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Suicide in Younger and Older Adults : A Comparison of Two Theoretical Models for Suicide

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SUICIDE IN YOUNGER AND OLDER ADULTS: A COMPARISON OF TWO THEORETICAL MODELS FOR SUICIDE

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Abstract

SUICIDE IN YOUNGER AND OLDER ADULTS: A COMPARISON OF TWO THEORETICAL MODELS FOR SUICIDE

by John F. Gunn III

Suicide is a major public health concern claiming over 47,000 lives annually in the United States. Despite efforts at prevention, the rates of suicide have continued to climb. Due to this, research that can shed light on the potential causes of suicidal thoughts is of great importance. The present manuscript outlines three studies exploring two theoretical frameworks for suicide: (1) Interpersonal-Psychological Theory of Suicide (IPTS) and (2) Social Pain Model (SPM). Findings from Study 1 partially support the role of low self-worth and low social support in increasing risk for reporting suicidal thoughts in a racially diverse sample of African American and European American adolescents. Additionally, perceptions of racial discrimination were seen to interact with self-worth to lead to increased risk of suicidal thoughts. Studies 2 and 3 explored the SPM and found partial support for the model among young adults (Study 2) and middle to older adults (Study 3). In both studies, perceived burdensomeness had a direct effect on psychological pain. Psychological pain was, in turn, found to impact suicidal thoughts, though the nature of this relationship varied by study. In Study 2, psychological pain indirectly increased suicidal thoughts through an association with hopelessness, as predicted by the SPM. In Study 3 psychological pain lead directly to increased suicidal thoughts. Results from these three studies point to the importance of considering perceptions of self-worth, burdensomeness, and racial discrimination when seeking to understand and prevent suicide.

Keywords: Interpersonal-Psychological Theory of Suicide, Social Pain Model, perceived burdensomeness, perceptions of racial discrimination, thwarted belongingness.

Acknowledgements

"…the mind is not a vessel that needs filling, but wood that needs igniting..."

- Plutarch, *On Listening to Lectures*

I have always liked the analogy above, of the mind not being a vessel to fill but a fire to ignite. One thing that I can confidently say about those who have influenced me over my education is that they were always people who were passionate about the work they did. The wonderful thing about being passionate about the work you do, is that it is transmittable. An ember from the flame is passed from one to another, igniting in them the passion for their own work. I have been lucky to have known faculty members like this throughout my time as a student and I can only hope that I ignite in my future students that same passion. Keeping in mind all the work these individuals have done, it is important that they are acknowledged in this work.

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but in engaging me as a colleague from the start. That level of respect and care was humbling. Amidst the constant barrage of the imposter syndrome all graduate students face, Dr. Gager's encouragement and cheerleading was a constant source of relief. Dr. Amanda Birnbaum's agreement to join my qualifying committee, despite being from a different department, will always be one of the moments I look back on fortuitously. It was the making of a truly wonderful committee. Dr. Birnbaum's public health perspective forced me to view suicide from a lens I had not previously used. Due to this, I have grown as a researcher and a person. Her support through the final stages of my education has been immeasurable.

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a person more dedicated to others and it is contagious sort of decency I am glad to say she has spread to me and inevitably to our son. My son Frank is, without a doubt, the best thing that has ever happened to me. His presence in my life alters it daily. In his three years of life he has taught me more about myself than I had learned in my 28 years prior to him. When the chaos and stress of graduate education seemed to be closing in around me, his presence in my life kept all things in perspective. There is no greater motivator to do good than the desire to have your children proud of you. My father, John F. Gunn Jr., and my mother, Patty Gunn, provided me with a warm and loving home. They guided me through childhood to adulthood in a way only caring and loving parents can. They provided for me both in terms of financial and material support as well as in the emotional support that is so important to a child's sense of autonomy and well-being.

Finally, I want to acknowledge those that the world has lost to suicide and the desperate need to continue to pursue an understanding of this devastating phenomenon. When I first began on the road to becoming a suicide researcher a little over 12 in 100,000 persons died annually in the United States. Now the rate has reached 14.5 per 100,000 annually and is likely to be even higher at the next release of statistics. Lives are being lost and we owe it to them and to those they leave behind to do better

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Chapter 1

Introduction

I. Statement of the Problem

In 2017, 47,173 people died by suicide in the United States at a rate of 14.5 persons for every 100,000 (CDC, 2018). These rates vary significantly when age, race, and gender are taken into account. For example, suicide is the 1st leading cause of death for American Indian/Alaska Native females ages 10-14 years, Asian American/Pacific Islander males and females ages 15-19 years, and Asian American/Pacific Islander females ages 20-24 years. Suicide is the second leading cause of death for White, non-Hispanic males and females between the ages of 10 and 34 years and for White, non-Hispanic males ages 35-39 years, American Indian/Alaska Native males ages 10-14 years, American Indian/Alaska Native males and females between the ages of 15 and 34 years, American Indian/Alaska Native males ages 35-39 years, Asian American/Pacific Islander males 10-14 years and 20-34 years, and Hispanic females ages 15-24 years and males 35-39 years (CDC, 2018). Among African Americans, suicide is the 3rd leading cause of death for males and females aged 15-24 years and for males 25-29 years. For these populations' homicide is the second leading cause of death, nudging suicide to the third leading cause of death (CDC, 2018).

Although more than 47,000 persons die by suicide in the United States annually, the impact of suicide extends even beyond those deaths. For every death by suicide it is conservatively estimated that 6 persons become *loss survivors* (i.e., experience a major life disruption associated with the suicide). A recent random sampling of residents in Kentucky

found that almost 50% of those surveyed were exposed to (i.e., personally knew the decedent) one or more suicides (Cerel, McIntosh, Neimeyer, Maple, & Marshall, 2014; Cerel, Maple, van de Venne, Moore, Flaherty, & Brown, 2016). Based on this estimate, by the close of 2016 approximately 269,790 persons experienced the loss of another to death by suicide. Suicide bereavement has been linked to increased risk of experiencing complicated grief as well as an increased risk of suicide attempt (Pitman, Osborn, Rantell, & King, 2016). Jordan (2001) assessed the impact of suicide bereavement on grieving and concluded that grieving loss from suicide differed from other forms of loss in the (1) thematic content of the grief, (2) social processes surrounding the survivor, and (3) impact of suicide on family systems. The thematic content of grief by suicide involves difficulties in meaning making following the death, greater levels of guilt, blame, and feelings of responsibility for the death, and greater feelings of rejection or abandonment and the anger that accompanies this (Jordan, 2001). The social processes surrounding suicide, namely the stigmatization of the behavior, leads to difficulties in grieving and often serve as a barrier to others aiding in the grieving process (Jordan, 2001). Finally, there is evidence that greater family dysfunction (such as maternal depression, self-reported emotional distance, conflict, and cohesion) occurs with death by suicide as compared with families bereaved by other means (such as illness), though it is less clear if this is as a result of the death by suicide or a pre-existing risk factor for death by suicide (Jordan, 2001).

In addition to the lives lost and the detrimental impact on those bereaved by suicide, there are also economic impacts of suicide to consider. Examining the economic impact of suicide on society in Ireland, Kennelly (2007) estimated that over 906 million Euro ($1,038,806,010, US) was lost to suicide in 2001 and over 835 million Euro ($947,512,075, US) in 2002, representing around 1% of the gross national product in Ireland. These statistics are produced by estimating

the indirect costs of suicide, such as lost productivity through earnings over the remaining course of the individuals' life, taking into account the impact of mental illness on salary and productivity (i.e., missing more days and having days affected by severity of their illness). The direct costs of suicide have also been assessed; these include emergency medical services, funeral expenses, and administrative costs incurred through insurance claims and police investigations into the deaths. Clayton and Barcelo (1999) estimated the economic cost of suicide in New Brunswick, Canada for the year 1996. In 1996 there were 94 suicides. Direct costs (such as police investigations, autopsies, funerals) were estimated at over $500,000 ($381,700, US) while the total indirect costs (such as loss of productivity) was over $79,000,000 ($60,308,600, US) coming to a combined loss of almost $850,000,000 ($648,890,000, US). Focusing on the United States, Shepard and colleagues (2016) estimated that, based solely on reported numbers of suicide deaths and attempts, the economic cost for 2013 was $58,400,000,000. After adjusting for under-reporting on suicide deaths and attempts they estimated the cost to be closer to $93.5 billion. However, one challenge to these findings was the work by Yang and Lester (2007), which argued that the economic costs of suicide fail to consider the cost gained by psychological treatments not being implemented, social security and pensions not being paid out, and nursing home care costs. Yang and Lester (2007) argue that suicide should be prevented for humane reasons and not out of consideration of economic costs.

Although death by suicide accounts for a significant portion of mortality, non-fatal suicidal behavior occurs at a vastly higher rate. In the United States alone, there were an estimated 1,179,325 non-fatal suicide attempts in 2017 (Drapeau & McIntosh, 2018). This is a ratio of 25 attempts to every one death by suicide. Those aged 15 to 24 years of age, however, have a rate of 100 (and potentially higher) attempts for every one death by suicide (Drapeau &

McIntosh, 2018). The attempt to death ratio for those aged 15 to 24 years is therefore at least four times that of the general population, placing this age group as the most at-risk for non-fatal suicidal behavior. This means that for the 6,252 deaths by suicide among those 15-24 years in 2017 there were approximately 625,200 attempts. Thus, individuals aged 15 to 24 years enact more than half the suicide attempts in the United States each year (Drapeau & McIntosh, 2018).

Given the loss of life, the adverse effects of suicide on those bereaved, and, to a lesser extent, the economic costs of suicide on society, efforts to better understand predictors of suicidal thoughts and behaviors is can have wide-spread implications. The present proposal outlines three studies that examine theoretically linked risk factors for suicide across various developmental stages. The aim is to test two theoretical models of suicidal behavior, one that has been supported by prior research and another that has been recently proposed. These models, the Interpersonal-Psychological Theory of Suicide (IPTS) and the Social Pain Model (SPM), will be discussed in greater detail below. These studies will test the impact of risk-factors for suicide linked to these two theoretical models in three distinct samples: (1) a cross-sectional sample of college-attending young adults, (2) a national cross-sectional sample of older adults, and (3) a longitudinal sample of predominantly African American and European American young adults. These risk factors center on the key component of both theoretical models: the social nature of *homo sapiens*.

II. Theoretical Frameworks Guiding Research

The three studies being proposed are based in two theoretical models that center on psychological explanations for the development of suicidal thoughts and behaviors. The IPTS model was first proposed by Joiner (2005) and subsequently expanded upon by Van Orden and colleagues (2010), while the SPM was recently proposed by Gunn (2017). Both models view

human sociality as a major contributing factor in the development of suicidal thoughts and behaviors.

Interpersonal-Psychological Model of Suicide (IPTS). The IPTS was first proposed by Joiner (2005). Joiner (2005) proposed that suicide results from the co-occurrence of three risk factors: thwarted belonging, perceived burdensomeness, and the acquired capability for suicide. Thwarted belonging refers to perceptions by the individual that they have lowered social connectedness, that they do not fit in with society, or that they have few strong social bonds (e.g., "I am alone" or "Nobody cares about me"). Perceived burdensomeness refers to the belief that one is a burden on those around them and that they would be better off without them and is generally viewed as a lowered sense of self-worth (e.g., "They would be better off without me" or "I'm worth more dead than alive"). Thwarted belonging and perceived burdensomeness comprise the motivational element of suicide and lead to the development of suicidal thoughts.

