The Role Self-Forgiveness and Hope in Relation to the Interpersonal Psychological Theory of Suicide

Thesis

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Abstract

Suicide is the 10th leading cause of death in the United States (Centers for Disease Control, 2012), and despite decades of research, the prediction of suicide risk remains relatively imprecise. Though a large number of factors are associated with suicide, there is relatively little empirical guidance as to how to efficiently integrate this information to determine suicide risk. Joiner (2005) proposed the interpersonal-psychological theory of suicide as an approach to understanding suicidal ideation and behavior, and numerous studies have supported its theoretical and clinical utility. In the current study, the relationships among hope, self-forgiveness, and the interpersonal-psychological theory of suicide were explored. Hope moderated the relationship between thwarted belonging and suicidal ideation in younger adults, and self-forgiveness moderated the relationship between perceived burdensomeness and suicidal ideation in both younger and older adults. These findings suggest that hope and self-forgiveness may confer resilience against suicidal ideation in the presence of these risk factors.
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Chapter 1: Introduction

Over one million individuals die by suicide worldwide every year, more than those killed in armed conflicts during the same time span (World Health Organization, 1999). According to the Centers for Disease Control (2012), suicide was the cause of death for 38,364 Americans in 2010 alone, representing the 10th leading cause of death for all age groups in the United States. Thus, on average, there is one death by suicide in the United States every 15 minutes. In addition to the human costs of suicide and suicide attempts, self-inflicted injuries are estimated to cost Americans over one billion dollars in medical expenses, and over thirty-two billion dollars in lost productivity every year (Corso, Mercy, Simon, Finkelstein, & Miller, 2007).

Suicide does not often happen at random or without warning. Research has shown that the majority of individuals who die by suicide discuss their distress with at least one other person before their death (American Psychiatric Association, 2003). There are also specific patterns of an increased prevalence of suicide in many groups. If individuals at risk for suicide are identified early, there are a variety of psychological and pharmacological interventions that can be employed to reduce their risk, up to and including involuntary hospitalization.

Risk Factors for Suicide

A risk factor, using Mos´cicki’s (2001) definition, is a “characteristic, variable, or hazard that increases the likelihood of development of an adverse outcome, which is measurable, and which precedes the outcome” (p. 315). One of the most common approaches to the study of suicide is to examine large demographic datasets to identify potential risk factors. Alternatively,
psychological autopsies (a research method in which mental health data are collected retrospectively after an individual’s death) are used to confirm the presence of risk factors in individuals post-mortem (Isometsä, 2001). From these studies, it is known that women attempt suicide significantly more often than men, but that men’s suicide attempts are more likely to be lethal, and thus more men overall die by suicide (CDC, 2012). With regard to race and ethnicity, African American, Hispanic, and Asian individuals have lower suicide rates, whereas Caucasians, Native Americans, and Pacific Islanders have significantly higher rates of suicide (CDC, 2012). Caucasian males are at particular risk, representing 73% of individuals who die by suicide (Maris, Berman, Silverman, & Bongar, 2000).

In addition to gender, race, and ethnicity, numerous other risk factors for suicide have been identified. Demographic factors such as being gay, lesbian, or bisexual (Hill & Pettit, 2012; King et al., 2008), health factors such as chronic physical illness or head injury (APA, 2003; Harris & Barraclough, 1998; Johansson, Sundquist, & Johansson, 1997; Mann, Waternaux, Haas, & Malone, 1999), and personality factors such as high levels of neuroticism, impulsiveness, aggression, and introversion (Horesh et al., 1997; Romanov et al., 1994; Roy, 1998; Segal, Marty, Meyer, & Coolidge, 2012) have all been associated with higher risk for suicide. Environmental or sociological factors such as unemployment, economic distress, and the presence of a firearm in the home have also been associated with a higher risk of suicide (Kellermann et al., 1992; Rehkopf & Buka, 2005). Social factors including divorce, separation, loneliness, living alone, and having a friend or family member who has died by suicide also confer a greater risk for suicide (Chioqueta & Stiles, 2007; Duberstein et al., 1999; Kposowa, 2000; Trout, 1980; Wiktorsson, 2012). Finally, individuals with a history of physical and sexual
abuse attempt and complete suicide at a higher rate than those without such histories (Brown, Cohen, Johnson, & Smailes, 1999a; Molnar, Berkman, & Buka, 2001).

There is a particularly strong association between suicide and the presence of one or more psychological disorders. Conwell et al. (1996) found evidence that over 90% of individuals who die by suicide would have met criteria for a mental health diagnosis. Psychological disorders associated with increased risk of suicide include: eating disorders (Harris & Barraclough, 1998), borderline personality disorder (APA, 2003), psychotic disorders (Baxter & Appleby, 1999), mood disorders (particularly bipolar disorder; Harris & Barraclough, 1998; Kleespies & Dettmer, 2000), and anxiety disorders (Harris & Barraclough, 1998; Sareen et al., 2005). Individuals suffering from substance abuse or dependence, particularly with a co-morbid psychological disorder, are at an increased risk (Baxter & Appleby, 1999), as are individuals in the year following a psychiatric hospitalization (Qin & Nordentoft, 2005). Interestingly, the number of comorbid psychological disorders may be more predictive of overall suicide risk than the individual disorders themselves (Kessler, Borges, & Walters, 1999; Nock & Kessler, 2006); this might suggest that the relationship between psychological disorders and suicide risk is mediated by other common factors, such as risk factors contributing to the etiology of the disorders or the sequelae of the disorder resulting in impaired functioning.

Two populations that are at particular risk of suicide are college students and older adults. Suicide is the third most common cause of death for 15-24 year old Americans, and more individuals in this age category die from suicide than heart disease, liver diseases, respiratory diseases, and HIV combined (CDC, 2012). Moreover, 15-24 year olds have a substantially higher number of non-fatal suicide attempts than the general population (McIntosh, 2009). Suicide attempts are less common in older adults (Mos'cicki, 2001), but their rate of death by
suicide is substantially higher than the general population, particularly for Caucasian males (Conwell, Duberstein, & Caine, 2002). This difference in the lethality of attempts in older adults may be due to a decreased chance of rescue due to isolation, a decreased physical resilience, or greater intent or resolve to die (APA, 2003).

While much is known about risk factors at the population level, one of the enduring difficulties within the field of suicidology is the accurate prediction an individual’s risk of suicide in a reasonable timeframe (Joiner, 2005). Suicide is a complicated phenomenon with numerous correlates and antecedents; a review of the literature conducted by Wingate et al. (2004) identified more than 75 distinct suicide risk factors and warning signs. Attempts to model suicide risk using numerous suicide risk factors have resulted in algorithms that retrospectively identify only 5% (Powell, 2000) to 50% (Pokorny, 1983) of individuals who die by suicide, and produce an exceedingly high number of false-positives. Clinical judgment does not appear to fare any better; a meta-analysis of the rate of suicide within one year of a psychiatric hospitalization found that only 3% of individuals who were previously categorized as “high risk” died by suicide during this period (Large, Sharma, Cannon, Ryan, & Nielssen, 2011). Additionally, 60% of the individuals who died by suicide were previously categorized as “low risk.” While many of the high-risk individuals may have had additional interventions, the statistics above demonstrate that the current tools for the identification of at-risk individuals have significant room for improvement.

Much of the research on suicide focuses on factors that are largely chronic, immutable, and weakly related to immediate suicide risk. Because of the relative infrequency of suicide at the individual level, the vast majority of individuals in high-risk groups do not ultimately attempt or die by suicide. For example, 6,008 older adults died by suicide in 2010 (CDC, 2012). Given
that there are 40 million adults over the age of 65 in the United States, this represents less than .01% of this high-risk population. Similarly, one of the most robust predictors of suicide risk is the number and severity of previous suicide attempts (Joiner, 2005). However, this predictor is of limited utility when evaluating individuals before their first suicidal crisis, and this limitation is particularly serious given that approximately half of serious first-time suicide attempts are fatal (Rudd & Joiner, 1996). Even this predictor is of limited utility in forecasting suicide risk in the short term. A recent study conducted in Finland found that in the five years following a serious suicide attempt, only 30% of individuals attempted suicide at least one more time, and only 10% of those individuals died by suicide (Haukka, Suominen, Partonen, & Lonqvist, 2008). Given that the study spanned 260 weeks, the chance of any of these individuals having a suicidal crisis within any single week is incredibly small. Furthermore, the majority of known risk factors for suicide are either completely immutable (e.g., age, gender, or suicide behavior history) or are unlikely to change over the course of crisis-relevant time scales (e.g., severe psychopathology).

