three constructs are primarily responsible for the development suicide-related behaviors and risk: perceived burdensomeness (PB), thwarted belongingness (TB), and the acquired capability for suicide (ACS). According to IPTs, PB and TB are hypothesized to be related to the development of suicidal ideation (Joiner, Van Orden, Witte, & Rudd, 2009).

In contrast, ACS is described as necessary for the progression from thoughts of suicide to engagement in a suicidal act (Joiner, 2005). It is the inclusion of ACS in IPTS that sets this theory apart from prior theories of suicide which have failed to adequately differentiate those who contemplate suicide from those who attempt or die by suicide. In spite of its relative newness, the tenets of IPTS have received a large amount of support among a wide range of populations.

Within IPTS, PB is conceptualized as the perception of the self as so flawed as to be a liability on others in one's life and is comprised of feelings of liability and self-hate (Van Orden et al., 2010). Individuals who are experiencing high levels of PB may feel that the important others in their lives would be better off if they were no longer around. Research has so far supported the presence of a link between higher levels of PB and suicide-related factors. For example, PB has been found to have a positive relationship with suicidal ideation among various populations including adult outpatients (Van Orden, Lynam, Hollar, & Joiner, 2006), older adults (Jahn & Cukrowicz, 2011), active duty military personnel (Bryan, Morrow, Anestis, & Joiner, 2010), veterans (Pfeiffer et al., 2014), and undergraduate college students (Van Orden, Cukrowicz, Witte, & Joiner, 2012).

TB can be conceptualized as a felt lack of belonging and is comprised of feelings of loneliness and a lack of reciprocal caring relationships (Van Orden et al., 2010). Similar to PB, research has consistently supported a link between TB, and suicide-related thoughts. Positive relationships between TB and suicidal ideation have been demonstrated across a broad range of populations including outpatient adults (Hawkins et al., 2014), a large international community sample (Christensen, Batterham, Soubelet, &



Mackinnon, 2013), active duty military personnel (Bryan, Hernandez, Allison, & Clemans, 2013), and undergraduates (Van Orden et al., 2012).

ACS has been described as the ability to overcome the fear and expectation of pain related to engaging in a suicidal act and is comprised of both increased pain tolerance and reduced fear of death (Van Orden et al., 2010). The development of increased pain tolerance and fearlessness about death are believed to come about through the process of habituation (Joiner, Van Orden, Witte, Selby, et al., 2009) in which repeated exposure to a stimulus leads to a decrease in the intensity of any response to that stimulus (Groves & Thompson, 1970). Research has consistently supported this assertion. For example, higher levels of ACS have been linked to numerous painful and fear-inducing experiences including a history of prior suicide attempts (Brown, Beck, Steer, & Grisham, 2000) and combat exposure (Bryan, Cukrowicz, West, & Morrow, 2010). Further, exposure to both more frequent combat (Bryan et al., 2013) and more violence within combat (Bryan & Cukrowicz, 2011) have been linked to higher levels of ACS among military personnel. Research has also shown that levels of ACS are higher among suicide attempters than among those who only think about suicide (Smith, Cukrowicz, Poindexter, Hobson, & Cohen, 2010). This finding lends credence to the IPTS's assertion that ACS differentiates those who think about suicide from those who actually attempt to die by suicide. Finally, investigators have posited the existence of additional pathways to the development of ACS including exposure to childhood maltreatment (Van Orden et al., 2010), though no research to date has assessed such a relationship.

## Theoretical Model

A significant amount of existing research supports the role of constructs of IPTS in the development of suicide-related thoughts and behaviors. However, factors that influence the development of PB and TB remain largely unexplored. Attachment theory (Bowlby, 1969) provides a potential framework through which the development of the IPTS's constructs can be examined. Given evidence that individuals high in attachment anxiety in particular attend more closely to negative emotional cues than to positive ones (Shaver & Mikulincer, 2014), there is reason to believe that attachment constructs may play a particularly potent role in the development of PB and TB, both of which rely on an individual's interpretation of their interpersonal experience (Joiner, 2005). In addition, while not an overtly interpersonal construct, researchers have suggested that early childhood experiences including childhood abuse or maltreatment may influence the development of both insecure attachment styles (Baer & Martinez, 2006) and ACS (Van Orden et al., 2010).