However, these constructs are not sufficient by themselves to account for suicidal behavior and death by suicide. Joiner (2005) postulates that presence of thwarted belonging and perceived burdensomeness only leads to suicidal behaviors and death by suicide when they occur alongside the acquired capability for suicide. The acquired capability for suicide speaks to the inherent difficulties in enacting lethal self-injury. Suicide is physiologically difficult (e.g., if engaging in cutting behavior, wounds clot which requires the wounds to be repeatedly re-opened to cause death) as well as emotionally difficult (e.g., our inherent fear of pain and death). Due to these difficulties, Joiner (2005) argues that only when an individual has become habituated to the emotional and physical difficulties (e.g., through repeated exposure to painful experiences such as self-injury, sexual/physical abuse, or interpersonal violence) of suicide can they effectively

enact lethal self-injury. According to the IPTS model only in the presence of all three factors is lethal suicidal behavior likely to occur (Joiner, 2005).

Van Orden and colleagues (2010) later expanded upon the original formulation of the IPTS model, better defining the pathways by which perceived burdensomeness and thwarted belonging lead to suicidal thoughts and the transition to behaviors while considering other established risk factors for suicide. The new model abandons the previous three-circle model of the IPTS for a path diagram which incorporates previously supported risk factors for suicide. For example, under the new model thwarted belonging and perceived burdensomeness are hypothesized to lead to the development of hopelessness. Hopelessness, in turn, leads to the development of the desire for suicide (Van Orden et al., 2010). Hopelessness was first proposed as contributing to suicidal behavior by Aaron Beck and colleagues (Minkoff, Bergman, Beck, & Beck, 1973; Beck, Weissman, Lester, & Trexler, 1974) and has held up well to empirical scrutiny (McMillan, Gilbody, Beresford, & Neilly, 2007; Victor & Klonsky, 2014).

In addition to incorporating hopelessness, the updated model by Van Orden and colleagues (2010) expanded upon the definitions of the original three constructs (thwarted belonging, perceived burdensomeness, and the acquired capability) thereby making the operationalization of these constructs more tangible. Thwarted belonging can be broken into two elements: loneliness ("I feel disconnected from others") and the absence of reciprocal care ("I have no one to turn to" and "I don't support others"). Van Orden and colleagues (2010) place several protective and risk factors that have been linked to suicide within one of these two characteristics of thwarted belonging. Loneliness can be tied to risk factors such as seasonal variation in suicidal thoughts and behaviors (e.g., the peak in suicides during spring-time, the lowering of rates during the winter holiday season), living alone, having few social supports, or

coming from a non-intact family (e.g., parental separations, single-parenthood) or to protective factors such as pulling together effects (such as when sports team victories occur), caring letter initiatives (i.e., postcards sent to those admitted to an E.R. following a suicide attempt a period of time after a discharge), and marriage, children, and friends (Van Orden et al., 2010). The absence of reciprocal care can be linked to risk factors such as social withdrawal, single jail cell occupancy, domestic violence, interpersonal loss through death or divorce, childhood abuse, and family conflict (Van Orden et al., 2010). Of importance to this proposal is the relationship between thwarted belonging and social supports, such as family, friends, school, and societal acceptance, as well as self-reported loneliness.

Perceived burdensomeness was further defined through the constructs of liability ("My death is worth more than my life to others") and self-hate ("I hate myself'). Van Orden and colleagues argue that liability can be linked to risk factors for suicide such as distress from homelessness, distress from incarceration, distress from unemployment, distress from physical illness, feelings of expendability, feelings of being unwanted, and the belief that one is a burden on family or others (Van Orden et al., 2010). Further, self-hate can be linked to risk factors such low self-esteem, self-blame, shame, and agitation (Van Orden et al., 2010). Of importance to the proposed study are the concepts of burdensomeness to family, low evaluations of self-esteem, and evaluations of self-worth.

Expanding on the original formation by Joiner (2005), the acquired capability for suicide was also further refined by Van Orden and colleagues (2010) into a lowered fear of death and increased physical pain tolerance. Van Orden and colleagues (2010) linked these elements to several risk factors that have appeared in the literature. Risk factors that can be linked to the acquired capability include impulsivity, exposure to suicidality/clustering, combat exposure,

previous suicide attempts, and childhood maltreatment (Van Orden et al., 2010). This updated model lead to several hypotheses related to suicidal thoughts and behaviors proposed by Van Orden and colleagues (2010):

- H1: Thwarted belonging and perceived burdensomeness on their own can lead to the development of passive suicidal ideation ("I wish I were dead").
- H2: The relationship between Thwarted Belonging and Perceived Burdensomeness and the desire for suicide ("I want to kill myself") will be mediated by hopelessness.
- H3: A lowered fear of death will moderate the relationship between desire for suicide and suicidal intent.
- H4: Increased pain tolerance will moderate the relationship between suicide intent and lethal/near-lethal suicidal behavior.

Support for the IPTS. Support for both iterations of the IPTS has been established in the literature. Joiner and colleagues (2002) compared suicide notes written by those who made a non-lethal suicide attempt and those who died by suicide. Comparisons between the two groups revealed that perceived burdensomeness was present more often and to a greater degree in the notes of fatal suicides. Additionally, perceived burdensomeness was associated with the lethality of the method used, providing some support for the proposed relationship between perceived burdensomeness and the acquired capability proposed by the IPTS model (Joiner et al., 2002). Van Orden and colleagues (2006) found that, among outpatients at a university psychological clinic, perceived burdensomeness was predictive of suicidal thoughts and behaviors even when hopelessness was statistically controlled.

Joiner and colleagues (2009) examined the full model using two samples of young adults. The first sample was a subsample drawn from a larger longitudinal study of middle school students while the second samples consisted of high-risk participants drawn from two outpatient clinics and an emergency room associated with a US Army medical center. The findings supported the model. Perceived burdensomeness and thwarted belongingness contributed significantly to the prediction of suicidal thoughts, and the three-way interaction of thwarted belongingness, perceived burdensomeness, and the acquired capability for suicide significantly predicting current suicide attempt status. Those most likely to engage in present suicide attempt behavior were those who had multiple past attempts (used to gauge the acquired capability) when they perceived themselves as having low belonging and to be a burden. Those who had only a single attempt or no attempt in the past still showed elevated suicidal thoughts and behaviors, but stronger effects were found for those with multiple attempt histories. Bryan, Clemans, and Hernandez (2012) also examined the full model utilizing a sample comprised of deployed military personnel. Findings supported the role of perceived burdensomeness, fearlessness of death, and their interaction in the prediction of suicidal thoughts and behaviors but failed to support the role of thwarted belongingness (Bryan et al., 2012).

More recently, Ma and colleagues (2016) systematically reviewed the literature on the IPTS and found mixed support for the model. They concluded that there was strong evidence for the relationship between perceived burdensomeness and suicidal thoughts. However, there were a number of studies that failed to find support for the role of thwarted belongingness in suicidal thoughts and behaviors (Ma et al., 2016). Chu and colleagues (2017) performed a meta-analysis on quantitative research into the IPTS model. Their findings were far more supportive of the IPTS model, with overall findings supporting the model in full. One potential explanation for

the contradiction in findings is the larger sample size of studies collected by Chu and colleagues (2017). Additionally, Chu and colleagues utilized meta-analytical techniques to examine the literature statistically, as opposed to the systematic narrative review techniques exercised by Ma and colleagues (2016).

The Social Pain Model of Suicide (SPM). The SPM of suicide postulates that suicide is a byproduct of our evolutionary adaptation of pain aversion (Gunn, 2017). Specifically, the experience of social pain leads to an aversive state. Individuals are motivated to escape from this unpleasant stimulus. In this conceptualization, negative social experiences such as ostracism and social exclusion coupled with suicidogenic cognitions, such as perceived burdensomeness and thwarted belonging, lead to a negative emotional state and the experience of social pain. The transition from experiences of social pain and suicidal behavior is then moderated (i.e., the likelihood of transitioning to behavior will be increased or decreased) by the presence of the acquired capability for suicide (Gunn, 2017).

Recently, through discussion with colleagues and further examination of the literature, the SPM model has been updated to be more consistent with empirical findings in the field (Gunn, 2019). This updated version of the SPM model can be seen in Figure 1. Under the new formulation of the model, pain is experienced and triggered by both physical and social triggers. According to the model, while pain can originate due to physical conditions, it is social pain that is ultimately the greater contributing force in suicidal behavior and there is interplay between the experience of both social and physical pain triggers. For example, although a physically painful condition (e.g., chronic pain) may lead to the motivation to escape the pain, it will also likely lead to the experience of social pain triggers, such as perceptions of burdensomeness or a sense

of defeat. One proposal that emerges from this model is that, while suicide may often occur when only social pain is present, it will rarely occur with only physical pain present.

Once pain is experienced, the individual desires to avoid or escape the pain (i.e., pain aversion; Gunn, 2017; Gunn, 2019). This, the SPM argues, is the dominant motivational force behind suicidal thoughts and behaviors. However, it is not enough that one is motivated to escape from pain for suicidal thoughts to develop, but rather one must also perceive limited escape potential. It is the belief that one cannot escape from the pain and that things are not likely to change that causes the development of suicidal thoughts. Should one experience pain but see a way out of the pain, it is highly unlikely that suicide would occur. For example, seeking treatment for dealing with emotional pain may be one avenue used to escape the pain or turning to substance use/abuse may be another. Some methods for escaping the pain may be more conducive to recovery than others. Seeking out treatment may lead to recovery, whereas abusing substances (such as alcohol or opiates) will likely exacerbate the problem in a multitude of ways. Once suicidal thoughts have developed the progression from suicidal thoughts to behaviors, the SPM predicts a similar process to that proposed by Joiner (2005) and Van Orden and colleagues (2010). The transition from thoughts to behaviors is mediated by the presence capability which include (1) fearlessness of death, (2) increased pain tolerance, and (3) access to means/methods (e.g., firearms).

There are several hypotheses that were subsequently proposed by Gunn (2017; 2019):

- H1: Suicidal thoughts and behaviors will be associated with psychological pain, as it is this pain that is the motivational force behind suicidal thoughts and behaviors.

- H2: Triggers of social pain (e.g., perceived burdensomeness) and physical pain that have previously been linked to suicidal thoughts and behaviors will be predictive of psychological pain.
- H3: The prediction of suicidal thoughts from psychological pain will be fully mediated by the individual's perceptions of escape potential (i.e., how likely is it that they can escape the pain via other means).
- H4: The association between suicidal thoughts and suicidal behaviors will be, at least partially, mediated by the acquired capability for suicide.