The Interpersonal-Psychological Theory of Suicide

The interpersonal-psychological theory of suicide (IPTS; Joiner, 2005; Van Orden et al., 2010) is one model of suicidal behavior that may improve the accuracy of suicide risk assessment because it concentrates on the interaction of interpersonal and intrapersonal factors that are measurable, proximal, and potentially malleable. According to the IPTS, the individuals who are at risk for ending their own lives are those who possess both the desire and the capability to do so. Joiner (2005) posits that the desire to die by suicide arises in part from the self-perception that an individual is a burden upon loved ones or society as a whole, i.e., “perceived burdensomeness,” and that his/her attempts to connect with valued individuals or
groups are unsuccessful, i.e., “thwarted belonging.” Joiner further suggests that this desire to die by suicide will not lead to ending one’s life unless one has the capability of overcoming the protective instincts and fear surrounding suicide, which is often acquired through habituating experiences such as exposure to violence, non-suicidal self-injury, or previous suicide attempts, i.e., “acquired capability.” Joiner presents each element of the IPTS model as conferring suicide risk individually, but those with both high levels of perceived burdensomeness and thwarted belonging would have the strongest desire for death, and that those that have both the desire for death and the acquired capability would be at the greatest risk of dying by suicide.

**Perceived Burdensomeness**

Multiple studies have found empirical support for all three components of the IPTS, and perceived burdensomeness in particular, as independent predictors of suicidal behavior. An analysis of suicide notes found that ratings of perceived burdensomeness were greater in individuals who completed suicide than in individuals who attempted suicide, and that the lethality of the means utilized in the attempt was also correlated with ratings of perceived burdensomeness (Joiner, Pettit, Walker, Voelz, & Cruz, 2002; Pettit et al., 2002). Interviews with individuals who have attempted suicide also often contain themes of perceived burdensomeness. For example, “making others better off” is often listed as a reason for previous suicide attempts by women with borderline personality disorder (Brown, Comtois, & Linehan, 2002). Similarly, suicidal adolescents report feelings of being “expendable” by their families at higher rates than non-suicidal adolescents (Woznica & Shapiro, 1990). Finally, college students’ self-ratings of their potential benefits toward their genetic relatives, as well as the quality of their social bonds, were negatively correlated with suicidal ideation (Brown, Dahlen, Mills, Rick, & Biblarz, 1999b).
Using an instrument specifically designed to measure Joiner’s conceptualization of perceived burdensomeness and thwarted belonging (Van Orden, Witte, Gordon, Bender, & Joiner, 2008a), researchers found perceived burdensomeness to be associated with both current suicidal ideation and past suicide attempts, even after controlling for traditional predictors of suicidal risk including age, gender, depressive symptoms, and hopelessness (Brown et al., 2009; Kanzler, Bryan, McGeary, & Morrow, 2012; Van Orden, Lynam, Hollar, & Joiner, 2006). The positive correlation between perceived burdensomeness and suicidal ideation has been observed in multiple samples, including college students (Van Orden et al., 2008b), African American college students (Davidson, Wingate, Slish, & Rasmussen, 2010; Lamis & Lester, 2012), African American adolescents (Merchant, 2010), outpatients (Van Orden et al., 2006), and older adults (Cukrowicz, Cheavens, Van Orden, Ragain, & Cook, 2011; Jahn, Cukrowicz, Linton, & Prabhu, 2011).

**Thwarted Belonging**

There is also a growing body of evidence supporting thwarted belonging as a significant contributor to suicidal ideation. On a theoretical level, Baumeister and Leary's (1995) “need to belong” theory provides a mechanism by which social isolation could create a desire for suicide. Baumeister and Leary posit that human beings have evolved an emotional need to be an accepted member of a group, and that having that need go unmet generates significant agitation and distress that may lead individuals to attempt suicide. The lack, or disruption, of social bonds has repeatedly been found to be a risk factor for suicide; social isolation (Trout, 1980), feelings of loneliness (Wiktorsson, 2012), peer rejection (Prinstein, Boergers, Spirito, & Little, 2000), low family cohesion and closeness (Eshun, 2003), family conflict (Chang, 2010), and low perceptions of social support (APA, 2003) have all been linked with increases in suicidal
ideation or behavior. Similarly, events that increase feelings of connection have been found to be associated with a decreased risk of suicide. Hypothesizing that sporting events may provide a temporary feeling of connection and belonging, Joiner, Hollar, and Van Orden (2006) found that the success of two collegiate football teams was negatively correlated with suicide rates in the surrounding areas. More directly, volunteering during times of crisis has been found to lower levels of thwarted belonging and perceived burdensomeness, potentially explaining the finding of lower suicide rates during natural disasters by providing opportunities for individuals to meet their needs of connection and contribution (Gordon, Bresin, Dombeck, Routledge, & Wonderlich, 2011).

Measuring this construct more directly with the Interpersonal Needs Questionnaire (INQ), Conner, Britton, Sworts, and Joiner (2007) found that thwarted belonging differentiated those opioid addicts who had previously attempted suicide from those who had unintentionally overdosed, suggesting that the thwarted belonging conferred specific risk for suicidal behavior in this already at-risk population. Similarly, You, Van Orden, and Conner (2011) found that interpersonal conflict and high levels of thwarted belonging were predictive of current levels of suicidal ideation. In addition, they found that perceived lack of social support, living alone, and thwarted belonging were all predictive of the number of previous suicide attempts made by individuals undergoing residential substance abuse treatment. In a separate study, VanOrden et al. (2008b) found that measures of thwarted belonging mediated the increase in suicidal ideation found in college students attending classes during the summer, which presumably results from a reduction of social assets on campus. Finally, recent studies have shown that follow-up phone contact with individuals who have attempted suicide significantly reduces the number of subsequent suicide attempts and completions, presumably by creating a “temporary artificial
social support network” and increasing feelings of belonging (De Leo, 2002; Fleischmann, 2008).

**Acquired Capability**

In addition to the evidence for perceived burdensomeness and thwarted belonging, there is also a growing body of research to support Joiner’s (2005) conceptualization of how individuals acquire the capability to end their own lives. Joiner suggests that instincts for self-preservation, and the fear of pain accompanying self-harm, would typically prevent individuals with suicidal desires from acting on them. However, individuals acquire the capability to die by suicide through exposure to painful and provocative events, which may habituate them to physical pain and the fear of self-harm. The number and severity of previous suicide attempts has been found to be one of the most robust predictors of the risk for, and the lethality of, future suicide attempts (Van Orden, Merrill, & Joiner, 2005). Physical and violent sexual abuse during childhood, which Joiner suggests may lead to habituation to pain and suffering, is associated with a higher rate of suicide in adulthood than is molestation or verbal abuse (Joiner et al., 2007). In a sample of adolescents, the length of time in which they had engaged in non-suicidal self-injury, the number of means used to self-injure, and reports of painlessness while self-injuring were all correlated with the number of previous suicide attempts (Nock, Joiner, Gordon, Richardson, & Prinstein, 2006). Individuals receiving medical treatment for suicide attempts have been found to have higher pain tolerances on a cold-pressor task than those being treated for other injuries, suggesting that their attempts to end their own lives may have habituated them to physical pain (Orbach, Mikulincer, King, Cohen, & Stein, 1997; Orbach et al., 1996).
addition to self-harm, evidence suggests that working in professions with routine exposure to pain or violence, such as medicine, law enforcement, or military service, is associated with higher rates of acquired capability and suicide (Hawton, Clements, Sakarovitch, Simkin, & Deeks, 2001).

There is also more direct evidence of the link between exposure to violent and painful events and the acquired capability to die by suicide based on the Acquired Capability for Suicide Scale (ACSS; Van Orden, Witte, Gordon, Bender, & Joiner, 2008a), an instrument specifically designed to measure the acquired capability component of the IPTS. Van Orden et al. (2008a) found that scores on the ACSS correlated with both the number of previous suicide attempts and the number of painful events experienced in a clinical sample. In another study, ACSS scores were correlated with both the number of previous traumatic events reported by college students and a higher pain tolerance using a pressure algometer (Bender, Gordon, & Joiner, 2007).

Additionally, soldiers who have been exposed to combat involving violence or personal injury have higher scores on the ACSS than soldiers serving in other roles (Bryan et al., 2010; Bryan & Cukrowicz, 2011; Bryan, Cukrowicz, West, & Morrow, 2010a). Veterans with PTSD who report re-experiencing symptoms, such as flashbacks, have higher scores on the ACSS than those who do not, suggesting the possibility that these symptoms may continue to desensitize these individuals to pain and violence long after the original trauma (Bryan & Anestis, 2011).