Though these theories have never been examined in tandem, indirect evidence suggests that they are likely to be related. Individuals high in attachment anxiety have been shown to experience lower levels of self-esteem (Lee & Hankin, 2009), a component of PB (Van Orden et al., 2010), and to be more likely to experience themselves as a burden on others (Kowal, Wilson, McWilliams, Péloquin, & Duong, 2012). Research has also indicated that these individuals experience heightened levels of loneliness (Pereira, Taysi, Orcan, & Fincham, 2013). Findings related to attachment avoidance, on the other hand, have been less consistent. While there is evidence to suggest that more avoidantly attached individuals experience lower levels of self-esteem

(Arbona & Power, 2003) and show a desire for belongingness (MacDonald & Borsook, 2010) when examined experimentally, research has also shown that they may, in fact, experience lower levels of burdensomeness (Kowal et al., 2012) and loneliness (Berlin, Cassidy, & Belsky, 1995) than their more anxiously attached peers. There is currently no research we were able to identify examining the inconsistency of findings regarding attachment avoidance.

### **Purpose of the Study**

Researchers have lamented the dearth of literature examining suicide-related behaviors from an attachment perspective (Mikulincer & Shaver, 2007) while research investigating the development of PB and TB, two of the core aspects of IPTS, is largely non-existent. Further, researchers have not yet investigated whether interpersonal factors can influence the development of ACS directly. The present study sought to address these shortcomings by examining the relationship between attachment theory, IPTS, and self-reported suicide risk. In order to do so, an a priori model of the interrelationships between these constructs was developed. Consistent with existing research, this model hypothesized direct positive effects of attachment anxiety on the constructs of PB and TB. Given inconsistent evidence regarding the potential role of attachment avoidance on suicide-related behaviors and some research suggesting that attachment avoidance may, in fact, play a protective role with regards to suicide risk (Adam et al., 1996; Lessard & Moretti, 1998), this model hypothesized direct negative effects between attachment avoidance and the constructs of PB and TB. In addition, consistent with theory suggesting the potential for an indirect relationship between insecure attachment styles and the ACS, both attachment anxiety and attachment avoidance were hypothesized to

have direct positive effects on ACS and to have indirect positive effects on self-reported suicide risk through the mediating constructs of IPTS. Finally, all three of the constructs of the interpersonal theory of suicide were hypothesized to have direct positive effects on suicide risk.

Consistent with best practices in structural equation modeling (SEM; Kline, 2011), an alternative a priori model of the interrelationships between these constructs was also created. Because the literature examining the link between suicide risk and attachment constructs remains sparse (Mikulincer & Shaver, 2007), it was not possible to fully rule out the presence of a direct link between attachment constructs and self-reported suicide risk in designing this study. As such, the alternative a priori model maintained all of the previously described effects and added direct paths between attachment constructs (i.e., attachment anxiety and attachment avoidance) and self-reported suicide risk.

## **Method**

### **Participants and Procedures**

After receiving institutional review board approval for this study, participants were recruited from a medium-sized Rocky Mountain region university via three methods: from an introductory undergraduate course in which students were offered extra credit for their participation, from undergraduate psychology courses in which students received course credit for participating in research studies, and via email. Potential participants were directed to an anonymous online survey where they provided informed consent to participate. With the exception of a demographic questionnaire, all instruments were administered in a randomized order to control for any order effects. A total of 495

individuals began and completed at least some portion of the survey. Of these 495 potential participants, 60 individuals fully omitted at least one of the measures and were removed from the analysis resulting in a remaining sample of 435 undergraduate participants.

The final sample of participants ( $N=435$ ) were between the ages of 18 and 23 ( $M = 18.73$ ,  $SD = 1.07$ ). In addition, 70.1% identified as women and 0.5% chose not to provide an identified gender. With regards to the ethnic composition of participants: 60.0% identified as Caucasian, 17.2% as Hispanic, 11.7% as multi-ethnic, 7.8% as African American, 2.1% as other, and 1.2% as Asian or Asian American.

### **Instruments**

**Attachment.** The latent variables of attachment anxiety and attachment avoidance were measured using the Experiences in Close Relationships-Revised (ECR-R; Fraley, Waller, & Brennan, 2000). The ECR-R consists of 36 items divided into two subscales: an 18-item attachment anxiety subscale and an 18-item attachment avoidance subscale. On the ECR-R, respondents are asked to rate their level of agreement with various statements on a 7-point Likert-type scale with responses ranging from 1 (“*Strongly disagree*”) to 7 (“*Strongly agree*”). Items on the attachment anxiety subscale of the ECR-R are focused on experiences of fear, worry, and uncertainty in relationships with others. Higher scores on this subscale indicate higher levels of attachment anxiety. Internal consistency reliability for the attachment anxiety subscale scores in the present study was excellent ( $\alpha = .94$ ). Items on the avoidance subscale of the ECR-R are related to feelings of comfort, or lack thereof, with emotional proximity to a partner. Higher scores on this subscale indicate higher levels of attachment avoidance. The internal consistency

reliability for the attachment avoidance subscale in the present study was also excellent ( $\alpha = .94$ ). Both subscales of the ECR-R have been found to display adequate convergent and divergent validity among an undergraduate sample (Fairchild & Finney, 2006).