Support for the SPM. Unlike the IPTS, the SPM has yet to undergo empirical examination and, as such, does not have a body of literature supporting it. However, the SPM draws heavily from previous models of suicidal behavior that have been empirically supported. Baumeister (1990) proposed that suicidal behavior was the result of the need to escape from negative emotional states brought on by negative self-awareness. The pain associated with this negative self-awareness is the motivational force behind suicide in Baumeister's model, just as the pain associated with negative social appraisals is the prime motivator in the SPM. This negative self-awareness in turn is brought about by the failure to meet expectations, often which are tied to social settings (e.g., failure to make professional gains, failure to succeed academically). Baumeister further emphasizes the importance of intimacy and the break-up in social relations that often characterizes suicides. Persons who die by suicide believe their circumstances fall short of some standard, set either by the individual or by significant persons in their lives. These standards are typically unrealistically high or exacerbated by stressful life events (Baumeister, 1990). Due to these circumstances, the individual then attributes negative characteristics to the self. Those who die by suicide, according to Baumeister, then develop a

high self-awareness of the self as being undesirable or inadequate in some way which in turn leads to the development of a negative affect state. This negative state leads to several cognitive deficits (such as disinhibition and irrational thoughts) which winnow away at restraints against suicide and ultimately lead to an attempt at suicide as a means of escape from the negative affect. There is significant overlap between the SPM and Baumeister's view of suicide as escape from negative self-awareness. Both view suicide as motivated by the desire to escape negative states and both focus on cognitive states, such as hopelessness and perceptions of being trapped, as contributing to the development of suicidal thoughts. Where they diverge is in considerations of non-psychological contributors to suicidal thoughts and behaviors, such as physical pain, the acquired capability for suicide, and access to means which contribute to death by suicide as well as in the consideration of the evolutionary origins of suicide.

Dean and Range (1999) tested Baumeister's escape theory using an outpatient sample with a mean age of 35.5 years. Testing the path model of the theory, they found that measures of perfectionism (used as a proxy to measure unrealistically high expectations) predicted depression which in turn predicted hopelessness. Hopelessness was predictive of suicidal thoughts and was also predictive of reasons for living, which in turn predicted suicidal thoughts. Of importance with the finding was that hopelessness was predictive of suicidal thoughts, one of the postulates of the SPM. More recently, Campos and Holden (2015) examined the relationship between parental rejection, depression, interpersonal needs (perceived burdensomeness and thwarted belonging), psychological pain, and suicide risk in a convenience sample drawn in various regions of Portugal. Participants ranged in age between 18 and 65 with an average age of 37.86 years. Parental rejection was directly associated with suicide risk (attempt status, thoughts, communication, and likelihood of engaging in behavior in future) as well as indirectly via

interpersonal needs and depression. Depression was indirectly associated with suicide risk through interpersonal needs and psychological pain. Interpersonal needs had a direct association with suicide risk as well as an indirect association through psychological pain. Psychological pain was also directly associated with suicide risk (Campos & Holden, 2015). These results suggest that, even when interpersonal needs and depression are considered, psychological pain will still contribute to the development of suicide risk. However, the finding that interpersonal needs had both a direct and indirect effect on suicide risk is counter to the proposition put forward by the SPM.

Verrocchio and colleagues (2016) in systematically reviewing research focused on the link between mental pain and suicidal thoughts and behaviors, found that there is substantial support for mental pain as a core factor in suicidal thoughts and behaviors both independently as well as in conjunction with depression. Psychological pain has also been shown to fully mediate the relationship between suicidal thoughts and the frequency (in the past week) of psychological symptoms as well as partially mediating the relationship between suicidal thoughts and the intensity of those symptoms (Campos et al., 2017). These findings highlight the important role of psychological pain in suicidal thoughts, the prime motivator to suicide in the SPM. Levi-Belz, and colleagues (2014) examined the role of psychological pain in the suicidal behavior of those making medically serious suicide attempts compared to those making non-medically serious suicide attempts and psychiatric controls. The sample of 336 participants were divided into four groups: 78 participants assigned to the medically serious suicide attempt group, 116 in the medically non-serious suicide attempt group, 95 health controls, and 47 psychiatric controls. Findings supported the role of psychological pain in those making a suicide attempt. Most important to the SPM, those who made medically serious attempts were more likely to view their

pain as irreversible. This finding is in line with the SPM's focus on escape potential in mediating the path from suicidal thoughts to suicidal behaviors. Finally, Montemarano and colleagues (2018), using a 4-year follow-up design, examined the role of psychological pain in the prediction of suicidal thoughts among undergraduate college students at increased risk for suicide. Psychological pain was the only significant predictor of suicidal thoughts at baseline and at follow-up when entered into the regression alongside hopelessness and depression.

Limitations. There are a number of limitations in the research on the models discussed above. One of the goals of the current dissertation is to address some of these limitations. First, most of the research into the IPTS model is cross-sectional (over 93%, Chu et al., 2017). Thus, there is a lack of available data on factors that predict suicidal thoughts and behaviors over time. Second, the samples typically examined are young to middle aged adults, with less research done on younger and older populations. Unfortunately, then, much less is known about factors that predict suicide in the "emerging adult" age group (those that are transitioning to adulthood approximately aged 18 to 25; Arnett, 2000) or among older adults. Additional data on these age groups is urgent, given the prominence of suicide as a cause of mortality in these populations (CDC, 2018). Additionally, emerging adults constitute a population at even greater risk of engaging in non-fatal suicidal behavior (Drapeau & McIntosh, 2018). Third, more work is needed on diverse samples, as more than half of the studies examined were made up of European American participants (over 63%, Chu et al., 2017). This is a clear limitation given that suicide rates among racial minorities, such as African American youths, have been on the rise (Bridge, Horowitz, Fontanella, Sheftall, Greenhouse, Kelleher, & Camp 2018) and racial minorities face unique stressors to suicide, such as racial discrimination (Walker, Francis, Brody, Simons, Cutrona, & Gibbons, 2017). Research into psychological pain and suicide has many of these

same limitations. Although previous work has examined psychological pain, the theoretical framework proposed by Gunn (2017) and its accompanying postulates have not yet been examined. Given this, the focus of this dissertation is to examine the role of negative social perceptions on the development of suicidal thoughts and behaviors. To this end, three studies are proposed that touch upon two theoretical models of suicidal behavior the SPM and IPTS. Each study is discussed in further detail below. The first study utilizes a diverse sample of college students to compare the IPTS and SPM models on the prediction of suicidal thoughts and behaviors. The second study uses a large pre-existing dataset, the Midlife in the United States (MIDUS; PI: Carol Ryff), to examine the IPTS and SPM models among older adults (65+). Finally, study 3 utilizes the two final waves of the Maryland Adolescent Development in Context Study (MADICS; PIs: Jacquelynne S. Eccles & Arnold J. Sameroff), which is a large, longitudinal study following adolescents and their families from grade 7 through 3-years after high school, to explore longitudinal relations among self-worth, social support, perceived discrimination, and suicidal thoughts among African Americans and European Americans during the transition to adulthood. Greater details concerning each of these studies will be provided below.

Chapter II: Literature Review

The theoretical models discussed in Chapter 1 highlight several key factors in the development of suicidal thoughts and behaviors. The three studies outlined in this manuscript examine these factors in three distinct samples covering two developmental periods: young adulthood and middle to older adulthood. This next section will include a more detailed discussion of risk factors of suicidal thought and behavior, focusing on the role of the following constructs: (1) psychological pain, (2) hopelessness, (3) perceived burdensomeness, (4) thwarted

belongingness, (5) racial discrimination, and (6) relational and physical violence. All these factors have been previously linked to suicidal thoughts and behaviors in past research and are central to the present studies.

I. Psychological Pain & Suicidal Thoughts & Behaviors

Psychological pain is the primary motivator in escape theories of suicide (Gunn, 2014), such as those proposed by Shneidman (1993; 2005) and Gunn (2017). In a systematic review of the literature, Verrocchio and colleagues (2016) concluded that psychological pain is a core clinical feature of those experiencing suicidal thoughts and behaviors. Moreover, these authors assert that psychological pain is a characteristic of suicidal thoughts and behaviors both in conjunction with depression as well as independent of depression. Reist and colleagues (2017) explored the role of psychological pain in suicidal thoughts and behaviors among US military veterans. Findings supported the role of psychological pain, which was a significant predictor of suicidal thoughts and behaviors and which accounted for the most variance even with impulsivity, depressive symptoms, and hopelessness considered. Work by Xie and colleagues (2014) comparing depressed patients seeking outpatient care with participants serving as controls, characterized the suicidal mind as one motivated by (1) decreased seeking out of experiences of hedonia (pleasure, cheerfulness) as opposed to the anhedonia (inability to feel pleasure) associated with depression and (2) increased motivation to avoid pain. In other words, those who were suicidal were distinguished from those who were depressed but not suicidal by their lack of interest in seeking out pleasurable and cheerful experiences and by their increased desire to avoid pain.

Examining the role of psychological pain alongside impulsivity, Caceda and colleagues (2014) found that psychological pain and impulsivity were characteristic of both suicide attempt

behavior and suicidal thoughts. However, psychological pain was found to be higher in those thinking about suicide than those who had made a suicide attempt. Troister and colleagues (2013) conducted a longitudinal study of psychological pain and suicidal thoughts and planning among general and high-risk undergraduate students. Findings were supportive of the role of psychological pain in both current and future suicidal thoughts among both general undergraduates and those at high-risk for suicidal thoughts and behaviors. Psychological pain, as well as changes in psychological pain over time, were significantly associated with suicidal thoughts and planning. Additionally, Coohey and colleagues (2015) found that the number of sources of psychological pain (e.g., family, work) was predictive of suicidal thoughts alongside gender and past suicide attempts in a sample of homeless men and women.

Recently, Ducasse et al., (2018) performed a meta-analysis on the association between psychological pain and current or lifetime history of suicidal thoughts and behaviors. Findings indicated that the intensity of psychological pain was higher in those with a lifetime history of suicide attempts as well as with current suicide attempts and in those with lifetime history of suicidal thoughts and current suicidal thoughts than in those without suicidal thoughts or behaviors. These findings remained consistent even with depression statically controlled. As Ducasse et al. (2018) concluded, the utility of psychological pain in understanding suicidal thoughts and behaviors was both within the context of depression as well as independent. Verrocchio, Carrozzino, Marchetti, Andreasson, Fulcheri, and Bech (2016), in a systematic review focusing on the role of mental pain in suicide, concluded that there was clinical utility to a focus on mental pain as it was a core clinical factor in the understanding of suicidal thoughts and behaviors.

Perceptions of pain, as well as pain itself, may also be important to the understanding of the relation between pain and suicidal thoughts and behaviors. Work by Levi-Belz and colleagues (2018) examined what characteristics of pain were present in those who made a medically serious suicide attempt (those who resemble suicide decedents most closely). Those who made a medically serious suicide attempt often viewed their pain as irreversible. Meerwijk and Weiss (2018) found that those with high tolerance for psychological pain were more likely to report never engaging in an attempted suicide. Additionally, at high levels of psychological pain, those who perceived themselves as being able to cope were more likely to report no attempt than those with lower perceptions of coping. Perceptions that pain is irreversible is characteristic of hopelessness, which will be discussed in more detail and which is a vital component in the SPM.

II. Hopelessness & Suicidal Thoughts & Behaviors

The role of hopelessness in suicidal thoughts and behaviors has one of the longest histories in the literature of the factors under consideration in this review. Beck and colleagues (1974) proposed the Hopelessness Scale as a means of measuring experiences of hopelessness and compared results from this scale across hospitalized suicide attempt survivors, general medical outpatients, and depressed non-suicidal patients. Hopelessness was found to be related to both depression and suicide, with hopelessness having a stronger association with suicidal intent than depression did with suicidal intent. In a large prospective study (N = 1,958), Beck and colleagues (1990) found that hopelessness scores were successful at identifying 16 of the 17 participants in the study who went on to die by suicide. This high-risk group, determined by their hopelessness scores, were 11 times more likely to die by suicide than the remaining outpatients.