**Confirming the IPTS model**

There is also support for theory-consistent relationships among the three components of the IPTS in the prediction of suicidal thoughts and behavior. Veterans who experienced higher levels of suicidal ideation have been found to express themes of acquired capability, perceived burdensomeness, and thwarted belonging in structured interviews and case studies (Anestis,
There is also evidence that each component of the IPTS model accounts for unique variance in suicidal ideation and behavior; thwarted belonging and perceived burdensomeness were both significant independent predictors of suicidal ideation in African American college students (Davidson et al., 2010), and thwarted belonging, perceived burdensomeness, and acquired capability were each independent predictors of suicidal ideation in a multi-race college student sample (Davidson, Wingate, Rasmussen, & Slish, 2009). Additionally, Joiner et al. (2009) found that the interaction between "mattering" (as a proxy for perceived burdensomeness) and family social support (as a proxy for belonging) was associated with suicidal ideation in a large school-based sample of depressed adolescents.

Supporting the predicted interactions within Joiner’s model, Van Orden et al. (2008a) found that the interaction between high levels of perceived burdensomeness and high levels of thwarted belonging was associated with higher levels of suicidal ideation in college students than could be explained by the main effects in isolation. Van Orden et al. (2008a) conducted a second study with a clinical sample, and found that the interaction between participants’ scores on measures of perceived burdensomeness and acquired capability accounted for more variance in clinicians’ ratings of suicide risk than the main effects of these variables. The interaction between high levels of perceived burdensomeness and high levels of thwarted belonging was associated with greater suicidal ideation in older adults, such that those with high levels of both perceived burdensomeness and thwarted belonging experienced significantly more suicidal ideation than could be accounted for by the main effects of these variables (Marty, 2011). In active duty personnel, the interaction between high perceived burdensomeness and high acquired capability was also associated with a higher number of previous suicide attempts (Bryan, Cornette, & Joiner, 2009; Brenner et al., 2008).
Morrow, Anestis, & Joiner, 2010b) as well as current suicidal behavior (Bryan, Clemans, & Hernandez, 2012).

The theory that those with high levels of thwarted belonging, perceived burdensomeness, and acquired capability are at the greatest risk of dying by suicide has been replicated in numerous samples. Joiner et al. (2009) found that the three way interaction between perceived burdensomeness, thwarted belonging, and number of past suicide attempts (as a proxy of acquired capability) differentiated between individuals who were receiving services in response to a recent suicide attempt and those who were receiving other psychological services, suggesting that this three-way interaction was particularly associated with suicide risk. Similarly, Anestis and Joiner (2011) found that the three-way interaction between high levels of perceived burdensomeness, thwarted belonging, and acquired capability was related to a greater number of previous suicide attempts in college students. Christensen, Batterham, Soubelet, and Mackinnon (2013) found in a large community sample that there was a significant interaction between perceived burdensomeness and thwarted belonging in the prediction of suicidal ideation, and that the interaction between suicidal ideation and acquired capability explained unique variance in participant’s number of previous suicide attempts. Taken together, these findings support Joiner’s (2005) IPTS model, such that high levels of perceived burdensomeness and thwarted belonging lead to suicidal ideation and desire, and that that desire is most likely to be translated into suicidal behavior in individuals with high levels of acquired capability.

**Extending the IPTS Model**

Ribeiro and Joiner (2011) observed that with the establishment of a preliminary evidence base, a logical extension of the IPTS model would be to examine how it interacts with other risk factors known to influence suicide. More traditional risk factors may be independently
associated with suicidal ideation or behavior. Conversely, they may confer risk by moderating or mediating elements of the IPTS, or by being moderated or mediated by elements of the IPTS. Following in this vein, perceived burdensomeness has been found to mediate the relationship between depression and suicidal ideation in older adults (Jahn et al., 2011) and college students (Davidson, Wingate, Grant, Judah, & Mills, 2011). Perceived burdensomeness has been found to mediate the relationship between maladaptive perfectionism and suicidal ideation in college students (Rasmussen, Slish, Wingate, Davidson, & Grant, 2012), as well as the relationship between alcohol-related problems and suicidal ideation (Lamis & Malone, 2011). Likewise, perceived burdensomeness partially mediates the relationship between suicidal ideation and sexual orientation (Hill & Pettit, 2012). Finally, the four-way interaction with the three components of Joiner’s model and negative urgency (a tendency to maladaptively attempt to regulate negative emotions) was found to explain significantly more variance in the previous number of suicide attempts in college students than a three-way interaction containing only Joiner’s model (Anestis & Joiner, 2011). Thus, numerous studies have demonstrated the value of testing model-based hypotheses in a multivariate context over the traditional paradigm of examining suicide risk factors in isolation.

While the majority of the extensions to Joiner’s model have focused on interactions with psychopathology or other risk factors, investigating its interactions with protective factors may provide a fruitful avenue of research. The presence of protective factors is likely one of the reasons the majority of individuals possessing significant risk factors for suicide do not ultimately die by suicide (Beautrais, Collings, & Ehrhardt, 2005). Thus, including appropriate protective factors in the assessment and modeling of suicide risk could be expected to
substantially increase its accuracy. Additionally, identifying significant protective factors may provide novel targets for clinical intervention to decrease suicide risk.

**Protective Factors**

Psychological or demographic variables may be considered protective if they are associated with a lower risk of suicide (Mosckicki, 2001). Unfortunately, there is substantially less research on protective factors than there is on constructs related to suicide risk. A keyword search for “suicide” and “risk factors” in the research database PsychINFO conducted in May of 2012 returned 366 articles, whereas a search for “suicide” and “protective” as well as a search for “suicide” and “resilience” only produced a total of 14 articles. Similarly, many of the suicide risk assessment instruments used in clinical practice do not include the evaluation or consideration of protective factors (Kene-Allampalli et al., 2010; Kene-Allampalli, Hovey, Meyer, & Mihura, 2009; Posner et al., 2011). Of the 27 standardized instruments to assess suicide risk identified in a comprehensive literature review by Brown (2001), only four include formal consideration of protective factors.

Despite their relative neglect within the literature, numerous factors are associated with a lower risk of suicide. African American, Asian, and Hispanic individuals die by suicide at lower rates than the general population, despite being exposed to higher levels of numerous risk factors (CDC, 2012; Davidson et al., 2010). Protective social factors include being married (Kposowa, 2000), having children (Hoyer & Lund, 1992), perceiving adequate social support (Chioqueta & Stiles, 2007), and having at least one positive interpersonal relationship (Eisenberg, Ackard, & Resnick, 2007). Other factors associated with lower rates of suicide include high levels of life satisfaction (Chioqueta & Stiles, 2007), self-esteem (Demirbas, Celk, Ilhan, & Dogan, 2003), and religiosity (Nonnemaker, McNeely, & Blum, 2003).
Defining constructs in the literature as either protective factors or risk factors is often difficult and somewhat arbitrary, as many factors that have been conceptualized as protective are the positive extremes of factors conceptualized as conferring risk. For example, the lack of social engagement and the disruption of social bonds are traditionally considered risk factors, whereas the presence of social bonds and social engagement is often viewed as a protective factor. Similarly, racial and ethnic minorities are considered to have a lower risk of suicide because of the increased presence of protective factors such as family cohesion (Meadows, Kaslow, Thompson, & Jurkovic, 2005), community support (Compton, Thompson, & Kaslow, 2005), and taboos against suicide (Marion & Range, 2003), but Caucasian individuals are often described as having an increased risk of suicide because of the relative lack thereof.

One alternative view, presented by Johnson, Wood, Gooding, Taylor, and Tarrier (2011) as the “buffering hypothesis,” differentiates between protective factors and psychological constructs that promote resilience, which is defined as “a separate dimension to risk, which acts to moderate the impact of risk on an outcome.” According to Johnson et al., both risk and resilience factors are bipolar constructs, with the positive extreme of a risk factor functioning as a protective factor, and with the absence or inverse of a resilience factor serving to amplify the effects of existing risk factors. Methodologically, resilience factors can be differentiated from risk factors by determining if their relationship to suicidal ideation or behavior occurs primarily through direct effects or by moderating the effects of other variables. For example, Johnson et al. argue that the ability to list multiple reasons for living is a protective factor, as multiple studies have found it to have a negative correlation with suicidal ideation and behavior (Galfalvy et al., 2006; Innamorati et al., 2006), but have failed to observe it interacting with other risk factors (Bonner & Rich, 1988). Alternatively, low levels of acquired capability could be conceptualized as a
resilience factor, as several studies have found that it moderates the relationship between suicidal desire and behavior (Anestis & Joiner, 2011; Joiner et al., 2009). Hence, individuals who have low levels of acquired capability are less likely to engage in suicidal behavior in the presence of suicidal desire, and individuals with high levels of acquired capability are more likely to translate suicidal desire into suicidal behavior.