**Interpersonal needs.** The latent variables of PB and TB were measured using the 15-item version of the Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012). The INQ is divided into a six-item perceived burdensomeness subscale and a nine-item thwarted belongingness subscale. Respondents are asked to rate their level of agreement with various statements on a 7-point Likert-type scale with responses ranging from 1 (“*Not at all true for me*”) to 7 (“*Very true for me*”). Items on the PB subscale of the INQ consist of statements related to feelings of burdensomeness and higher scores on this subscale indicate higher levels of PB. Internal consistency reliability for scores on the PB subscale in the present study was excellent ( $\alpha = .95$ ). Items on the TB subscale of the INQ consist of statements related to feelings of loneliness and lack of belonging and higher scores on this subscale indicate higher levels of TB. Internal consistency reliability for scores on the TB subscale in the present study was good ( $\alpha = .87$ ). Both the PB and TB subscales of the INQ have been found to display adequate convergent and divergent validity among an undergraduate sample (Van Orden et al., 2012).

**Acquired capability for suicide.** The 20-item Acquired Capability for Suicide Scale (ACSS; Van Orden, Witte, Gordon, Bender, & Joiner, 2008) was used in the present study as an operationalized measure of ACS. Respondents were asked to rate how well each statement describes them on a 5-point Likert-type scale with responses ranging from 0 (“*Not at all like me*”) to 4 (“*Very much like me*”). Items on the ACSS consist of statements related to general experiences of fear and responses to pain including. Higher

scores on the ACSS indicate higher levels of ACS. Internal consistency reliability for scores on the ACSS in the present study was good ( $\alpha = .80$ ). The ACSS has been found to display adequate convergent and divergent validity among an undergraduate sample (Anestis, Bagge, Tull, & Joiner, 2011).

**Suicide risk.** Suicide risk is a multifaceted construct that is difficult to measure accurately (Goldney, 2000). Researchers have recommend that any assessment of suicide risk include, at minimum, an assessment of suicide-related thoughts, plans, and intent (Jacobs, Brewer, & Klein-Benheim, 1999). As such, three separate measures were used to assess for self-reported suicide risk in the present study.

***Adult Suicidal Ideation Questionnaire.*** The Adult Suicidal Ideation Questionnaire (ASIQ; Reynolds, 1991) is a 25-item self-report measure of suicidal ideation. Respondents are asked to indicate the frequency with which they have certain thoughts related to suicide using a 7-point Likert-type scale that ranges from 0 (“*I never had this thought*”) to 6 (“*Almost every day*”). Higher scores on the ASIQ indicate higher degrees suicidal ideation and therefore higher self-reported suicide risk. Internal consistency reliability for scores on the ASIQ in the present study was excellent ( $\alpha = .98$ ). The ASIQ has been found to display adequate convergent and divergent validity among an undergraduate sample (Reynolds, 1991).

***Suicide Behaviors Questionnaire – Revised.*** The Suicide Behaviors Questionnaire – Revised (SBQ-R; Osman et al., 2001) is a 4-item self-report measure of various dimensions of suicidality including lifetime experiences of suicidal ideation or suicide attempts, the frequency of suicidal ideation in the last year, lifetime threat of suicide attempt, and likelihood that an individual will undertake a suicide attempt in the

future. Items on the SBQ-R have variable scoring criteria related to the number of possible responses for each item but all rely upon Likert-type scales. A total score is obtained by summing item scores and higher scores on the SBQ-R indicate higher degrees of self-reported suicide-related behaviors. Internal consistency reliability for scores on the SBQ-R in the present study was good ( $\alpha = .80$ ). The SBQ-R has been found to display adequate convergent and divergent validity among an undergraduate sample (Osman et al., 2001).

***Self-Harm Behaviors Questionnaire.*** The Self-Harm Behaviors Questionnaire (SHBQ; Gutierrez, Osman, Barrios, & Kopper, 2001) is a self-report measure of suicide and self-harm related behaviors that is divided into four sections: history of non-suicidal self-injury, history of suicide attempts, threats of suicide, and suicide ideation. Gutierrez and Osman (2008) devised a comprehensive scoring system through which responses to items on this scale are coded and summed such that “a single numerical value is derived to represent each item in carrying out statistical analyses” (Gutierrez et al., 2001, p. 477). Total scores on the SHBQ range from 0 to 78 with higher scores indicating greater degrees of self-reported suicide-related behaviors (Gutierrez & Osman, 2008). Internal consistency reliability for scores on the SHBQ in the present study was excellent ( $\alpha = .92$ ). The SHBQ has been found to display adequate convergent and divergent validity among an undergraduate samples (Gutierrez et al., 2001).