Work by Gooding and colleagues (2015) also provides support for the role of hopelessness in suicidal thoughts and behaviors. Examining the impact of hopelessness on the relationship between psychiatric symptoms (reflecting anxiety, depression, and psychosis), personality disorder symptoms, and suicide risk, Gooding and colleagues found that the presence of hopelessness strengthened the relationship between psychiatric and personality disorder symptoms and suicide risk. In addition to general hopelessness, research shows that it may be helpful to distinguish between positive and negative expectancy hopelessness in terms of their relations to suicidal thoughts and behaviors. Positive-expectancy hopelessness refers to hopelessness concerning future positive events/expectations (i.e., you do no perceive positive things happening in the future), while negative-expectancy hopelessness refers to increased beliefs about future negative events/expectations (i.e., you perceive that bad things will happen in the future). Horwitz and colleagues (2017), in a sample of 14-19-year-olds who screened at elevated suicide risk, found that positive-expectancy hopelessness was predictive of both depression and suicidal thoughts independent of baseline depression, suicidal thoughts, and negative-expectation hopelessness.

Despite the body of literature supporting hopelessness as a predictor of suicidal thoughts and behaviors, there is some evidence that call into question its strength as a predictor and its significance as a predictor of both suicidal thoughts and behaviors. For example, Ribeiro and colleagues (2018) conducted a meta-analysis of published longitudinal research on hopelessness from 1971 to 2014. Although they found that research generally supported the relationship between hopelessness and suicidal thoughts and behaviors, the overall predictions were weak and were further weakened when publication bias was considered. Burr and colleagues (2018) further explored the role of hopelessness in distinguishing between different forms of suicidal

thoughts and behaviors (e.g., suicidal thoughts, suicide attempts, suicidal planning). They found that trait hopelessness (i.e., an enduring hopeless characteristic) was predictive of suicidal thoughts and behaviors. However, state hopelessness (i.e., a temporary affective state) was unable to predict suicidal thoughts and behaviors. Steeg and colleagues (2016) explored the impact of hopelessness in a large cohort of those presenting to emergency departments for self-harm over the period of January 2000 to December 2010 (N = 19,479). They found that hopelessness exacerbated several risk factors for suicide which alone indicated heightened risk for suicide including: living alone, homelessness, unemployed status, problems with housing, past psychiatric treatment, and treatment for or use of alcohol during self-harming episode. Additionally, while not significant independent of hopelessness, forensic problems, physical health problems, and bereavement were associated with an increased risk of suicide when participants were also hopeless.

Qiu and colleagues (2017) conducted a 10-year prospective study to distinguish the impact of hopelessness on suicidal thoughts as well as attempt behavior. Hopelessness was higher among those experiencing suicidal thoughts and behaviors when compared to health controls. However, hopelessness was unable to distinguish those who attempted suicide from those who experienced suicidal thoughts, suggesting that hopelessness is meaningful in the development of suicidal thinking but not in the transition from thought to behavior. Findings such as this support the SPM postulation that hopelessness is important to understand the transition from experiencing pain to developing suicidal thoughts but is not hypothesized to predict suicide attempt behavior. Tucker and colleagues (2018) found that general hopelessness was not predictive of suicidal thoughts or behaviors but that the interaction of interpersonal hopelessness (i.e., hopelessness specifically about lack of belonging and perceptions of

burdensomeness), thwarted belongingness, and perceived burdensomeness was. Perceived burdensomeness and thwarted belonging, as previously discussed, are two important factors in understanding suicidal thoughts and behaviors and will be discussed in more detail below. Finally, a meta-analysis by McMillan, Gilbody, Beresford, and Neilly (2007) examined the predictive ability of the Beck Hopelessness Scale. Findings indicated that, although hopelessness was associated with those at risk for later self-harm and suicide, the specificity of hopelessness rendered it to be of unlikely use in the prediction of suicidal behavior. In other words, the measure was also characteristics of a large number of participants who do not go on to engage in suicidal behavior.

III. Perceived Burdensomeness & Suicidal Thoughts & Behaviors

As previously discussed, perceived burdensomeness is the perception that one is a burden at both a micro (to kin group) and macro (to society) level (Van Orden et al., 2010). Perceived burdensomeness can further be refined into two dimensions: a sense of liability ("my death is worth more than my life") and a sense of self-hate ("I hate myself"). A sense of liability is tied to a general sense of burdensomeness while self-hate is associated with lowered self-worth and self-esteem. Self-worth has an empirical history as a suicide risk factor predating the development of the IPTS model; this research will be discussed later in this document.

Self-Worth. Self-worth, operationalized as the regard one has for the self (Baumeister, Campbell, Krueger, & Vohs, 2003; Harter, 1993), and the similar construct of global self-esteem, have both been shown to predict negative mental health outcomes when low. For example, examining middle-school students, Renouf and Harter (1990) found that lower self-worth was related to higher levels of depressive mood. Garber, Robinson, and Valentiner (1997), examining relations between parenting and adolescent depression, found that an adolescent's

perceptions of self-worth partially mediated the effect of parenting strategies (such as maternal acceptance) on adolescent depressive symptoms, with the relationship between parenting strategies still significant, but the effect diminished by the presence of self-worth in the model. Recently, Orth and Robins (2013) reviewed the evidence for three theoretical explanations for the self-worth and depression link: (1) vulnerability model – low self-esteem contributes to depression, (2) scar model – depression erodes a person's self-esteem, and (3) diathesis-stress models – predispositions combined with life stress. Their review concluded that the strongest evidence supported vulnerability models, in which self-esteem contributes to the experience of depression. Their review also concluded that it was global, not domain-specific, self-esteem (which is akin to self-worth) which contributed most to depression (Orth & Robins, 2013).

Although it is important to examine relations between self-worth and mental health challenges, which are themselves associated with suicidal thoughts and behaviors, it is also critical to examine the specific associations between self-worth and suicidal thoughts and behaviors during adolescence and young adulthood. With this focus, Overholser, Adams, Lehnert, and Brinkman (1995) compared adolescent psychiatric inpatients and high school students. For both groups, lower self-worth predicted higher levels of depression, hopelessness, and suicidal tendencies (passive ideation, active ideation, and past suicide attempts). Similarly, decreases in self-worth over time have been shown to predict future suicide attempts in a robust sample of high school students in Norway (Wichstrom, 2000). In research examining various forms of self-esteem and self-worth and their relation to suicidal behavior, Wild, Flisher, and Lombard (2004) found that higher family specific self-esteem predicted lower incidence of suicidal behaviors (thoughts and attempts) and differentiated those who attempted suicide from those experiencing only suicidal thoughts for both girls and boys. Lower self-esteem linked to

body-image was marginally associated ($p < .06$) with increases in suicidal thoughts and behaviors among girls in the sample. Finally, girls in the sample with lower self-worth were more likely to report suicidal thoughts and behaviors than those with higher self-worth, but this finding did not reach statistical significance for boys.

Associations between self-worth and suicidal cognition and behavior are typically best understood when taken in context with other social and social-cognitive factors. For example, Brausch and Gutierrez (2010) compared three groups of adolescents, those engaging in no self-harm (group 1), those engaging in self-harm but not suicidal behavior (group 2), and those engaging in both self-harm and suicide attempt behavior (group 3), on measures of depression, self-worth, suicidal thoughts, social support, body satisfaction, and disordered eating behavior. They found significant differences across all groups with the non-NSSI/non-SA group (group 1) having the lowest scores on risk factors and the highest on protective factors and the NSSI/SA group (group 3) as having the highest scores on risk factors (such as depressive scores) and lowest on protective factors (such as self-worth). As another illustration of the value of considering self-worth in the context of other factors, Brausch and Decker (2014) examined self-worth and social support as moderators of the association between three risk factors (depression, disordered eating, and body satisfaction) and suicidal thoughts. Support moderated the effect of self-worth and parent support on the relation between depressive symptoms and suicidal thoughts. At high levels of self-worth and high levels of parental support, depression was not a significant predictor of suicidal thoughts, however, at lower levels of either self-worth or social support (parent or peer) depression was a significant predictor.

Other researchers have operationalized negative opinions of oneself as “worthlessness” and have found that this construal of self-worth may be especially important to consider in

research on suicidal cognition and behavior. Examining a large sample of participants suffering from a major depressive disorder, Jeon and colleagues (2014) found that feelings of worthlessness were the only statistically significant predictor of life-time suicide attempt of the depressive symptoms reported (e.g., loss of interest, insomnia, fatigue, depressed mood). Those reporting higher feelings of worthlessness were more likely to report life-time suicide attempt behavior than those at lower levels of worthlessness. Focusing on clinical factors associated with the death by suicide of psychiatric inpatients, Large and colleagues (2011) found that worthlessness was one of a number of factors moderately associated with inpatient deaths by suicide (the other factors identified were hopelessness, depressed mood, and feelings of inadequacy or guilt). Evidence from qualitative research also provides support for the role of worthlessness. Semi-structured interviews conducted with 80 street youth in Canada reviewed themes of worthlessness, loneliness, hopelessness, and a feeling of "being trapped" as most central to suicide among these youths (Kidd, 2004).

Perceived Burdensomeness. Burdensomeness on kin was first articulated as a potential causal mechanism in suicidal behavior by De Catanzaro (1980). Coming from sociobiological thinking, burdensomeness on kin refers to a burden on close kin that damages survival and reproduction likelihoods (such as by consuming resources). Later work by De Catanzaro attempted to formulate a mathematical model to explain suicide (1986). This mathematical model, which represents the cost versus benefit of continued existence, examined the likelihood of reproduction for the person, the cost to kin, and the relatedness to kin. According to De Catanzaro (1986) only in circumstances when cost of continued existence exceeds the likelihood of future reproduction, is suicide possible. Higher positive values derived from this formula would be associated with increased self-preservation while scores approaching zero would be

associated with diminished self-preservation. Only when scores calculated are negative is outright self-destruction possible (De Catanzaro, 1986). Some support was shown for the mathematical formula proposed, though little work has been done since (De Catanzaro, 1995).

However, with the development of the IPTS model, the role of burdensomeness in the development of suicidal thoughts and behaviors has become more established. Unlike the burdensomeness on kin proposed by De Catanzaro (1980), perceived burdensomeness, while potentially translating into actual burden on kin, is more likely to be a cognitive distortion. Perceived burdensomeness, comprised of the dimensions of liability and self-hate, has generally received support as a risk factor for suicidal thoughts and behaviors. Joiner and colleagues (2002) found support for the role of perceived burdensomeness in a sample of suicide notes by those who died by suicide and those who made non-lethal attempts. This sample consisted of 20 suicide notes from non-fatal and 20 suicide notes from fatal suicides. The presence of perceived burdensomeness was able to distinguish between fatal and non-fatal suicide notes when other established risk factors, such as emotional pain and hopelessness, were not. Perceived burdensomeness has also been supported as a predictor of suicidal thoughts and behaviors among an adult clinical sample even when controlling for hopelessness (Van Orden et al., 2006).