Self-Forgiveness

Forgiveness is a trait that may function as a resilience factor in relation to the IPTS model. Forgiveness, as defined by Thompson et al. (2005), is “the framing of a perceived transgression such that one’s responses to the transgressor, transgression, and sequelae of the transgression are transformed from negative to neutral or positive.” Forgiveness can be directed toward the self, others, or a situation. Self-forgiveness may be of interest with regard to the IPTS, as perceiving one’s self to be a burden implies that one is committing a transgression against others. The ability to forgive one’s self for these transgressions may decrease the distress that these perceptions of burdensomeness produce. Dispositional self-forgiveness has been shown to be negatively correlated with numerous risk factors for suicide, including anxiety, depression, and neuroticism (Maltby, Macaskill, & Day, 2001; Thompson et al., 2005; Toussaint & Webb, 2007), and positively correlated with protective factors such as life satisfaction and quality of life (Romero et al., 2005; Thompson et al., 2005). Self-forgiveness is also associated with lower levels of non-suicidal self-injury (Westers, 2010; Westers, Rehfuss, Olson, & Biron, 2012).

Relatively little research has been conducted on the direct relationship between suicide risk and self-forgiveness. Ahadi and Ariapooran (2009) found that self-forgiveness was negatively correlated with depression and suicidal ideation in a sample of divorced Iranian women. Additionally, Hirsch, Webb, and Jeglic (2011) found that self-forgiveness moderated the
relationship between anger and suicidal behavior such that the relation between anger and suicidal behavior was weaker at higher levels of self-forgiveness. Of particular relevance to clinical intervention, relatively brief group therapy programs produced increases in dispositional self-forgiveness, which correspond with decreases in depressive symptoms, anxiety, stress, and anger (Harris et al., 2006; Lin, 2010).

**Hope**

Hope is another trait that may have particular relevance as a resilience factor in relation to the IPTS model. Hope, as defined by Snyder, Irving, and Anderson (1991), comprises an individual’s expectations toward goal attainment, consisting of one’s perceived ability to plan and create strategies to attain his or her goals (pathways) and one’s motivation or perceived ability to pursue those pathways to completion (agency). Hope is negatively correlated with constructs known to increase suicidal ideation, such as depression and anxiety (Arnau, Rosen, Finch, Rhudy, & Fortunato, 2007; Geffken et al., 2006; Snyder et al., 1997; Thio & Elliott, 2005), and positively correlated with constructs associated with decreased suicidal ideation, such as self-esteem and optimism (Rasmussen, 2006; Snyder et al., 1996). Importantly, hope is negatively correlated with suicidal ideation (Zhang, Law, & Yip, 2011), and was even found to be a more robust predictor of suicidal ideation than hopelessness (Range & Penton, 1994). Similarly, the correlation between suicidal thoughts and behaviors and hope held after controlling for the effects of alcoholism and depression (McKay, 2007). Hope is potentially malleable, and interventions have been successfully developed to increase the components of hope and decrease symptoms of depression in various samples (i.e., a community sample, Cheavens, Feldman, Gum, Michael, & Snyder, 2006; an older adult sample, Klausner et al.,
and settings (i.e., emergency room, Kondrat & Teater, 2011; and in a brief group session, Feldman & Dreher, 2011).

Two studies have examined the correlations between hope and the components of the IPTS model to date. Davidson, Wingate, Rasmussen, and Slish (2009) found that hope was negatively correlated with thwarted belonging and perceived burdensomeness, was positively correlated with acquired capability, and had no correlation with suicidal ideation in a college student sample. In a second study, Davidson, Wingate, Slish, and Rasmussen (2010) found that hope was negatively correlated with thwarted belonging, perceived burdensomeness, and suicidal ideation, and positively correlated with acquired capability in an African American college student sample.

The positive correlation between acquired capability and hope appears paradoxical at first, as hope is traditionally viewed as a protective factor, and higher levels of acquired capability are associated with a greater risk of suicide. However, Snyder’s (2002) conceptualization of hope is defined only with regard to an individual’s goals and objectives, regardless of whether those goals are condoned by society. The act of dying by suicide requires goal setting, planning out a means, and significant effort to implement those means, which is theoretically consistent with hope (Joiner, 2005). Davidson et al. (2010) argued that high levels of hope may also lead individuals to persist in painful and provocative experiences in pursuit of their goals, functioning to increase their acquired capability over time. Along these same lines, Snyder et al. (2005) found that individuals with high levels of hope demonstrated higher pain tolerances.

It is more difficult to determine why Davidson, Wingate, Rasmussen, and Slish (2009) did not observe a significant correlation between hope and suicidal ideation, given that such a
relationship was observed in three other studies (Davidson et al., 2010; McKay, 2007; Range & Penton, 1994). One explanation may be that by using a traditional college student sample and a four-question measure of suicidal ideation, there was insufficient variance in suicidal ideation to detect this relationship. However, because the means and standard deviations of the measures were not published within the article, it is not possible to test this hypothesis directly.

**Current Study**

Given the growing body of evidence supporting the IPTS, examining the relationships between its constructs and other factors that may affect suicide risk is a logical progression in our understanding of suicide risk. Resilience factors may provide a fruitful avenue of inquiry and have yet to be fully explored in relation to suicidal behaviors, desires, and the IPTS model. Specifically, I sought to examine the interaction of hope and self-forgiveness with the components of the IPTS model in accounting for variance in suicidal ideation. I hypothesized that self-forgiveness would serve as a resilience factor in relation to perceived burdensomeness. One’s perception of being a burden upon loved ones or society may constitute a transgression that one contemplates remediying through suicide. Individuals with high dispositional levels of self-forgiveness may have the cognitive skills to mitigate the distress that these perceptions produce, regardless of the actual burden that one represents. Thus, I hypothesized that self-forgiveness would moderate the relationship between perceived burdensomeness and suicidal ideation, such that the relationship between perceived burdensomeness and suicidal ideation would be attenuated in individuals with high levels of self-forgiveness.

I also hypothesized that hope is particularly relevant to thwarted belonging. In pursuing goals, individuals with high hope are thought to be able to devise more strategies to attain their
goals, and to be better able to develop alternative routes when their chosen strategy is blocked (Irving, Snyder, & Crowson, 1998). Thus, individuals with high dispositional levels of hope may perceive any current difficulties in meeting their need for feelings of belonging as a transitory state or a goal to be conquered. In previous research, hope has been found to be negatively correlated with thwarted belonging (Davidson et al., 2009) and more strongly correlated with thwarted belonging than perceived burdensomeness (Davidson et al., 2010). Thus, I hypothesized that hope would serve as a resilience factor by moderating the relationship between thwarted belonging and suicidal ideation, such that the relationship between thwarted belonging and suicidal ideation would be attenuated in individuals with high levels of hope. Specifically, this thesis will test the following four hypotheses:

**H1.** Replicating previous research, there will be a positive correlation between hope and acquired capability.

**H2.** Replicating previous research, the main effects of thwarted belonging and perceived burdensomeness will account for unique variance in suicidal ideation, after controlling for depressive symptoms and demographic variables.

**H3.** Self-forgiveness will moderate the relationship between perceived burdensomeness and suicidal ideation

**H4.** Hope will moderate the relationship between thwarted belonging and suicidal ideation.

To test these hypotheses, two studies were conducted in samples comprised of individuals at particular risk for suicide and suicidal ideation: older adults and college students. In the first study, I analyzed an existing dataset of questionnaires completed by older adults to test the potential moderation of the IPTS model by hope and self-forgiveness. To validate and
generalize the results of this study, a second dataset was collected from a college-student sample, and the analyses were replicated.
Chapter 2: Methods for Study 1

Participants

Participants were 105 older adults (60 years of age or older) living in Texas. The mean age of the participants was 70.9 ($SD = 7.63$), including 27 (26%) men and 78 (74%) women. With regard to race and ethnicity, 91% of the individuals in the study self-identified as White, 1% as Black or African American, 6% as Hispanic, 1% as Native American, and 1% as “other.” While this sample is representative of the community in Texas from which it was drawn (Cukrowicz et al., 2011), it contains an over-representation of White individuals and an under-representation of racial and ethnic minorities in comparison to the nation at large.

Measurement/Instrumentation

Geriatric Suicide Ideation Scale- Suicide Ideation Subscale. The Geriatric Suicide Ideation Scale- Suicide Ideation Subscale (GSIS-SI; Heisel & Flett, 2006) is a 10-item subscale of the GSIS that assesses suicidal thoughts and desires. The GSIS is measured on a five point Likert scale with anchors ranging from Strongly Disagree (1) to Strongly Agree (5), resulting in a total score from 10-50. Previous research has found adequate levels of internal consistency (.82) and test-retest reliability over a two-month period (.78) (Heisel & Flett, 2006). Internal consistency for the GSIS-SI was good in this sample ($\alpha = .91$).