## **Results**

### **Preliminary Analyses**

A missing values analysis revealed a total of 15 missing values affecting 14 different items and 11 different participants among this study’s 435 participants.



Researchers have recommended against the use of listwise deletion strategies for addressing missing data; as such, a stochastic imputation method using a maximum likelihood approach (i.e., expectation-maximization strategy) was utilized to impute missing data points (Schlomer, Bauman, & Card, 2010). This process consisted of two steps: an expectation step in which a linear regression model was created based on parameter estimates calculated from existing data and used to impute missing values and a maximization step in which new parameter estimates were calculated based on both the original data and the newly imputed values. These steps were cycled through repeatedly using the new parameter estimates derived in the maximization step until convergence was reached.

Data screening procedures revealed no concerns related to multicollinearity. Potential outliers that were identified by calculating Mahalanobis distances for each participant were all deemed to represent valid data and were therefore not removed from the analysis. As a result, the full remaining data set was utilized for the primary analyses that follow. The assumptions of SEM were examined and results showed that that responses related to PB and the ASIQ measure of suicidal ideation were both moderately skewed and moderately leptokurtic (Curran, West, & Finch, 1996). In order to account for the moderate nonnormality in these scales, the Satorra-Bentler scaled  $\chi^2$  statistic (Satorra & Bentler, 1988), which is far more robust to nonnormality than the standard  $\chi^2$  statistic, was utilized when conducting the SEM analyses. Assumptions related to linear relationships between predictor and outcome variables, homoscedasticity, and equal relative variances were also examined and suggested no difficulties that would interfere with an accurate analysis (Kline, 2011).

Finally, data from measures assessing attachment anxiety, attachment avoidance, PB, TB, and ACS were parceled in order to create a total of three indicators for each of these latent constructs. Parceling was conducted via a balanced parceling method described by Little, Cunningham, Shahar, and Widaman (2002). Parcel values were then calculated as the mean of items included in the parcel in order to avoid any potential difficulties related to parcels containing different numbers of items (Little, Rhemtulla, Gibson, & Schoemann, 2013). Each of the three scales measuring self-reported suicide-related thoughts and behaviors were used as individual indicators for the latent factor of self-reported suicide risk. Intercorrelations and descriptive statistics for all indicators are shown in Table 1.

### **Measurement Model**

A confirmatory factor analysis (CFA) of the measurement model for the SEM analysis was completed next in order to ensure that the measurement model showed adequate fit for the data (Kline, 2011). The CFA was conducted using the maximum likelihood (ML) estimation  $\chi^2$  method and the Satorra-Bentler scaled  $\chi^2$  statistic (Satorra & Bentler, 1988) in Stata 14.1 (StataCorp, 2015). Fit was assessed using criteria recommended by Hu and Bentler (1999):  $CFI$  and  $NNFI > 0.95$ ,  $RMSEA < .06$ , and  $SRMR < .08$ . The results of this CFA showed a significant Satorra-Bentler scaled  $\chi^2$  statistic ( $\chi^2_{S-B} (120) = 223.91, p < .001$ ) suggesting inexact model fit. However, such an outcome is not uncommon when large sample sizes are utilized (Barrett, 2007). As such, model fit indices were examined and showed good overall fit for this measurement model:  $CFI_{S-B} = 0.982$ ,  $NNFI_{S-B} = 0.977$ ,  $SRMR = .039$ ,  $RMSEA_{S-B} = .045$ ,  $RMSEA = .051$

[90% CI = .042-.059]. Factor loadings for each of the indicators were statistically significant suggesting that they accurately represented the relevant latent factors.

### **Structural Model**

In order to examine the interrelationships between attachment constructs, constructs of IPTS, and self-reported suicide risk, the primary a priori model was estimated using the ML estimation method. The results of this analysis showed inadequate fit for the data:  $\chi^2_{S-B} (126) = 361.64, p < .001, CFI_{S-B} = 0.959, NNFI_{S-B} = 0.950, SRMR = .122, RMSEA_{S-B} = .066$ . The alternative a priori model which added direct paths between attachment anxiety and self-reported suicide risk and attachment avoidance and self-reported suicide risk was estimated next and also showed inadequate fit for the data:  $\chi^2_{S-B} (124) = 346.22, p < .001, CFI_{S-B} = 0.961, NNFI_{S-B} = 0.952, SRMR = .119, RMSEA_{S-B} = .064$ . Given the relatively poor fit of both a priori models and in line with Jöreskog's (1993) model generating approach to SEM, the decision was made to respecify the model in an attempt to obtain adequate fit while ensuring that the resultant model remained consistent with underlying theories (Kline, 2011) of attachment and IPTS.