The role of perceived burdensomeness in suicidal thoughts and behaviors has also been supported across a number of developmental periods. Among adolescents, perceived burdensomeness has been supported as a mediator between interpersonal stress and suicidal thoughts (Buitron et al., 2016) and as predictive of suicidal thoughts in combination with lowered family connectedness (Opperman et al., 2015). Among young adults, perceived burdensomeness has partially accounted for the relationship between sexual orientation and suicidal thoughts (Hill & Pettit, 2012) as well as predicting suicidal thoughts and, when coupled

with lifetime number of suicide attempts, suicide attempt behavior (Joiner et al., 2009). Among older populations, perceived burdensomeness mediates the relationship between depressive symptoms and suicidal thoughts (Jahn et al., 2011). Also, among older adults, burdensomeness has been shown to predict suicidal thoughts independent of hopelessness, depressive symptoms, and functional impairment (Cukrowicz et al., 2011).

Although the role of perceived burdensomeness is generally supported by the literature in terms of its prediction of suicidal thoughts and behaviors, evidence does suggest some limitations of its predictive utility. Examining a large sample of suicide notes written by suicide decedents in Tasmania ($N = 261$), Gunn and colleagues (2012) found that the theme of perceived burdensomeness was only present in a little over 10% of the sample. Building on the study by Gunn and colleagues (2012), Lester & Gunn (2012) examined 664 suicide notes for the presence of perceived burdensomeness and thwarted belonging. Among this sample, perceived burdensomeness was only rated as present in 15.5% of the notes. Two recent systematic reviews into the IPTS draw different conclusions. Ma, Batterham, Calear, and Han (2016) reviewing 58 articles outlining 66 studies concluded that there was mixed evidence of the IPTS, though the strongest evidence centered on perceived burdensomeness. However, a recent review and meta-analysis by Chu and colleagues (2017) looking at 153 articles concluded that most findings support the IPTS. While support for perceived burdensomeness is the most robust of the IPTS constructs, these two reviews illustrate the importance of further research to investigate the role of perceived burdensomeness in the development of suicidal thoughts.

IV. Thwarted Belonging & Suicidal Thoughts & Behaviors

Thwarted belongingness refers to a lowered sense of connection to society and to others and is best conceptualized by the statement “I am alone” (Van Orden et al., 2010). This

construct can be further refined into two dimensions: (1) loneliness ("I feel disconnected from others") and (2) absence of reciprocal care ("I have no one to turn to"). The association between suicidal thoughts and behaviors and loneliness and social support has been examined independently of the concept of thwarted belongingness. Additionally, since the proposal of the IPTS, thwarted belongingness, comprised of both loneliness and absence of reciprocal care, has been examined. Further details are discussed below concerning the absence of reciprocal care (i.e., social support), the role of loneliness, and the construct of thwarted belongingness in the development of suicidal thoughts and behaviors.

Social Support. Social support was one of the first factors to be tethered to suicide in the scientific literature (e.g., Durkheim, 1897). Following Durkheim, much of the sociological work into suicide focused exclusively on his concept of social integration (Lester & Gunn, 2016). A 15-year review of the sociological literature on suicide found support for the role of social integration (Durkheim's term for broad social connectedness/support) in suicide (Stack, 2000). However, support varied in how social integration was operationalized at the sociological level, with the strongest support found for marital integration (social integration operationalized using marriage rates). Research in recent years has seen an increased focus on social connectedness and support due in large part to the development of novel theoretical models of suicidal thoughts and behaviors such as the IPTS (Joiner, 2005; Van Orden et al., 2010). Examining a sample of adolescents living in impoverished communities, Farrell, Bolland, and Cockerham (2015) found that increased perceptions of peer social support was associated with reduced risk of suicide attempt. However, other measures of social support such as perceptions of parental warmth and sense of community were not significantly related to suicidal behavior.

Hill, Rooney, Mooney, and Kaplow (2017) examined the link between perceived social support, thwarted belonging, and suicidal thoughts among lesbian, gay, and bisexual (LGB) college students. Findings supported the protective role of both family social support and LGB community support against suicidal thoughts. Miller, Esposito-Smythers, and Leichtweis (2015) found that, among adolescents admitted to a partial hospitalization program, perceptions of parent and school support were protective against suicidal behavior (ideation and attempt). Recently, Gunn, Goldstein, and Gager (2018) explored the role of social connectedness across several domains (social vs school vs parental connectedness) and found that changes in social and parental connectedness were associated with decreased likelihood of reporting suicidal thoughts at follow-up. Additionally, among those experiencing suicidal thoughts, increases in school connectedness lowered the likelihood of reporting a suicide attempt at follow-up. However, in contrast to some of the research discussed above, peer support did not emerge as a protective factor in this sample.

Viewing the associations between social support and suicide from an international and regional perspective, Sedivy, Podlogar, Kerr, and De Leo (2017) examined 75 regions in 23 European countries. They found that regions in which residents reported valuing the provision of social support more had lower rates of suicide than those who reported lower value for social support provision. However, whether valuing social support provision translated into greater social support in these communities could not be established. Bell and colleagues (2018) examined the role of perceived burdensomeness and social support in suicide and depression. They found that, although perceived burdensomeness was associated with both depression and suicide, social support was only related to depression (and not to suicide) when perceived

burdensomeness was also considered. When considered statistically together, only perceived burdensomeness (and not thwarted belonging) significantly predicted suicide attempt behavior.

Additionally, work by Hollingsworth and colleagues (2018) found that perceived burdensomeness mediated relations between perceptions of social support and suicidal thoughts as well as social connectedness and suicidal thoughts. Perceptions of social support were indirectly related to suicidal thoughts through the association of perceptions of social support to perceived burdensomeness and were not associated with suicidal thoughts independently of perceived burdensomeness. Thus, although there is empirical support for the importance of social support as a protective factor for suicidal thoughts and behavior, the evidence is somewhat mixed as to the impact of support from specific relational sources and how this support interacts with other social and cognitive factors.

Loneliness. Loneliness has an impact on both physical and psychological wellness, with increased morbidity and mortality as well as increased psychopathology and suicidal thoughts and behaviors (Hawkley & Cacioppo, 2010). Stravynski and Boyer (2001), examining 19,724 persons from a random sampling of the province of Quebec, found that there were strong associations between loneliness and suicidal thoughts, with loneliness examined both subjectively (i.e., affective state) and objectively (i.e., living alone or reporting not having friends). Page and colleagues (2006) explored relations among hopelessness, loneliness, and suicide attempt behavior in a sample of Southeastern Asian adolescents. In this sample, loneliness and hopelessness both predicted suicide attempt behavior. Additionally, when loneliness was statistically controlled, the association between hopelessness and suicide attempt behavior was significantly weakened. There is also evidence of an interactive effect between forms of social support and loneliness and their relationship to suicidal thoughts. Chang and

colleagues (2017) found that, among Hungarian college students, measures of family support were predictive of suicidal thoughts independent of loneliness. Additionally, these researchers found that there was an interaction between loneliness and family support, such that family support was a buffer against the impact of loneliness on suicidal thoughts.

Although loneliness has received support in the literature, there has also been some evidence indicating it is insufficient as a predictor of suicidal thoughts and behaviors. Lasgaard, Goossens, and Elkit (2011) examined adolescents' experiences of loneliness, depression, and suicidal thoughts both cross-sectionally and longitudinally. Findings indicated that although loneliness was associated with depression cross-sectionally, it was unrelated to depression over time. Neither in the cross-sectional nor longitudinal analyses were loneliness predictive of suicidal thoughts. Another longitudinal examination of the association between loneliness and suicidal thoughts and behaviors found similar results (Schinka et al., 2012). Schinka and colleagues (2012), examining the transition from middle childhood to adolescence, found that loneliness was related to current suicidal thoughts and behaviors, but was not predictive of future suicidal thoughts and behaviors.

Thwarted Belongingness. With the development of the IPTS, the construct of thwarted belongingness has been operationalized and tested. Gunn and colleagues (2012) found that thwarted belonging, more than perceived burdensomeness, was characteristic of some suicide notes in a sample of 261 suicide notes from Tasmania. Thwarted belongingness was found in 30.7% of the notes. In contrast, perceived burdensomeness was found in only 10.3% of the notes (with only 4.2% co-occurrence). Thwarted belongingness has also been supported as a mediator between variations in suicidal thoughts across academic semesters, with the highest rates of suicidal thoughts occurring in the summer months when away from classmates (Van Orden et al.,

2008). More recently, Chu and colleagues (2017) explored the association between insomnia and suicidal thoughts and behaviors, focusing on the potential influence of thwarted belongingness. Examining four separate populations (469 undergraduate students, 352 psychiatric outpatients, 858 firefighters, and 217 primary care patients), they found that more severe insomnia was indicative of more severe experiences of thwarted belongingness and suicidal thoughts and behaviors. Thwarted belongingness significantly accounted for the association that existed between experiencing insomnia and reporting increased suicidal thoughts and behaviors and did so both cross-sectionally as well as longitudinally.

Although the support for perceived burdensomeness is robust, the literature surrounding the role of thwarted belongingness is more mixed. Bryan and colleagues (2010) tested the three-way interaction between perceived burdensomeness, thwarted belongingness, and the acquired capability for suicide. Participants included a sample of active duty US Air Force personnel who were compared with an undergraduate and clinical sample for the frequencies of perceived burdensomeness, thwarted belongingness, and the acquired capability. They found that active duty military personnel, while lower in perceived burdensomeness than the undergraduate sample, scored significantly higher in the acquired capability for suicide. Additionally, hierarchical regressions with the active duty military sample found support for the role of perceived burdensomeness and the acquired capability as predictors of suicide attempt history. However, thwarted belongingness failed to reach statistical significance in the prediction of suicidal behavior. Testing the role of perceived burdensomeness and thwarted belongingness in the relationship between suicidal thoughts and sexual orientation, Hill and Pettit (2012) found support for the role of perceived burdensomeness but not thwarted belongingness. Additionally, Cero and colleagues (2015) found support for perceived burdensomeness, but not thwarted

belongingness in a large sample of undergraduates (N = 609) and psychiatric inpatients (N = 186). Nor did they find, as the IPTS postulates, an interaction effect between both constructs.

V. Racial Discrimination and Suicidal Thoughts and Behaviors

One factor that has unfortunately received little empirical attention in the research on suicide, and which is of importance to Study 1, has been racial discrimination. Because of the myriad negative physical and mental health sequela of racism and racial discrimination (Prelow et al., 2006; Hwang & Goto, 2008; Nadal et al., 2014), this is an unfortunate omission. Related research, however, has shown the deleterious impact of racial discrimination on psychosocial adjustment and mental health during adolescence. Using the MADICS, as Study 1 of the current dissertation does, Fuller and colleagues (2012) found that substance use was increased among African American students who perceived their teachers discriminating against them on the basis of race. However, believing that African Americans are viewed positively by others lessened the impact of these perceptions of racial discrimination on later substance use. Another study stemming from the MADICS explored the impact of perceived racial discrimination on health behaviors among males and females (Brodish et al., 2011). Findings supported gender as a moderator between perceived racial discrimination and substance use. Men who reported greater perceptions of racial discrimination reported more substance use, but this finding was non-significant for females (Brodish et al., 2011). Also using the MADICS, Wong, Eccles, and Sameroff (2003) explored the impact of perceptions of racial discrimination on African American adolescents' academic and psychological well-being. African American adolescents who experienced racial discrimination in school (by teachers and peers) experienced declines in grades, perceptions of academic ability, and the value placed on academic tasks between 7th and 8th grade. Additionally, they experienced increases in depression and anger and decreases in

self-esteem and psychological resilience as well as increases in the likelihood of having friends who are not interested in school and who engage in problem behavior (Wong et al., 2003). Although research into the impact of racial discrimination on suicidal thoughts and behaviors is scarce, there is some evidence that racial discrimination is linked to risk factors for suicide. Of importance to Study 1 is the association between racial discrimination, self-worth, and social support.