Center for Epidemiologic Studies Depression Scale. The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) is a 20-item self-report scale designed to
measure the presence and severity of depressive symptoms in the general population. Items are rated on 4-point response scale ranging from 0 = “rarely or none of the time” to 3 = “most or all of the time”, and summed to compute a total score. The CES-D has evidenced very high internal consistency in both clinical (Cronbach alpha coefficient = .90) and non-clinical (alpha = .85) samples as well as adequate test-retest reliability (Radloff, 1977). Internal consistency for the CES-D was good in this sample (α = .93).

**Interpersonal Needs Questionnaire.** The Interpersonal Needs Questionnaire (INQ: Van Orden et al., 2008a) is a 12-item scale in which 7 items are averaged to compute a Perceived Burdensomeness subscale score (INQ-PB) and 5 items are averaged to compute a Thwarted Belonging subscale score (INQ-TB). Items are rated on a 7-point response scale ranging from 0 = “not at all true for me” to 6 =“very true for me.” Previous researchers have found adequate internal consistency for the Perceived Burdensomeness subscale (α = .93) and the Thwarted Belonging subscale (α = .92; Freedenthal, Lamis, Osman, Kahlo, & Gutierrez, 2011). In this sample, both the INQ-PB (α = .91) and INQ-TB (α = .89) had good internal consistency.

**The Hope Scale.** The Hope Scale (HS; Snyder et al., 1991) is a 12-item self-report measure that assesses an individual’s ability to successfully determine pathways toward desired goals, and their agency in following those pathways to completion. The scale consists of four items that measure pathways thinking, four items that measure agency, and four distracter items. Respondents rate each of the items on an 8-point Likert scale ranging from 1 (definitely false) to 8 (definitely true). The total score for the scale has been shown in previous research to have good internal consistency (α = .74) and test-retest reliability (.85 over a 3-week interval; Snyder et al., 1991). Internal consistency for the Hope total score was adequate (α = .82) in this sample.
The Heartland Forgiveness Scale- Self Forgiveness Subscale. The Heartland Forgiveness Scale- Self Forgiveness Subscale (HFS-Self: Thompson et al., 2005) is an 6-item self-report measure that assesses an individual’s ability to forgive themselves for perceived transgressions. Respondents rate each item on a 7-point Likert scale based upon the extent to which it describes them (“almost always false of me” to “almost always true of me”). The internal consistency of the HFS-Self has been found to be acceptable in previous research ($\alpha = .72$; Thompson et al., 2005) and in the present study ($\alpha = .77$).

The Acquired Capability for Suicide Scale. The Acquired Capability for Suicide Scale (ACSS; Van Orden et al., 2008a) is a 20-item measure designed to assess one’s fearlessness or desensitization to lethal self-injury. Participants rate each item on a 0 (not at all like me) to 4 (very much like me) Likert-type scale. Internal consistency was adequate in previous research ($\alpha = .83$; Davidson, 2007), and in the present sample ($\alpha = .80$).

The Mini Mental State Exam. The Mini Mental State Exam (MMSE; Folstein, Folstein, & McHugh, 1975) is an 11-item measure designed to screen for cognitive impairment. The instrument contains a variety of questions assessing orientation, registration, attention, recall, and verbal language. The MMSE has been found to have adequate internal consistency ($\alpha = .6$ to .9) and test-retest reliability ($r = .85$ over 24-hours) in previous research (Mitchell, 2013). Internal consistency for the MMSE was good in this sample ($\alpha = .88$).

Demographics Questionnaire. Six self-report items were included to gather basic information about participants’ age, sex, ethnicity, marital status, education, previous mental health diagnoses, and previous suicide attempts.
**Study Procedure**

Participants completed the measures in a research-clinic setting at Texas Tech University. Participant’s responses were reviewed for indications of current distress or suicide risk. A licensed psychologist was available to evaluate suicide risk and facilitate hospitalization, if appropriate, at all times. All participants were provided access to a list of local mental health resources. The study was approved by an IRB board, and additional information about study procedures may be obtained through the original publication (Cukrowicz et al., 2011).

Of the original 105 participants in the study, 5 participants were excluded from these analyses because they scored 24 or lower on a Mini Mental State Exam (Folstein et al., 1975) administered before the study’s questionnaires, indicating potential cognitive deficits. Additionally, 7 participants were excluded due to having insufficient data to compute valid scores on one or more of the instruments in the analysis. This produced a total sample of 93 participants included in the subsequent analyses.
Chapter 3: Results for Study 1

Data Analytic Plan and Preparation

The distribution of the scores on each variable was examined through descriptive statistics and histograms to detect possible outliers or miscoded data. Means and standard deviations were computed for all of the variables of interest (see Table 1), and were found to be similar to estimates in previous research within this population. All analyses were conducted using SPSS 20 unless otherwise specified.

In preparation for the multiple regression analyses, participants’ gender was dummy coded to contrast men against the reference group of women. Participants’ marital status, which was categorical with 7 values in the original dataset, was recoded as divorced, widowed, and unmarried, for comparison against the reference group of married participants. Minority races and ethnicities were dummy coded as minority status for comparison against Caucasian participants, given the small number of minorities in this sample (n = 6). The total scores on all continuous measures were standardized to decrease the degree of multicollinearity in the interaction terms.

Checking for Assumptions

The assumptions of normality and homoscedasticity were checked by calculating the skewness and kurtosis of the total scores for the measures listed above and by visually inspecting histograms of each variable. All of the measures deviated from normality, and the CES-D, INQ-
TB, INQ-PB, and PAI-SUI all exhibited a substantial positive skew. This was not unexpected, as depression, loneliness, and suicidal ideation are all experiences that the majority of the population would not necessarily experience.

An examination of the normal P-P plots of the hierarchical multiple regression models indicated several departures in the standardized residuals from the expected normal distribution, which is consistent with the effects of including skewed variables in the regression analysis. Tolerance and VIF values were inspected for each variable in the regression model to determine their degree of collinearity, and no variables were found to excessively overlap. The residuals were then inspected to identify any multivariate outliers. Three participants were found to have residuals greater than three standard deviations from the mean, indicating a poor model fit for these individuals. Repeating the analysis after excluding these data points did not reveal any substantial differences in the model fit estimates or the beta coefficients, and it was decided to include these participants in the analyses presented below.

**Analyses**

A series of correlational analyses was conducted among all of the variables of interest to ensure that the direction and strength of the bivariate relationships were consistent with previous research. GSIS-SI totals scores were positively correlated with scores on the CES-D, INQ-TB, and INQ-PB, and all four measures were negatively correlated with HFS-Self scores and Hope Scale total scores (see Table 1). To test the first hypothesis, that there is a positive correlation between hope and acquired capability, a bivariate correlation was computed between the ACSS and Hope scale total scores. The resulting coefficient ($r = .16, p = .14$) was positive but not significant. Thus, Hypothesis 1 was not supported.
Hypotheses 2 through 4 were tested using a procedure recommended for the examination of moderation by Frazier, Tix, and Barron (2004). A hierarchical multiple regression model was computed with variables entered stepwise in a pre-specified order to determine if their inclusion significantly improved model fit (See Table 2). In the first step, age, gender, relationship status, and minority status were regressed upon the GSIS-SI total scores. The resulting model explained 5% of the variance in GSIS-SI scores, and was not significant, adjusted $R^2 = .05, F(6,87) = 1.86, p = .10$. In a second step, CES-D scores were added to the model that included the demographic predictors listed above in the first step. The resulting model was significant, and accounted for 35% of the variance in suicidal ideation, adjusted $R^2 = .35, F(7,86) = 8.28, p < .01$.

The main effects of INQ-TB and INQ-PB were introduced into a third step of the model to test Hypothesis 2, which states that thwarted belonging and perceived burdensomeness account for unique variance in suicidal ideation. The resulting model was significant, adjusted $R^2 = .57, F(9,84) = 14.40, p < .01$, and accounted for an additional 22% of the variance in GSIS-SI total scores. The model’s estimated beta coefficients indicate that participants’ scores on the INQ-TB and INQ-PB were significant, and were positively associated with scores on the GSIS-SI. Thus, Hypothesis 2 was supported.

In a fourth step, the main effects of Hope and HFS-Self were introduced. The resulting model was significant, adjusted $R^2 = .56, F(11,82) = .11.80, p < .01$, but did not account for more variance in the GSIS-SI scores than the previous model. To test Hypotheses 3, that self-forgiveness moderates the relationship between perceived burdensomeness and suicidal ideation, and Hypothesis 4, that hope moderates the relationship between thwarted belonging and suicidal ideation, the interactions between the Hope and INQ-TB scores and the HFS-Self and INQ-PB scores were introduced in a fifth step. The model was significant, adjusted $R^2 = .60, F(13,80) =$
11.9, \( p < .01 \) and represented a statistically significant increase of four percent of the variance accounted for in the GSIS-SI scores. The beta coefficients of the INQ-TB and the INQ-PB were significant and associated with higher GSIS-SI total scores, whereas the beta coefficients for the HFS-Self and the HFS-Self by INQ-TB interaction were significant and associated with decreases in GSIS-SI total scores. Thus, Hypothesis 3 was supported, such that self-forgiveness moderated the relationship between perceived burdensomeness and suicidal ideation in this sample. However, Hypothesis 4 was not supported, as the interaction between hope and thwarted belonging was not significantly different than zero.