In order to respecify the model, modification indices were calculated based on the results of the primary a priori model estimation. Modification indices suggested the addition of covariances between the exogenous variables of attachment anxiety and attachment avoidance and the endogenous variables of PB and TB, both of which were consistent with attachment theory and IPTS. The resultant model was estimated and showed adequate fit for the data:  $\chi^2_{S-B} (124) = 243.06, p < .001, CFI_{S-B} = 0.979, NNFI_{S-B} = 0.974, SRMR = .048, RMSEA_{S-B} = .047, RMSEA = .053, 90\% CI [.045-.062]$ . For the

sake of completeness, the same covariances were also added to the alternative a priori model. The resultant model also showed good fit for the data:  $\chi^2_{S-B}(122) = 226.95, p < .001, CFI_{S-B} = .982, NNFI_{S-B} = .977, SRMR = .043, RMSEA_{S-B} = .044, RMSEA = .050$  [90% CI = .042-.059]. The  $\chi^2$  difference statistic comparing results between the two respecified models was also significant:  $\Delta\chi^2(2) = 16.11, p < .001$ . This suggests that the respecified alternative model was a better fit for the data than the respecified primary model. However, structural models with additional paths in which other models are nested should provide a better fit for data (Kline, 2011) and the respecified alternative model was both less parsimonious (Loehlin, 2004) and had more non-significant structural parameter estimates than the respecified primary model. Therefore, the respecified primary model was chosen as the final model.

Structural path coefficients for the final model are shown in Figure 1. With the exception of paths between attachment constructs and ACS, all paths showed significant positive direct effects. Higher levels of both attachment anxiety and attachment avoidance predicted higher levels of PB and TB and higher levels of PB, TB, and ACS in turn predicted higher levels of self-reported suicide risk. The final model accounted for 23% of the variance in both PB and TB and 48.2% of the variance in self-reported suicide risk.

### **Bootstrapping Analysis**

In order to determine whether the effects of attachment constructs on self-reported suicide risk were mediated by the constructs of IPTS, a bootstrapping analysis was conducted on the final model using procedures recommended by Shrout and Bolger

(2002). This involved using Stata version 14.1 (StataCorp, 2015) to generate 1,000 bootstrap samples based on the collected data, and to use these samples to calculate a 95% confidence interval (CI) for each effect. Per recommendations, any 95% CI that did not include zero was considered to be significant at the .05 level and therefore to indicate the presence of a mediation effect (Mallinckrodt, Abraham, Wei, & Russell, 2006). Results of this analysis are shown in Table 2 and indicate that the constructs of IPTS mediated the effects of attachment constructs on self-reported suicide risk. In order to identify whether mediation was full or partial, an additional bootstrapping analysis was conducted which included direct effects between attachment constructs and self-reported suicide risk. Results shown in Table 2, showed that the direct effect of attachment avoidance, but not attachment anxiety, was non-significant in this analysis indicating that the relationship between attachment avoidance and self-reported suicide risk is fully mediated by the constructs of IPTS while the relationship between attachment anxiety and self-reported suicide risk is only partially mediated by these constructs.

### **Discussion**

Both attachment anxiety and attachment avoidance had significant direct effects on PB and TB, though contrary to initial hypotheses the effect of attachment avoidance on both PB and TB was positive in nature, not negative. While this finding is consistent with some prior research showing a positive link between attachment avoidance and loneliness, one aspect of TB (Pereira et al., 2013), it does seem somewhat counterintuitive when looked at through a strictly theoretical lens. Accordingly, attachment theory (Bowlby, 1969) suggests that individuals high in attachment avoidance tend to feel uncomfortable in close relationships (Brennan et al., 1998). As a result, such

individuals could theoretically be less likely to experience the aversive emotions that accompany feelings of loneliness and liability or a lack of reciprocal caring relationships (Van Orden et al., 2010). In the absence of these aversive emotions, it would be reasonable to assume within the context of IPTS that the impact of heightened levels of PB and TB would be reduced or eliminated. The results, however, do not support such a conclusion. Overall, the results show that insecure attachment, however it may present, increases levels of PB and TB.

Attachment anxiety showed a larger effect on PB than on TB. This discrepancy may be best explained by evidence suggesting that individuals high in attachment anxiety are more insecure in their relationships and attend more readily to negative interpersonal interactions than do their less anxiously attached peers (Shaver & Mikulincer, 2014). As a result, they would likely be more susceptible to perceptions of burdensomeness in interpersonal interactions. In contrast, attachment avoidance had a larger effect on TB than it did on PB. While the exact reason for this difference is not entirely clear and needs to be examined in the future, research has shown that individuals high in attachment avoidance also experience increased degrees of loneliness (Givertz, Woszidlo, Segrin, & Knutson, 2013). Similar research linking attachment avoidance to PB either directly or indirectly could not be located and warrants exploration.