Self-worth. More research has been done examining the role of racial discrimination in perceptions of self-worth than has been done on the relation between racial discrimination and suicidal thoughts and behaviors. Verkuyten and Thijs (2006) explored the impact of ethnic discrimination on global self-worth among a large sample (N = 2682) of Turkish, Moroccan, Surinamese, and Dutch adolescents (10-13 years old). They found that adolescents reporting ethnic discrimination also reported lowered global self-worth. Additionally, they explored what impact ethnic self-esteem would have on this association, finding that ethnic self-esteem (self-esteem tied to the collective ethnic group) fully mediated the role between ethnic discrimination and global self-worth. Those adolescents who reported experiencing ethnic discrimination reported lower ethnic self-esteem. Additionally, low ethnic self-esteem was associated with lower evaluations of self-worth. Tynes and colleagues (2012) focused on racial discrimination experienced online and how it relates to experiences of anxiety among African American adolescents. Racial discrimination experienced was predictive of high anxiety scores, but this association was significantly reduced for those reporting high ethnic identity (such as feeling a sense of belonging to your ethnic group) and high self-worth.

Wei and colleagues (2013) investigated the impact of family support, self-worth, and perceived racial discrimination on the occurrence of psychological distress among Asian

American college students. They found that a three-way interaction between self-worth, perceived racial discrimination, and family support was a significant predictor of psychological distress among participants. Specifically, for Asian American males with low self-worth, the impact of perceived racial discrimination on psychological distress was apparent only in those who did not indicate greater family support. Those who had support from family did not experience psychological distress when perceiving themselves to have experience racial discrimination, despite their low perceptions of self-worth. Finally, Yip (2015) used growth curve models to explore the relationship between poor sleep quality and experiences of racial/ethnic discrimination on trajectories of depression and self-worth. Findings supported the role of racial discrimination in higher depression and lower self-worth, but only when it corresponded with poor sleep quality. Neither racial discrimination nor poor sleep quality were sufficient alone to predict depressive symptoms or lower self-worth.

African American youth who experience racial discrimination have also been shown to have lowered self-worth (Harris-Britt et al., 2007). However, when those youth experience positive race pride messaging, the impact of racial discrimination on self-worth is diminished. Mereish and colleagues (2016) compared African American males and Afro-Caribbean American males to explore the role of discrimination in the experience of depression and poor self-worth. They found that, among African American males, discrimination had an indirect effect on depressive symptoms through an impact on self-worth. This finding was not found for Afro-Caribbean American males. Seaton et al. (2010) explored the role of perceived discrimination on African American and Caribbean Black youths' reports of depressive symptoms, self-worth, and life satisfaction. These authors found a direct effect of perceived discrimination on increased depressive symptomatology, lowered self-worth, and lowered life-

satisfaction. Additionally, they found that these relations were influences by ethnicity, race, and gender such that older Caribbean Black females experience worse depressive symptomatology and greater decreases in self-worth and life satisfaction than did older African American males (Seaton et al., 2010).

Social Support. An increased sense of social support has been linked to increases in resilience and more positive health outcomes among racial/ethnic minority groups (Jasinskaja-Lahti et al., 2006; Brown, 2008) although perceptions of racial discrimination can have a negative impact on mental health (Pieterse et al., 2012). Prelow and colleagues (2006) compared three competing models of the impact of perceptions of racial discrimination on social support and psychological adjustment among African American college students: social support buffering (high social support would buffer against the negative effects of discrimination), social support mobilization (those exposed to discrimination would experience increases in social support as social networks mobilized to aid them), and social support deterioration (those experiencing discrimination would experience decreases in social support). Only the social support deterioration model received empirical support in this research, indicating that those who perceived greater racial discrimination also perceived lowered social support. Ajrouch and colleagues (2010), focusing on the perceptions of discrimination experienced by African-American women, found that experiencing moderate to high levels of discrimination were associated with increased reporting of psychological distress even when age, education, income, and self-reported health were considered. Participants who reported higher availability of emotional support reported less psychological distress experienced in the face of any racial discrimination. Additionally, among those reporting moderate levels of racial discrimination,

more instrumental support (e.g., having someone to watch children when needed) was associated with decreased psychological distress.

Some authors have argued that experiences of racial discrimination may have a sufficiently negative impact as to be considered a form of trauma (Carter, 2007). Wei and colleagues (2012) explored this in a sample of Chinese international students at predominantly white midwestern universities. Even when accounting for experiences of general stress, perceptions of racial discrimination were associated with posttraumatic stress symptoms. Additionally, they found that ethnic social connectedness (i.e., social connectedness felt within the individuals' ethnic community) moderated the results, such that increased ethnic social connectedness was associated with a decreased impact of perceived discrimination on posttraumatic stress symptoms. In contrast, general social connectedness (i.e., social connectedness felt to society in general) did not moderate this association. Cooper and colleagues (2013) examined the protective effect of family and community-specific forms of social support on the association between several negative outcomes and perceptions of racial discrimination. Using a large sample drawn from a school-based pregnancy prevention program, they examined these associations in a large sample of African American adolescents (N = 1,942). Overall, perceptions of racial discrimination were linked to greater negative outcomes. For both African American males and females, racial discrimination was associated with greater experiences of depressive symptoms as well as school suspensions. African American females also experienced greater adjustment (i.e., lower depressive symptoms and greater school engagement) when they had supportive mothers and fathers. However, only a supportive mother influenced African American males' adjustment. Additionally, religious connectedness and

having mentorship was protective for male adolescents in the sample but not for female adolescents.

These aforementioned studies clearly indicate that racial discrimination and racism is associated with psychosocial challenges; these studies also indicate that its impact can be moderated or mediated by other social or social-cognitive factors. As noted previously, the research specifically focusing on racial discrimination and suicidality is scant. That said, a few studies have examined these factors together and the results are generally consistent with the related research linking racial discrimination and mental health. For example, Diaz and colleagues (2001) collected data from a large sample of non-heterosexual Latino men in the United States ($N = 912$) to investigate the association between experiences of social discrimination (e.g., racism, homophobia) and symptoms of psychological distress such as depression, anxiety, and suicidal thoughts. They found that several experiences tied to homophobia and racism were predictive of suicidal thoughts within the population of this study. Specifically, homophobic bullying, racist bullying, homophobic violence as a child, racist violence as a child, homophobic job discrimination and racist job discrimination, homophobic police harassment, and racist police harassment all predicted suicidal behavior. Also interested in exploring the role of perceived discrimination, Gomez, Miranda, and Polanco (2011) examined an ethnically diverse sample of emerging adults for suicide attempt history in relation to acculturation stress and perceptions of discrimination. These authors found that perceptions of discrimination were associated with a greater likelihood of reporting past suicide attempts for Latino/a participants and European American participants but not for other racial groups.

Chou, Asnaani, and Hofmann (2012) examined the impact of racial discrimination on psychopathological symptoms experienced by Asian Americans (47% female, 39.4 average age

in years), Hispanic Americans (51.5% female, 37.8 average age in years), and African American. (59.9% female, 41.0 average age in years). Chou and colleagues found that experiences of racial discrimination were associated with the endorsement of major depressive disorder, panic disorder with agoraphobia, agoraphobia without history of a panic disorder, post-traumatic stress disorder, and substance use disorders across all three racial groups. These associations occurred independent of socioeconomic status, level of education, age, and gender. Wang, Wong, and Fu (2013) explored the role of perfectionism and perceived discrimination in the prediction of suicidal behavior and cognition among Asian international college students studying in the US. Perfectionism was conceptualized as maladaptive at high levels and when it consisted of both personal perfectionism (perceptions of failure to meet personal goals) and familial perfectionism (perceptions of failure to meet family standards). Both maladaptive perfectionism and perceptions of racial discrimination were associated with suicidal thoughts. Additionally, although perceived burdensomeness and thwarted belongingness were both independently associated with suicidal thoughts, the inclusion of maladaptive perfectionism and perceptions of racial discrimination strengthened this relationship. Finally, Walker and colleagues (2014) investigated the roles of depression and religiosity in the association between perceived racial discrimination and suicidal thoughts. Results indicated that perceived discrimination was associated with suicidal thoughts both directly and indirectly through depressive symptoms. However, when extrinsic religiosity (religiosity tied to a sense of community and personal benefit) was high, this relationship was nullified. The authors argue that African Americans, who typically have lower suicide rates despite greater societal stressors, may experience lower suicidal thoughts and behaviors due to the role of religion in African American communities (Walker et al., 2014).

VI. Relational & Physical Aggression & Suicidal Thoughts & Behaviors

The final factors of interest to the three studies outlined in this manuscript are relational and physical aggression. Relational and physical aggression have both been linked to suicidal thoughts and behaviors. Relational aggression pertains to aggression that targets social relationships, such as when rumors are spread, or peers are excluded (Crick, 1995; Crick & Grotpeter, 1995). Essentially, relational aggression involves harming others through the manipulation of social relationships. Physical aggression, in contrast, refers to behavior in which the act of harm is physical in nature, such as hitting, pushing, or weapon use. Various forms of peer aggression, relational and physical included, have been established as risk factors for experiencing negative mental health outcomes as well as suicidal thoughts and behaviors (Gunn & Goldstein, 2016). This section will review the evidence of the impact of these two forms of aggression on suicidal thoughts and behaviors. It is important to note as this body of literature is reviewed that those who engage in or are victimized by one form of aggression are often experiencing other forms as well, a finding that may be particularly relevant to relational forms of aggression (Dempsey, Sulkowski, Dempsey, & Storch, 2011; Waasdorp & Bradshaw, 2015).

There is a significant body of literature linking relational aggression and physical aggression with suicidal thoughts and behaviors (Gunn & Goldstein, 2016). Examining a large sample of students, van der Wal, de Wit, and Hirasing (2003) found that those experiencing peer aggression experienced greater depressive symptoms and suicidal thoughts regardless of gender. Additionally, these associations were strongest for those reporting relational aggression than those reporting physical aggression. Arango, Opperman, Gipson, and King (2016) collected a clinical sample of adolescents ($N = 321$) to explore the role of bullying and various bullying subtypes (verbal, relational, and physical) on suicidal thoughts and behaviors. Findings

supported an increased risk for suicidal thoughts as well as suicide attempts among those experiencing all bullying subtypes. Both engaging in bullying as a perpetrator as well as a victim were associated with increased suicide risk, with the only exception being those engaging in relational aggression perpetration who experienced no increased risk for suicidal thoughts or behaviors.

Focusing strictly on adolescent females, Massing-Schaffer and colleagues (2019) examined the associations between interpersonal and non-interpersonal stressors on suicidal thoughts and attempts over an 18-month study divided into two measurement periods. In preliminary analysis, they found that targeted rejection (the targeting of an individual for social exclusion and rejection) and non-specified interpersonal stress were positively associated with suicidal thoughts. Results also suggest that experiencing relational aggression and non-interpersonal stress were positively associated with suicide attempt behavior between Period 1 and 2. However, when depression and past suicidal thoughts and behaviors were controlled for in logistic regression analyses only relational aggression at Period 1 was predictive of suicide attempt at Period 2. Recently, Ford, King, Priest, and Kavanagh (2017) analyzed data from 3,537 adolescents aged 14-15 years collected from one wave of the Longitudinal Study of Australian Children. They found that involvement in bullying across all types (relational/verbal, physical, both) was associated with increased depression and anxiety. Those who experienced both relational/verbal and physical aggression were at the highest risk for reporting self-harm, suicidal thoughts and plans, and suicide attempt behavior.