Multiple regression is relatively robust to violations of the assumption of multivariate normality (Hair, Anderson, Tatham, & Black, 1998). However, because many of the variables in this analysis were positively skewed, a non-parametric bootstrapping procedure outlined by Fox (2002) was used to verify the results of the analysis by empirically constructing confidence intervals for the parameters tested in the previous model in a way that does not rely on the assumptions of multivariate normality. A total of 1000 random samples of 94 participants were drawn with replacement from the original dataset, regression models were calculated for each sample, and the resulting beta coefficients were saved. Using the boot package in R (version 2.15.2), a 95% confidence interval was constructed for the estimates of the beta coefficients of the Hope by INQ-TB interaction and the HFS-Self by INQ-TB interaction. The results were similar to those obtained using traditional hypothesis testing, with the 95% CI for the Hope by INQ-TB interaction [-0.91, 0.57] overlapping zero and indicating non-significance at the \( p = .05 \) level, while the 95% CI for the HFS-Self by INQ-PB interaction [-2.52, -0.58] excludes zero and is significant at the \( p = .05 \) level. These results confirm that the interaction between HFS-Self by INQ-PB did explain unique variance in GSIS-SI total scores within this sample, whereas the
Hope by INQ-TB interaction did not explain more variance in GSIS-SI totals scores than could be expected by chance.

A simple slopes analysis (Frazier, Tix, & Barron, 2004) was conducted in order to visualize the interaction between HFS-Self and INQ-TB scores. Using the beta coefficient estimates from the model including all predictors (i.e., all five steps), predicted GSIS-SI scores were computed for values one standard deviation above, at, and below the mean for HFS-Self and INQ-PB. The results (see Figure 1) indicate that the relationship between INQ-PB scores and GSIS-SI scores is substantially stronger at lower levels of HFS-Self than at higher levels of HFS-Self. Thus, HFS-Self scores moderate the relationship between INQ-PB and GSIS-SI total scores.
Chapter 4: Discussion for Study 1

The purpose of this study was to examine the role of hope and self-forgiveness in relation to Joiner’s (2005) IPTS model. The results confirmed the findings of previous research showing that perceived burdensomeness and thwarted belonging are associated with significant unique variance in suicidal ideation. The regression model including these elements of the IPTS explained 22% more variance in suicidal ideation than regression models containing only age, gender, ethnicity, marital status, and depressive symptoms.

The hypothesis that self-forgiveness moderates the relationship between perceived burdensomeness and suicidal ideation was also supported. The inclusion of self-forgiveness as a moderator of perceived burdensomeness resulted in a larger amount of variance in suicidal ideation accounted for in the model than the main effects of these variables alone. An analysis of the resulting beta coefficients indicates that the relationship between perceived burdensomeness and suicidal ideation differs based upon one’s ability to forgive one’s self. Holding all other variables constant, the final model would predict that in the presence of low levels of self-forgiveness (a score of 26 on the HFS-Self), an increase of 1.1 points in one’s INQ-PB score would be associated with a 23% increase on the GSIS-SI, whereas at high levels of self-forgiveness (a score of 36 on the HFS-Self), that same 1.1 point increase in one’s INQ-PB score would only be associated with a 1% increase on the GSIS-SI. Thus, one’s self-forgiveness may serve to buffer individuals from considering suicide in situations in which they perceive themselves to be a burden upon others.
The hypothesis that hope moderates the relationship between thwarted belonging and suicidal ideation was not supported. Hope was negatively correlated with suicidal ideation and other variables associated with suicidal ideation such as depressive symptoms, perceived burdensomeness, and thwarted belonging. However, neither the main effect of hope nor its interaction with thwarted belonging accounted for unique variance in suicidal ideation after controlling for demographic factors, depressive symptoms, and elements of the IPTS model. One possible interpretation of these findings is that the relationship between hope and suicidal ideation may be mediated by other factors. Similarly, hope may serve as a resilience factor to other suicide risk factors than those examined in this study. Another possibility is that the sample size (93) was insufficient to provide enough variance in suicidal ideation, hope, and thwarted belonging to model this effect.

Similarly, the hypothesis that hope would be positively correlated with acquired capability was not supported in this sample. While hope has been found to be correlated with acquired capability in previous studies (Davidson et al., 2009), the results of this study are not necessarily unexpected. One interpretation may be that this study was insufficiently powered to detect the small effect observed in other studies. The discrepant results may also be due to differences in the instruments used to measure hope. Davidson (2009) used the Revised Domain Specific Hope Scale (Shorey & Snyder, 2004), whereas we used the Hope Scale (Snyder et al., 1991). While these two scales measure conceptually similar constructs, one may expect substantial differences in the results when comparing instruments designed to measure state levels of a construct to ones designed to measure trait levels of a construct.

The current study has several significant limitations. The study sample was essentially racially and ethnically homogenous. The inclusion of a more diverse population would provide
additional evidence supporting the generalization of the results. Also, the sample size in the current study may not have been sufficient to detect moderation effects with hope, if they were present. Thus, a replication with a larger sample size was conducted to help determine if hope was misspecified in relation to the IPTS.

Additionally, it is worthwhile to examine the relationship between hope, self-forgiveness, and the IPTS in other samples. Older adults are at particular risk for dying by suicide, and population-specific research is beneficial in determining appropriate interventions for this age group. However, it would be valuable to determine if self-forgiveness serves as a resilience factor in relation to perceived burdensomeness in other age groups, such as young adults, for whom suicide is the third leading cause of death (CDC, 2012)
Chapter 5: Methods for Study 2

Participants

The second sample (n = 187) was drawn from undergraduate students enrolled in an Introductory Psychology class at the Ohio State University. All participants were over the age of 18 (M = 20, SD = 3.87). The sample was 39% female and predominantly Caucasian (74%), with 11% of individuals self-identifying as Black or African American, 10% identifying as Asian, 9% identifying as Hispanic or Latino, 2% identifying as Native Hawaiian or Pacific Islander, and 1% identifying as Native Alaskan or American Indian.

Measurement/Instrumentation

All of the measures used in the previous study, except the GSIS-SI, were retained for the current study. As the GSIS-SI is not appropriate for an undergraduate sample, the Personality Assessment Inventory- Suicidal Ideation Scale (PAI-SUI; Morey, 1991) was used as the measure of suicidal ideation. The PAI-SUI is a 12-item subscale of the PAI that is designed to assess suicidal ideation in adults. The PAI-SUI uses a 4-point Likert scale and was found to have good internal consistency with alpha coefficients ranging from .81 to .86 and two-month test-retest coefficients exceeding .83 (Morey, 1991). In this sample, the internal consistency of the PAI-SUI was adequate (α = .71).
Study Procedures

Participants were recruited by posting a brief description of the experiment to the department’s website offering course credit for their participation. Additionally, students were offered the opportunity at the beginning of the quarter to complete pre-screening measures for course credit. Students who completed the CES-D in prescreening and had a score 16 or above were preferentially recruited to increase variability in suicidal ideation. After providing written consent, participants completed all measures in a counter-balanced order on a computer in a private laboratory room. Participants typically required 30-45 minutes to complete all measures. Participant’s responses were reviewed for indications of current distress or suicide risk. A licensed psychologist was available to evaluate suicide risk and facilitate hospitalization, if appropriate, at all times. All participants were debriefed and provided information on the study aims, the national suicide prevention lifeline, and counseling services available through the university. In return for participating, participants received class credit.
Chapter 6: Results for Study 2

Data Analytic Plan and Preparation

Participants’ responses on the questionnaires were examined to identify unusual or inattentive patterns of responding. One participant was excluded due to having insufficient data to compute valid scores on one or more of the instruments in the analysis, producing a total sample of 186 participants. In preparation for the analysis, gender was dummy coded with the reference group being females. Race and ethnicity were dummy coded with the reference group being Caucasian individuals. Relationship status was dummy coded with the reference group being single. All variables were examined for potential outliers.

As before, the skewness and kurtosis of the variables and the regression residuals demonstrated violations of the assumptions of normality and homoscedasticity, indicating that the traditional significance tests presented below should be interpreted with caution. Additionally, two potential outliers were identified as having residuals greater than three standard deviations from their mean. Excluding these participants and re-running the analyses did not result in significant changes in the statistical tests or parameter estimates for the model, so the model presented below included all participants in the study.