Paths between attachment constructs and ACS were not significant. This suggests that attachment anxiety and avoidance are related strictly to the interpersonally-focused constructs of the interpersonal theory of suicide (i.e., PB and TB; Joiner, 2005) and that the development of ACS is either unrelated or, perhaps, indirectly related to attachment-related processes. While the presence of significant effects between attachment constructs

and ACS were initially hypothesized, these hypotheses were based on the theoretical presence of an indirect relationship between the constructs in question. This indirect relationship relied upon evidence and theoretical predictions suggesting that insecure attachment styles (i.e., high attachment anxiety and/or avoidance; Baer & Martinez, 2006) and ACS (Van Orden et al., 2010) are both related to experiences of childhood abuse. While the choice not to directly assess for a history of childhood abuse in designing this study precludes drawing conclusions in support of this hypothesis (i.e., that attachment anxiety and attachment avoidance are indirectly related to ACS), the presence of a mediated relationship between these constructs cannot be ruled out, either. Future research could examine the presence of such an indirect relationship by specifically assessing for a history of childhood abuse.

Although attachment constructs were also positively related to self-reported suicide risk, the results suggest that the relationship between these constructs is indirect in nature and mediated at least in part by the constructs of the interpersonal theory of suicide, providing partial support for the initial hypotheses. The mediated nature of these relationships may help explain the contradictory evidence related to the role of attachment style in the development of suicidality (e.g., Nye et al., 2009; Venta & Sharp, 2014; Violato & Arato, 2004).

The results of the present study provide additional support for the interpersonal theory of suicide's (Joiner, 2005) hypotheses regarding the role of PB, TB, and ACS in the development of increased suicide risk. Paths between the constructs of the interpersonal theory of suicide and self-reported suicide risk were all significant; however, the effect of PB on suicide risk was large while the effects of both TB and the

acquired capability suicide on suicide risk were small (Cohen, 1992) in nature. This suggests that PB may be the most important construct of the interpersonal theory of suicide with regards to predicting or intervening in suicide related behaviors. These results are consistent with prior research that has consistently shown stronger relationships between PB and self-reported suicidality than between TB and self-reported suicidality (Bryan, Clemans, & Hernandez, 2012; Jahn & Cukrowicz, 2011; Van Orden et al., 2008). Overall the final model accounted for just under 50% of the variance in self-reported suicide risk among college students. This large overall effect suggests that both attachment style and the constructs of the interpersonal theory of suicide are important factors to examine in working with potentially suicidal individuals.

### **Limitations**

This study has several limitations. Numerous factors including degree of hopelessness, degree of depression, and history of prior suicide attempts have been shown to influence suicide risk (e.g., Brown et al., 2000; Busch, Fawcett, & Jacobs, 2003). Because of the large number of such factors and the often high intercorrelations between them, it was not possible to incorporate every potential construct that may contribute to increases in self-reported suicide risk into this study. As such, there is the potential that the exclusion of some important factors (e.g, hopelessness, depression) may limit this study's utility and this is an area that could be researched further. The sample was restricted solely to undergraduate students at a medium-sized Rocky Mountain region university and was heavily skewed towards young Caucasian females early in their college career which necessarily presents a threat to generalizability. Further, the design of this study was cross-sectional in nature and utilized parceling procedures in the



development and testing of structural models. The use of a cross-sectional design prevents the identification of causal relationships (Levin, 2006), thereby potentially limiting the applicability of the findings. Future research using longitudinal methods could help address this limitation. Further, while the use of parceling is generally accepted within the SEM literature (Kline, 2011), some researchers have described how the use of parcels may introduce bias into model analyses (Little et al., 2013). If such bias was introduced through the parceling procedures utilized in this study, results may be unreliable. In addition, because neither a priori model provided good fit for the data collected for this study, it was necessary to undertake post hoc model respecification in order to develop a well-fitting model. While such respecification is well-supported in the literature, it nonetheless increases the risk that the final respecified model developed in this study will be sample specific (Jöreskog, 1993; Kline, 2011). This presents an additional potential threat to the generalizability of these results. Finally, the present study relied solely on the use of self-report measures in assessing the constructs in question. The reliance on this single type of measure increases the risk that this study may suffer from mono-method bias. Such bias could lead to inflation of the strength of the relationships between the variables that were measured (Spector, 2006), thereby increasing the risk of either Type I or Type II error.