However, not all evidence is a clear for relational aggression. Fite, Stoppelbein, Greening, and Preddy (2011) examined the association between relational aggression, depression, and suicidal thoughts among 276 children admitted at a children's psychiatric

inpatient facility. They found that relational aggression had an indirect influence on suicidal thoughts through the influence of relational aggression on depressive symptoms. Experiences of relational aggression increased depressive symptoms which in turn lead to increases in suicidal thoughts. Heilbron and Prinstein (2010) found, among 493 adolescents Grades 6-8, those experiencing physical aggression experienced increased suicidal thoughts over time. Those experiencing relational aggression had no elevated risk for suicidal thoughts, however those reporting low report of popularity did experience greater suicidal thoughts over time.

Summary

The SPM (shown in Figure 1) postulates that experiences such as relational aggression and physical aggression work as triggers for the experiencing of pain, which is the driving force behind suicidal thoughts and behaviors. Each of the risk factors that have been discussed fit into the SPM. Perceived burdensomeness (with self-worth as one measure of this), thwarted belongingness, and relational aggression would be classified as social triggers. They invoke the experiencing of social pain. Physical aggression is a form of physical trigger that invokes physical pain. However, as Figure 1 illustrates, social triggers and physical triggers do not exist in isolation. Experiencing something like physical aggression, while invoking physical pain, will also cause social pain, as it damages relationships. Psychological pain and the desire to escape from it results from experiencing these triggers. However, as the SPM stipulates, only when hopelessness is also present will those experiencing pain develop suicidal thoughts.

The three studies presented in this manuscript explore ways in which the above discussed constructs are associated with suicidal thoughts. Specifically, Study 1 explores the impact of self-worth, social support, and perceptions of racial discrimination in a longitudinal sample of African American and European American young adults making the transition out of high

school. Studies 2 and 3 examine the associations between perceived burdensomeness, thwarted belonging, relational and physical aggression, social support, psychological pain, and hopelessness and their impact on the suicidal thoughts. Study 2 does so using a novel dataset collected among undergraduates at a university in the Northeastern United States. Finally, Study 3 focuses on secondary data analysis using a pre-existing sample of participants from middle to late adulthood.

Study 1 is the first, to our knowledge, to examine associations of perceptions of racial discrimination, self-worth, and social support longitudinally. Further, although previous work has supported the role of high self-worth as a protective factor for suicidal thoughts, the significance of self-worth when examined with social support and perceptions of racial discrimination is less clear. Based on the research discussed above, an additional aim of Study 1 is to explore potential race and gender variation in the impact of perceived racial discrimination. An additional goal of Study 1 is to explore the interactive impact of social support with self-worth; as noted above the research on these factors when considered together is mixed (Bell et al., 2018; Hollingsworth et al., 2018). Some studies report protective effects for some forms of social support but not others (Farrell, Bolland, & Cockerham, 2015; Miller, Esposito-Smythers, & Leichtweis 2015; Gunn, Goldstein, & Gager, 2018) and other research has found self-worth, social support, and perceptions of racial discrimination to be related among some minority groups (Wei et al. 2013).

Studies 2 and 3 will be the first empirical tests of the Social Pain Model (SPM) which was proposed by Gunn (2017) as a means of understanding the development of suicidal thoughts and behaviors. The research reviewed thus far has supported the role of perceived burdensomeness, thwarted belongingness, psychological pain, and hopelessness in the

development of suicidal thoughts and behaviors. However, how these various risk factors work together to lead to the development of suicidal thoughts is less clear. The SPM provides a framework by which to make sense of these associations and focuses on psychological pain caused by the experience of social or physical triggers (e.g., the experiencing of relational or physical aggression, lowered social support).

The theoretical frameworks guiding each of the studies (the IPTS and SPM) allow for clear hypotheses to be evaluated in the current dissertation. Study 1, guided by the IPTS, focuses on the role of self-worth, social support, and perceptions of racial discrimination in the development of suicidal thoughts. As such, the study tests three hypotheses:

(H1) Low self-worth, low-social support, and high perceptions of racial discrimination will all be positively associated with suicidal thoughts.

(H2) Social support will not contribute to the prediction of suicidal thoughts independent of self-worth and perceptions of racial discrimination. When included in the regression analysis alongside self-worth and perceptions of racial discrimination, only self-worth and perceptions of racial discrimination will predict suicidal thoughts.

(H3) Race and gender differences on the impact of self-worth, social support, and perceptions of racial discrimination on suicidal thoughts will be observed. It is expected that the impact of self-worth and social support will vary by gender as evidenced in previous work (Donker, Batterham, Van Orden, & Christensen, 2014). Additionally, it is expected that perceptions of racial discrimination will predict suicidal thoughts among African American participants but not European American participants.

Study 2, which explores the SPM among college undergraduates, hypothesizes that:

(H1) Loneliness, perceived burdensomeness, relational aggression, and physical aggression will significantly contribute to the prediction of psychological pain in the model.

(H2) Psychological pain will not directly influence suicidal thoughts but will have an indirect positive effect on suicidal thought through the experience of hopelessness.

Study 3 will also explore the SPM with a sample of middle to late adults and, similar to Study 2, hypothesizes that:

(H1) Perceived burdensomeness, thwarted belonging, strains to friends, and strains to family will significantly contribute to the prediction of psychological distress.

(H2) Psychological pain will have a positive indirect effect on suicidal thoughts through its direct effect on hopelessness.

Chapter III: Study 1

I. Methods

Participants

Data for the present study is drawn from the Maryland Adolescent Development in Context Study (MADICS)[1], a community-based longitudinal study of adolescents and their families collected over multiple waves (PIs: Jacquelynne S. Eccles & Arnold J. Sameroff). The MADICS initially recruited participants from 23 middle schools located within a single county of Maryland. Participants' families were from a variety of socioeconomic backgrounds (averaging approximately $45,000-$49,000 at Wave 1); a unique feature of MADICS is that socioeconomic status is approximately evenly distributed across racial groups. Wave 1 was collected in the fall of 1991 when participants were in the 7th grade; the original sample consistent of 1,482 adolescents and their families. The sample had approximately the same

[1] For more information see: garp.education.uci.edu/madics.html

number of males and females (51% males, 49% females). These participants were followed over the course of an additional 5 waves, with the final wave (wave 6) occurring 3 years after the participants had graduated from high school. At each time point, efforts were made to recruit all prior participants into each wave of study.

The current study focuses on the final two waves of the MADICS, collected in 1998 and 2000, respectively. These two waves were collected after high school graduation (1 year and 3 years following high school, respectively). Table 1 depicts a breakdown of race, gender, and SES for the full MADICS sample during Waves 5 and 6. In order to facilitate hypothesis testing, the current analyses focuses specifically on European American and African American participants who responded to the question about suicidal thoughts at Wave 6. Thus, the final analysis for this paper focuses on 776 participants (515/66.1% African American) of whom 403 were males (51.9%) and 369 were females (47.6%).

Procedure

Wave 5 and 6 of data collection for MADICS was either self-administered and collected by mail or surveyed by telephone. Each self-administered questionnaire took approximately 45 minutes to complete. Any participants who failed to complete or return their self-assessments were followed-up via phone to gather information. Efforts to retain participants was exhaustive, using State Motor Vehicle Department records and forwarding address information to track participants.

Measures

The majority of the scales used in the MADICS are based on scales from previous large-scale projects. Details about this study's specific scales are reported below and more information about the items in general can be obtained from garp.education.uci.edu/madics.html.

Social Support. The social support scale was measured with 8 items and had acceptable reliability (α = .78). Sample questions include: "When you have a social or personal problem, how often can you depend on: your romantic partner to help you out?" or "When you have a social or personal problem, how often can you depend on: your friends to help you out?" Scores on these items ranged from 1 (almost never) to 5 (almost always), with greater scores on the scale indicating greater perceptions of available social support and were averaged to compute a social support score.

Self-Worth. Self-worth was measured by two items measured on a 1 through 3 scale at Wave 5. The first item was "I feel like (1) I hate myself – (3) I like myself" and the second item was "I am worthless (1) All the time – (3) Once in a while." These items were selected for inclusion in the current analyses as they reflected the self-loathing aspect of self-worth that most closely is characterized by the construct used in suicide research called perceived burdensomeness (Van Orden et al., 2010) and were most reflective of feelings of worthlessness, and thus would be most consistent with the previously discussed research on suicidal thoughts and behaviors. Scores from both questions were averaged to compute the scale; high scores indicating higher self-worth. This measure had adequate reliability (α = .63).

Perceptions of Racial Discrimination. This scale was measured using two items with response options ranging from 1 (strongly disagree) to 4 (strongly agree). The two items were: "Because of your race, no matter how hard you work, you will always have to work harder than others to prove yourself" and "Because of your race, it is important that you do better than other people at work or school to get ahead." These items were averaged to create a perceptions of racial discrimination score (α = .92); higher scores indicate increased experiences of racial

discrimination. These items were selected for analyses in the current study because they were particularly relevant for young adults during the transition to work/ out of high school.

Suicidal Thoughts. For both waves, suicidal thoughts were measured with the question "During the last month (including today), how often have you had thoughts of ending your life?" This variable is measured on a 1 (almost never) to 5 (almost always) scale, with higher scores indicating greater frequency of suicidal thoughts.

Depression. Depression was measured with 4 items at Wave 5 ($\alpha = .76$). Sample questions include: "I feel like crying (1) every day, (2) many days, (3) almost never," "I am sad (1) once in a while, (2) many times, (3) all the time," and "I feel like (1) nothing will ever work out for me, (2) I am not sure if things will work out for me, (3) things will work out for me O.K." All items were measured on a 1 through 3 Likert Scale and when necessary, measures were reverse coded prior to scale construction. Scores were computed by averaging items; higher scores indicate increased depressive symptoms.

Data Analysis Plan

Given our interest in exploring the impact of self-worth, social support, and racial discrimination and their interactions at wave 5 on suicidal thoughts at wave 6 we utilized hierarchical multiple regression. A series of four hierarchical multiple regressions (one each for each racial/gender group) were conducted to examine the impact of our predictors among African American males, African American females, European American males, and European American females. As indicated in our review of the literature, the research examining the associations between self-worth, social support, and suicidal thoughts is mostly comprised of samples of European American participants. Additionally, although experiencing racial discrimination has been linked to suicidal thoughts and behaviors among African American

participants, it has not been examined simultaneously with perceptions of self-worth and social support.

II. Results

Descriptive Statistics

A series of 2 (gender: male, female) x 2 (race: African American, European American) ANOVAs were conducted to test for gender and race differences on all study variables. Descriptive statistics and *F*-test results are reported in Table 2. There were several differences that were statistically significant. For example, mean scores on social support were significantly different for gender, race, and their interaction. African American males reported greater social support than European American males and European American females reporting greater social support than African American females. Another significant result pertained to racial discrimination. African American males and females reported greater perceptions of racial discrimination, as compared to their European American peers. Regarding suicidal thoughts, African American participants reported greater suicidal thoughts at Wave 5 but there were no significant differences in suicidal thoughts at Wave 6. Finally, for both African American and European American participants, males' participants reported greater depressive symptoms than did female participants.