Analysis

The means, standard deviations, and inter-correlations for each measure were calculated and are presented in Table 3. Participants’ CES-D, INQ-PB, INQ-TB, and PAI-SUI scores were
all found to be positively correlated, and negatively correlated with participants’ Hope and HFS-Self scores. In support of Hypothesis 1, the correlation between participants’ ACSS and Hope scores was positive and significant \((r = .17, p = .02)\). As hypothesized, higher ACSS scores were associated with higher Hope scores. Participant’s ACSS scores were also positively correlated with their PAI-SUI scores \((r = .19, p = .01)\), but not with any other measure (see Table 3).

As in Study 1, a hierarchical multiple regression procedure was used to test Hypotheses 2, 3 and 4. Variables were entered stepwise in a pre-specified order to determine if their inclusion significantly improved model fit when regressed upon participants’ PAI-SUI scores (See Table 4). The first step, including only demographic variables, was not statistically significant, adjusted \(R^2 = .01, F(4,182) = 1.42, p = .23\). The second model, including participants’ CES-D scores, was significant, adjusted \(R^2 = .29, F(5,181) = 16.20, p < .01\), and accounted for 29\% of the variance in participants’ PAI-SUI scores.

A third step, consisting of participants’ INQ-PB and INQ-TB scores, was evaluated to test Hypothesis 2. The model including the INQ-PB and INQ-TB scores was significant, adjusted \(R^2 = .44, F(7,179) = 21.71, p < 0.01\), accounting for an additional for 15\% of the variance in participants’ PAI-SUI scores and representing a significant improvement in model fit. Thus, Hypothesis 2 was supported, such that perceived burdensomeness and thwarted belonging were found to explain unique variance in suicidal ideation after controlling for depressive symptoms and several demographic factors.

The inclusion of the main effects of Hope and HFS-Self in a fourth step resulted in a significant model, adjusted \(R^2 = .50, F(9, 177) = 19.92, p < 0.01\), that accounted for an additional 4\% of the variance in PAI-SUI scores, and represented a significant improvement in model fit.
To test Hypothesis 3 and 4, a fifth step including the effects of the Hope by INQ-TB and the HFS-Self by INQ-PB interactions was computed. The model was significant, adjusted $R^2 = .55$, $F(11, 175) = 19.73, p < 0.01$, and resulted in a significant increase of 5% of the variance accounted for in participants’ PAI-SUI scores. An examination of the beta coefficient estimates for the final model indicated that being female was associated with higher scores on the PAI-SUI, whereas scores on the HFS-Self, the HFS-Self by INQ-PB interaction, and the Hope by INQ-TB interaction were associated with lower scores on the PAI-SUI. Thus, both Hypothesis 3 and Hypothesis 4 were supported in this study; the improvement in model fit and significant beta coefficients for both terms support the hypotheses that self-forgiveness moderates the relationship between perceived burdensomeness and suicidal ideation and that hope moderates the relationship between thwarted belonging and suicidal ideation.

Because there is evidence of the violation of the assumptions of classical significance testing in multiple regression, the same bootstrapping procedure described previously was used to construct 95% confidence intervals for the interaction between HFS-Self and INQ-PB and the interaction between Hope and INQ-TB. Resampling the dataset 1000 times with replacement, the resulting 95% confidence intervals for both the HFS-Self by INQ-PB interaction [-0.71, -0.22] and the Hope by INQ-TB interaction [-0.62, -0.01] both excluded zero. These results confirm that the interaction between HFS-Self and INQ-TB and between Hope and INQ-PB both explain unique variance in GSIS-SI total scores.

A simple slopes analysis was conducted to visualize the Hope by INQ-TB interaction (Figure 2) and the HFS-Self by INQ-PB interaction (Figure 3). The results indicate that, holding all other variables constant, increases in INQ-PB are associated with larger increases in estimated PAI-SUI scores for participants who score relatively low on the HFS-Self. In contrast, the
relationship between INQ-PB and the predicted PAI-SUI is much weaker for individuals with high scores on the HFS-Self. Similarly, increases in INQ-TB are associated with larger increases in estimated PAI-SUI scores in participants who scored relatively low on the Hope Scale, but had relatively little impact in the estimated PAI-SUI scores for individuals with relatively high Hope scores.
Chapter 7: Discussion for Study 2

The purpose of this second study was to confirm the results of the previous study in a larger, younger, and more diverse sample. Similar to the first study, Hypothesis 2 was supported. Perceived burdensomeness and thwarted belonging were associated with unique variance in suicidal ideation, and including these variables into the regression model accounted for 14% more variance in suicidal ideation than was accounted for by demographic factors and depressive symptoms alone.

The result of this study were consistent with the results of the previous study with regard to Hypothesis 3, such that self-forgiveness was found to moderate the relationship between perceived burdensomeness and suicidal ideation. Additionally, self-forgiveness was also observed to have a direct relation with suicidal ideation. Thus, self-forgiveness may function both as a resilience factor with regard to the relationship between perceived burdensomeness and suicidal ideation and more directly as a protective factor against suicidal ideation. One possible explanation is that low levels of self-forgiveness could be conceptualized as being similar to high levels of self-criticism or perfectionism, which has been shown to be associated with suicide risk (Flett, Madorsky, Hewitt, & Heisel, 2002).

A closer look at the simple slopes analysis reveals that one’s level of self-forgiveness has a significant impact on the relationship between perceived burdensomeness and suicidal ideation. Using the parameter estimates from the final model, in the presence of low levels of self-forgiveness (a score of 26 on the HFS-Self), a .75 point increase in one’s INQ-PB score would
be associated with a 26% increase on the PAI-SUI whereas at high levels of self-forgiveness (a score of 36 on the HFS-Self), that same .75 point increase in one’s INQ-PB score would only be associated with a 2% increase on the PAI-SUI.

Contrary to the previous study, Hypothesis 4 was supported such that hope was found to moderate the relationship between thwarted belonging and suicidal ideation. The inclusion of the main effect of hope did not significantly improve model fit, but the interaction term between hope and thwarted belonging increased model fit. Using the parameter estimates from the final model, at low levels of hope (a score of 45), a one point increase in one’s INQ-TB score corresponded with a 25% increase on the PAI-SUI whereas at high levels of hope (a score of 59), a one point increase in one’s INQ-TB score would only be associated with a 6% increase on the PAI-SUI. Thus, thwarted belonging is strongly associated with suicidal ideation in individuals with low levels of hope. Several explanations exist as to why this result was not found in the first study. As discussed above, the first study may have been underpowered, and thus the failure to reject the null hypothesis may have been due to type II error. It is also possible that the relationship between hope, thwarted belonging, and suicidal ideation differs in these separate age groups. Participants’ levels of hope and thwarted belonging did not significantly differ between samples, suggesting that differences may be due either to misspecification of the model or to differences in the variance in suicidal ideation captured by the GSIS-SI and the PAI-SUI.

Hypothesis 1, that there is a significant positive correlation between hope and acquired capability, was supported. As this estimate of the correlation coefficient is identical to that of the previous study, it can be inferred that there is a small correlation between hope and acquired capability, but that the previous study did not have sufficient power to detect it.
Chapter 8: General Discussion

This study was conducted to examine the interactions between hope, self-forgiveness, and the elements of the IPTS model. The results from this study were consistent with previous research, such that perceived burdensomeness and thwarted belonging explained unique variance in suicidal ideation, even after controlling for depressive symptoms, age, race or ethnicity, and relationship status. These components of the IPTS model appear to be particularly relevant to the desire to die by suicide, and may further our understanding and prediction of suicide risk.

Similarly, these studies replicated the previous finding that hope has a small, positive correlation with acquired capability. Hope is traditionally discussed as a protective factor against suicide, and acquired capability is typically considered a risk factor for suicide. While the acquired capability to die by suicide is particularly dangerous in individuals with suicidal intent, it may be harmless or even beneficial for individuals who do not have this desire. For example, the ability to tolerate pain and to overcome one’s instincts for self-preservation could be considered vital for first responders and soldiers in combat roles.

These studies also extend the existing work on the IPTS model to provide evidence that self-forgiveness moderates the relationship between perceived burdensomeness and suicidal ideation. The association between perceived burdensomeness and suicidal ideation was observed in these studies to be attenuated in both younger and older adults who had high levels of self-forgiveness. The perception that one is a burden upon others is often assumed to be the result of cognitive distortions (Joiner, 2005). However, there are frequently periods in which individuals
require substantial assistance from loved ones or society. Older adults may have to rely heavily upon others to meet their daily needs, and college students may still be financially and emotionally dependent upon their families. It is important to understand the cognitive processes that lead individuals to the conclusions that their loved ones, or society in general, would be better served by their death than by their further encumbrance. Having the ability to forgive one’s self for perceived transgressions appears to weaken the translation of that perception into the decision that suicide is a potential solution.