### **Practice Implications**

The results of this study have several implications for the practice of counseling psychology. Findings support the importance of counseling psychologists examining clients' relational styles and feelings of attachment anxiety in particular. Counseling psychologists may choose to spend additional time exploring attachment relationships in

order to develop a better understanding of the impact that they may have on current interpersonal functioning. In doing so, they may be able to simultaneously develop a richer understanding of constructs that could ultimately influence potential suicidal behavior. This would also allow for the implementation of attachment-focused interventions aimed at improving interpersonal functioning (e.g., Kilmann, Urbaniak, & Parnell, 2006) and simultaneously possibly reducing suicide risk. For example, family-oriented attachment interventions have been shown to reduce suicidality among at risk adolescents (Diamond et al., 2010). While such interventions may at times be impractical in a college setting where students can live far away from their primary caregivers, they may serve a useful clinical role in cases where suicide risk is more severe.

In addition, this study's results suggest that the constructs of the interpersonal theory of suicide (Joiner, 2005) warrant additional examination when working with clients. Psychologists should therefore seek to identify interpersonal factors that may be influencing clients' functioning. There is reason to believe that both PB and TB would be amenable to direct therapeutic intervention (Joiner, Van Orden, Witte, & Rudd, 2009). By identifying individuals with heightened levels of burdensomeness or a felt lack of belongingness, counseling psychologists could better target interventions and ensure appropriate and effective attendance to the potential for increased risk of suicide. For example, there is qualitative evidence to suggest that at least some students may experience burdensomeness in relation to the impact that their choice to seek out a college degree has on their parents and families (Gibbons & Shoffner, 2004). Because results of this study suggest that PB has a particularly potent effect on self-reported suicide risk, it may be especially important for counseling psychologists to identify

students who are experiencing increased feelings of burdensomeness in their practice.

The Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012), which consists of only 15 total items, could be one particularly efficient way of beginning such an assessment.

### **Conclusions**

This study resulted in the development of a well-fitting model showing the interrelationships between the attachment-related constructs of attachment anxiety and attachment avoidance, the constructs of IPTS, and self-reported suicide risk. As shown in the final respecified model, both attachment anxiety and attachment avoidance had significant positive direct effects on the constructs of PB and TB. In turn, both of these constructs, as well as the construct of ACS, showed significant positive effects on self-reported suicide risk. These results provide additional supporting evidence for the relevance of IPTS. In addition, they add to research examining suicide from an attachment lens (Mikulincer & Shaver, 2007). This has important implications for those seeking to develop a greater understanding of suicide related behaviors.

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Table 1

*Correlations and Descriptive Statistics for All Indicators*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Mean	SD
1. ANX1	-																		3.32	1.39
2. ANX2	.832*	-																	3.50	1.46
3. ANX3	.845*	.823*	-																2.94	1.51
4. AVD1	.227*	.238*	.333*	-															3.13	1.28
5. AVD2	.233*	.235*	.342*	.892*	-														3.02	1.28
6. AVD3	.246*	.262*	.362*	.870*	.895*	-													2.92	1.27
7. PB1	.404*	.421*	.452*	.203*	.227*	.208*	-												3.59	2.65
8. PB2	.369*	.383*	.412*	.190*	.211*	.197*	.874*	-											3.12	2.24
9. PB3	.342*	.352*	.379*	.222*	.224*	.205*	.863*	.883*	-										3.20	2.33
10. TB1	.311*	.330*	.345*	.314*	.364*	.343*	.523*	.494*	.462*	-									2.54	1.35
11. TB2	.309*	.339*	.350*	.315*	.350*	.333*	.539*	.503*	.487*	.844*	-								2.71	1.47
12. TB3	.244*	.238*	.293*	.294*	.325*	.343*	.464*	.442*	.432*	.784*	.681*	-							2.41	1.37
13. ACSS1	.065	.008	.044	.011	.012	-.011	.057	.050	.064	-.015	-.018	-.004	-						2.24	0.71
14. ACSS2	.008	-.017	.032	.049	.068	.036	.104	.138*	.152*	.079	.057	.086	.537*	-					1.93	0.69
15. ACSS3	-.013	-.087	-.013	.014	.010	-.019	-.011	.021	.049	-.021	-.064	-.017	.700*	.616*	-				2.08	0.72
16. ASIQ	.338*	.366*	.359*	.195*	.180*	.174*	.592*	.583*	.596*	.358*	.400*	.336*	.111	.131*	.027	-			0.67	0.97
17. SBQ-R	.399*	.427*	.413*	.232*	.221*	.206*	.615*	.558*	.588*	.398*	.458*	.348*	.152*	.186*	.034	.673*	-		7.31	3.88
18. SHBQ	.242*	.283*	.241*	.172*	.157*	.161*	.439*	.366*	.381*	.271*	.310*	.248*	.149*	.149*	.040	.518*	.714*	-	1.93	2.92

Note. \* indicates  $p < .01$

ANX = Parcels from the ECR-R Attachment Anxiety subscale, AVD = Parcels from the ECR-R Attachment Avoidance subscale, PB = Parcels from the INQ Perceived Burdensomeness subscale, TB = Parcels from the INQ Thwarted Belongingness subscale, ACSS = Parcels from the Acquired Capability for Suicide Scale, ASIQ = Adult Suicidal Ideation Questionnaire, SBQ-R = Suicide Behaviors Questionnaire – Revised, SHBQ = Self-Harm Behavior Questionnaire.

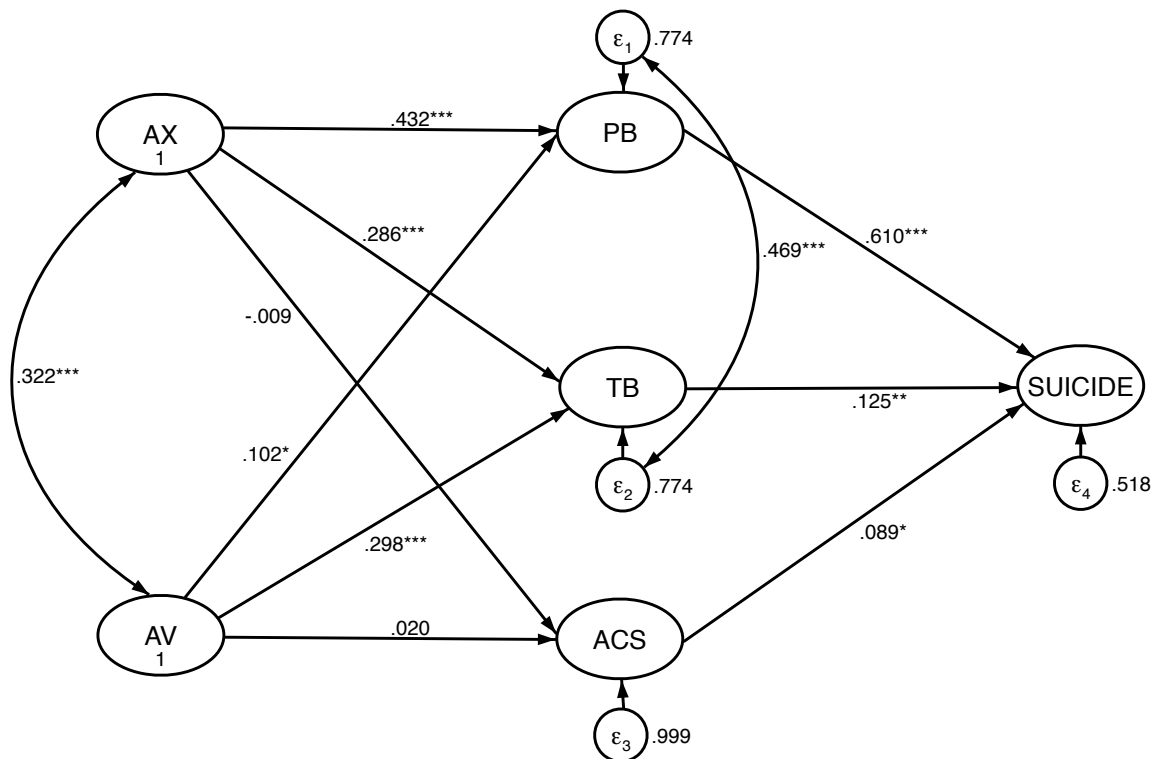
Table 2

*Bootstrap Analysis of Direct and Indirect Effects of Attachment Constructs on Suicide Risk*

Model	Independent variable	Effect type	Standardized effect ( $\beta$ )	Mean effect (b) <sup>†</sup>	SE of mean <sup>†</sup>	95% CI <sup>†</sup>
Final	Anxiety	Indirect	.299	.849	.127	[.600, 1.099]
	Avoidance	Indirect	.101	.298	.108	[.087, .509]
Alternate	Anxiety	Direct	.190	.544	.166	[.218, .870]
	Anxiety	Indirect	.249	.713	.118	[.488, .945]
	Avoidance	Direct	.026	.077	.139	[-.196, .349]
	Avoidance	Indirect	.081	.239	.100	[.042, .435]

*Note.* Final = Final model. Alternate = Final model with the addition of indirect paths between attachment constructs and self-reported suicide risk. CI = Confidence Interval.

<sup>†</sup>Indicates values based on unstandardized path coefficients. Indirect and direct effects were significant if a zero point was not included in the 95% CI.



*Figure 1.* Final model. Estimates are reported as standardized parameters. Estimates for disturbances ( $\epsilon$ ) represent the proportion of unexplained variance. AX = Attachment Anxiety, AV = Attachment Avoidance, PB = Perceived Burdensomeness, TB = Thwarted Belongingness, ACS= Acquired Capability for Suicide.  
 \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$