A similar result was found with regard to hope and the relationship between thwarted belonging and suicidal ideation in younger adults. As individuals transition through life roles and geographic locations, there are often periods in which their need for companionship and community are not met. Individuals with hope may have the confidence and skill of setting realistic goals, determining routes towards those goals, and having the agency to implement those pathways. Thus, individuals who have high levels of hope may perceive themselves to be isolated, but to consider this to be a more temporary condition that makes suicide appear to be a less viable solution. To the best of our knowledge, neither the findings regarding the moderating role of hope or self-forgiveness have been previously examined or reported within the literature.

Because self-forgiveness and hope function as moderators between components of the IPTS and suicidal ideation, they are consistent with Johnson et al.’s (2011) definition of a resilience factor. The consideration of both risk and resilience may be particularly relevant to refining our understanding of who is, and who is not, at risk for dying by suicide. Additionally, this research further highlights the potential value in augmenting the existing research on the isolated effects of psychological variables on suicidal ideation and behavior with studies examining how these factors interact in relation to theoretical models. While univariate studies
may often be necessary due to methodological constraints, suicide is a complex phenomenon, and it is likely that the effects of many variables that are correlated with suicide risk are actually due to their relationship with other variables more closely related to suicide. Our ability to accurately assess suicide risk will always be limited by the extent to which our theoretical and statistical models align with the processes that determine suicidal thoughts and behavior in nature.

Clinical Implications

The results of these studies are consistent with previous findings, such that the extent to which a client perceives himself or herself to be a burden upon others and the extent to which their need for belonging is chronically unmet are relevant with regard to suicidal ideation and risk. These studies extend these results, providing preliminary evidence that these factors are particularly relevant for individuals who do not have the ability to forgive themselves for their perceived transgressions against others, and who do not believe themselves able to find and implement strategies to ensure their need for connection will be met in the future. While hope, self-forgiveness, perceived burdensomeness, and suicidal ideation were associated with substantial variance in suicidal ideation, these variables are still less relevant to suicide risk than querying clients about suicidal ideation directly. However, clients may underreport suicidal ideation because of the stigma associated with mental illness, a risk that is particularly relevant in older adults. A client may feel more comfortable answering questions related to their perceived burdensomeness, thwarted belonging, hope, and self-forgiveness. Based upon the results of this study, a client who endorses high levels of risk factors and low levels of resilience factors while denying suicidal ideation may warrant additional assessment. Even if such a client does not
currently experience suicidal ideation, they may be at an increased risk of doing so in the future if exposed to additional stressors.

Additionally, a deeper understanding of the role of resilience factors in suicide risk may help refine clinicians’ abilities to accurately prescribe interventions based upon a client’s current needs. While an under-estimation of a client’s risk of suicide is undoubtedly the worst outcome in suicide risk assessments, there is also a substantial cost to over-estimation. Given the limited availability of mental health practitioners, the limited resources in many communities for hospitalization, and the detrimental effects on both the client and the therapeutic relationship from unnecessary hospitalizations, it is important to refine our evaluations of suicide risk whenever possible. While the results of these studies should be replicated before they are used to inform clinical practice, determining why the majority of people who are at an increased risk of suicide do not actually die by suicide may be just as important as determining why people do die by suicide when it comes to managing our limited resources and effectively serving our clients.

The results of these studies also have implications for the development of novel treatments to reduce suicide risk. The majority of known risk factors for suicide are either immutable (e.g., age, gender, or suicide behavior history) or are unlikely to change over the course of crisis-relevant time scales (e.g., severe psychopathology). However, perceived burdensomeness and thwarted belonging are both viewed to be constructs that are temporally variable and malleable (Van Orden, Talbot, & D. King, 2012), and may potentially be used as targets for clinical intervention (Joiner, Van Orden, Witte, & Rudd, 2009). Similarly, interventions have been designed to increase individuals’ hope (Cheavens et al., 2006; Klausner et al., 1998) and self-forgiveness (Harris et al., 2006; Lin, 2010).
Limitations and Future Directions

One of the most significant limitations of this study is its reliance upon non-clinical samples. While it is valuable to understand how suicidal ideation functions in the general population, the majority of the individuals in these studies reported that they do not experience significant suicidal ideation. Thus, an important extension of this study would be to replicate and extend it within a clinical sample experiencing high levels of suicidal ideation, as this is the population in which clinical risk assessments are most commonly conducted.

Similarly, while this study was focused on understanding factors related to suicidal ideation, it does not necessarily follow that the results would be applicable to one’s risk of dying by suicide. The majority of the individuals who think about suicide do not attempt it, and the majority of those who attempt suicide do not die by suicide (APA, 2003). While suicidal ideation and desire could be considered a prerequisite for a suicide attempt, research on suicidal ideation does not relieve the necessity of verifying its link with actual suicidal behavior (Friedman et al., 2005). Furthermore, because both studies were cross-sectional, no causal inference can be made as to the direction of the associations between suicidal ideation, perceived burdensomeness, thwarted belonging, hope, and self-forgiveness. It is possible that distress associated with psychopathology, suicidal ideation, perceiving one’s self to be a burden, and being chronically isolated may serve to lower levels of self-forgiveness and hope in these individuals over time.

Another limitation of these studies is the inclusion of too few racial and ethnic minorities to determine if the statistical model evaluated in these studies would hold in specific minority populations. The extent to which individuals are incorporated into the surrounding community, and their obligations toward others in that community, vary widely between cultures, and thus it
could be expected that the extent to which perceived burdensomeness, thwarted belonging, hope, and self-forgiveness are related to suicidal ideation may also vary across cultures. Along these lines, Hirsch, Visser, Chang, and Jeglic (2012) have found racial and ethnic differences in the relationship between hope, depression, and suicidal behavior. While the samples in the current studies covered an extremely large age range, it could also be valuable to verify that the relationships observed in the current study hold within a middle age or child population, and if the null finding with regard to hope’s role as a resilience factor in older adults was due to differences in the relationship between these constructs based upon age or a simple lack of power within the original study.

Another important extension of this study would be to examine the relationship between other risk and resilience factors and the elements assessed in the current studies. It is likely that other constructs that have been linked to suicide risk, such as optimism (Rasmussen, 2006), may be relevant to the IPTS model. While there are a near infinite number of possible interaction terms between suicide risk factors and resilience factors that could be evaluated, a judicious examination of plausible theoretical relationships would help to map out the complicated phenomenon of suicide, and to provide clinicians additional direction in their attempts to integrate information to accurately predict and mitigate suicide risk.

In conclusion, these studies were conducted to determine the relationship between hope, self-forgiveness, and components of the IPTS model. Hope and acquired capability were found in this study to be weakly but positively correlated, hope was found to moderate the relationship between thwarted belonging and suicidal ideation in younger adults, and self-forgiveness was found to moderate the relationship between perceived burdensomeness and suicidal ideation in both younger and older adults. In particular, the presence of self-forgiveness and hope was
associated with resilience against experiencing suicidal ideation in the presence of perceived burdensomeness and thwarted belonging. The discovery of significant relationships between risk and protective factors that had previously been studied in isolation highlights the complex nature of the phenomenon of suicide, and the necessity of improving our capacity to effectively integrate clinical information in the accurate assessment of suicide risk.
References


Brenner, L. A., Gutierrez, P. M., Cornette, M. M., Betthauser, L. M., Bahraini, N., & Staves, P.


Chang, R. (2010). *Interpersonal factors and suicidal ideation in Asian American college*


Davidson, C. L., Wingate, L. R., Rasmussen, K. A., & Slish, M. L. (2009). Hope as a predictor


Appendix A: Tables
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**Note:** *p < .05, **p < .01.

**Table 1: Correlations, Means, and Standard Deviations for Study 1**

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Table 2. Summary of Hierarchical Multiple Regression Analysis in Study 1

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Note: All beta coefficient estimates presented are from the final model (Step 5).
Table 3: Correlations, Means, and Standard Deviations for Study 2

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M    2.96  11.08  1.56  1.89  44.90  31.72  52.05
SD   3.32  8.12  0.75  0.98  12.27  5.72  7.28

Note: *p < .05, **p < .01.
Table 4. Summary of Hierarchical Multiple Regression Analysis in Study 2

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Note: All beta coefficient estimates presented are from the final model (Step 5).
Appendix B: Figures
Figure 1. Simple Slopes Analysis of the Self-Forgiveness by Perceived Burdensomeness Interaction in Study 1.
Figure 2. Simple Slopes Analysis of the Self-Forgiveness by Perceived Burdensomeness Interaction in Study 2.
Figure 3. Simple Slopes Analysis of the Hope by Thwarted Belonging Interaction in Study 2.