Correlations Among Study Variables

Tables 3 and 4 present bivariate correlations among study variables for African American and European American participants, respectively. Both tables are organized by gender. Several significant associations emerged and were generally consistent across both race and gender. Overall, suicidal thoughts at wave 6 were associated with past suicidal thoughts, depression, and

self-worth. The only exception to this general trend was for European American females; wave 5 and wave 6 suicidal thoughts were not significantly correlated.

Model Testing

The goal of the final series of analyses are to test the longitudinal impact of self-worth, social support, and perceptions of racial discrimination on suicidal thoughts. As noted previously, the interest is in assessing how those predictor variables measured one year after high school are associated with suicidal thoughts 2 years later (controlling for previous levels of suicidal thought). These analyses were conducted separately by racial and gender group (resulting in a total of 4 regression analyses). As noted previously, this approach was warranted based on the lack of research exploring the impact of self-worth, social support, and racial discrimination on suicidal thoughts among African American youth. Results of the 2X2 ANOVA also support our exploration of gender and race differences. At Step 1, suicidal thoughts at wave 5, depression at wave 5, self-worth at wave 5, social support at wave 5, and perceptions of racial discrimination at wave 5 were entered. At Step 2 the interaction scores of self-worth and social support, self-worth and perceptions of racial discrimination, and social support and perceptions of racial discrimination were entered to further explore the relationships between our predictors. Results of these analyses can be seen in Table 5.

African American Females. Suicidal thoughts, depression, self-worth, social support, and perceptions of racial discrimination experienced one-year out of high school were entered at Step 1 and did not significantly predict suicidal thoughts three-years out of high school. After entry of interactions at Step 2 the total variance explained by the model was 20.9%. The addition of the interactions explained an additional 11% of the variance in suicidal thoughts three-years out of high school, $\Delta R2 = .11$. In the final model, only the interaction of self-worth

and social support significantly predicted suicidal thoughts three-years out of high school. Further exploration of this interaction can be seen in Figure 2. Those experiencing low social support and low self-worth reported the highest suicidal thoughts three-years out of high school.

African American Males. Suicidal thoughts, depression, self-worth, social support, and perceptions of racial discrimination experienced one-year out of high school were entered at Step 1 and did not significantly predict suicidal thoughts three-years out of high school. After the entry of interactions at Step 2 the total variance explained by the model was 38.7%. The addition of the interactions explained an additional 22% of the variance in suicidal thoughts three-years after high school, $\Delta R2 = .22$. In the final model, only the interaction of self-worth and perceptions of racial discrimination significantly predicted suicidal thoughts three-years out of high school. Figure 3 further illustrates this interaction effect. When perceptions of racial discrimination were low, lower self-worth was associated with greater reporting of suicidal thoughts three years out of high school. When perceptions of racial discrimination were high, higher self-worth was associated with greater reporting of suicidal thoughts three years out of high school.

European American Females. Suicidal thoughts, depression, self-worth, social support, and perceptions of racial discrimination experienced one-year out of high school were entered at Step 1 and significantly explained 20.6% of the variance. Only self-worth was a significant predictor at Step 1, with greater self-worth associated with lowered reporting of suicidal thoughts three-years out of high school. After entry of the interactions at Step 2 the total variance explained by the model was 41.3%. The addition of the interactions explained an additional 21% of the variance in suicidal thoughts three years after high school. Both the interactions of self-worth and social support and self-worth and perceptions of racial discrimination were

statistically significant predictors. Figures 4 and 5 help to illustrate the nature of these interactions. European American females who reported lower social support and lower self-worth reported the greatest suicidal thoughts three-years after high school (Figure 4). European American females who reported higher perceptions of racial discrimination and lower self-worth reported the highest suicidal ideation three-years out of high school (Figure 5).

European American Males. Suicidal thoughts, depression, self-worth, social support, and perceptions of racial discrimination experienced one-year out of high school were entered at Step 1 and significantly explained 25.3% of the variance. Only self-worth was a significant predictor at Step 1, with greater self-worth predictive of lower reports of suicidal thoughts three-years out of high school. After the entry of the interactions at Step 2 the total variance explained by the model was 56.5%. The addition of the interactions explained an additional 31% of the variance in suicidal thoughts three-years after high school, $\Delta R2 = .31$. The interaction of self-worth and social support was a significant predictor at Step 2. Additionally, the interaction of self-worth and perceptions of racial discrimination was also a significant predictor at Step 2. Figures 6 and 7 help to illustrate the nature of these interactions. European American males' self-reports of lowered self-worth and lowered social support were associated with the highest reports of suicidal thought three-years out of high school (Figure 6). European American males reporting high perceptions of racial discrimination and lower self-worth had the highest ratings on suicidal thoughts three-years out of high school (Figure 7).

III. Discussion

The present study examined the role of self-worth, social support, and perceptions of racial discrimination in the onset of suicidal thoughts in a large, longitudinal sample of African American and European American youth transitioning out of high school. We hypothesized that

self-worth, social support, and perceptions of racial discrimination would all be significantly associated with suicidal thoughts (H1), that social support would not contribute to the prediction of suicidal thoughts independent of self-worth and perceptions of racial discrimination (H2), and that the impact of racial discrimination on suicidal thoughts would be greatest for African American participants (H3).

Interesting findings regarding our predictors (i.e., self-worth, social support, and perceptions of racial discrimination) emerge when interactions are considered. For European American males and African American females, the associations between self-worth and social support was as expected based on previous research. Lower self-worth and lower social support were associated with the highest risk of reporting suicidal thoughts. This is consistent with current theoretical frameworks for suicidal behavior. Specifically, this finding provides support for the Interpersonal-Psychological Theory of Suicide (IPTS) proposition that suicidal motivation stems from the occurrence of both a lowered sense of belonging as well as a lowered opinion of one's value, or self-worth (Joiner, 2005; Van Orden et al., 2010). However, our findings regarding European American females are less clear. For European American females, high social support and low self-worth interacted to confer the greatest risk of reporting suicidal thoughts. It is possible that this finding is reflective of the increased help-seeking behavior exhibited by European Americans and females as compared to minority groups and males (Masuda et al., 2009; Nam, et al, 2010).

However, our findings regarding African American males are less clear. Among African American males, elevated suicidal thoughts occurred in two patterns. First, youth who reported low perceptions of racial discrimination and low self-worth reported greater suicidal thoughts. Second, youth who reported high perceptions of racial discrimination and high self-worth also

reported greater suicidal thoughts. These findings are interesting given their implications. When there are low perceptions of racial discrimination, findings for African American males are consistent with theoretical explanations for suicide (such as the IPTS) in that low self-worth was associated with greater suicidal thought. However, those reporting higher perceptions of racial discrimination experienced more suicidal thoughts when they reported higher self-worth. This finding could indicate that for African American males who perceive themselves as having value, the experiencing of racial discrimination is especially destructive.

Our findings regarding social support is not entirely surprising given some work that points to less of an impact of social support on African American males. Paxton, Robinson, Shah, and Schoeny (2004) found that among African-American male adolescents from an inner-city, Midwestern high school, social support did not moderate the association between exposure to community violence and psychological distress. However, more recent evidence suggests that the impact of different forms of support (such as maternal vs paternal vs community) vary by gender, with African American males and females differing in whether a protective effect is seen (Cooper, Brown, Metzger, Clinton, & Guthrie, 2013). The present study's social support measure focused on interpersonal support (such as support given by romantic partners, friends, and family), whereas some evidence has shown that African American adolescents experienced community support (such as religious connection and mentorship) as protective. It is possible that future research focused on community support may find stronger evidence of a protective effect of social support on suicidal thoughts exhibited by African American participants. Future research should therefore attempt to replicate these findings with a community support sample.

There are several limitations that must be considered when evaluating the findings from this study. First, the current study only focused on African American and European American

youth during the first three years after high school graduation. Therefore, it is not clear whether these findings would generalize to youth in other age groups or from other backgrounds. Second, the aspect of self-worth that we focused on in the present study was self-hate and loathing, which is conceptually similar to perceived burdensomeness and worthlessness. Although this makes the findings comparable to other studies focusing on suicidal thoughts and behaviors, it is possible that other aspects of self-worth will yield different results. Future research should explore this issue. Third, the present study focused on suicidal cognition only, not behavior, and thus it is not clear the extent to which the current variables interact to predict suicidal behavior. It will be important for future work to examine this issue. Finally, because there was a two-year time span between the two points of measurement included in the present study, there may be fluctuations in study variables that occurred during the interim that are not captured in the current analyses.

Despite the limitations to the present study, there are also several strengths that must be considered in examining the results thus far discussed. The MADICS data, representing a large and diverse sample of adolescents followed through their transition to adulthood, provides a unique sample to study the transition to young adulthood, which is a time of heightened risk for death by suicide. This, considered with the low rates of attrition and the empirically supported risk factors for suicide within the data, lends the MADICS as an excellent source of inquiring into non-fatal suicidal behavior among adolescents and young adults.

In summary, Study 1 of the current dissertation shows that significant variation exists in associations among social support, self-worth, and perceptions of racial discrimination across race and gender. These predictors also vary by race and gender in terms of their impact on suicidal thoughts. Self-worth, independent of other factors, was only a significant predictor of

suicidal thoughts for European American participants. However, when interactions between social support, self-worth, and perceptions of racial discrimination were examined, patterns across all groups emerged. Given that adolescence through young adulthood is a period of heightened risk for suicide, future research must continue to explore the relationships of key risk factors, such as self-worth, to better understand the development of suicidal thoughts among emerging adults.

Chapter IV: Study 2

I. Methods

Participants

Participants (N = 252) were recruited from a large doctoral level research university in the Northeastern United States, as part of a larger project on social developmental transitions during the emerging adult years. All participants were students who attended the university; participants were invited to participate by in-person recruitment from classes in various departments across the academic curriculum (e.g., psychology, family science and human development, business, physical sciences, public health). Participants ranged in age from 18 to 38 with an average age of 21.22 (*SD* = 2.79). The sample was comprised of 188 females (74.6%), 60 males (23.8%), 1 (0.4%) participant who preferred not to categorize themselves in terms of gender identity, and 3 (1.2%) who reported no response. In terms of sexual orientation, most participants identified as heterosexual/straight (89.7%). Regarding racial identity, the participants primarily identified themselves as White/ European American (52.8%), Hispanic (21.0%), and Black/African American (10.3%).

Procedures

Recruitment emails were sent out to faculty members in various departments across a large doctoral level university in the Northeastern United States. If the professor agreed for recruitment to take place in their class, a trained researcher read a prepared statement outlining the pertinent details of the study; informed consent was then collected. The trained researcher was either the author of the current dissertation, his dissertation advisor, or a doctoral student in Family Science and Human Development who had been specifically trained on survey administration techniques. Professors typically ended class about 45 minutes early so that survey completion could take place during regular class time. Surveys took approximately 35-40 minutes to complete. Participants were rewarded for their participation with candy and small trinkets (such as erasers and pencils). Data collection took place in the students' regular university classrooms or after class in a nearby lab setting under researcher supervision. All study procedures were approved by the university's IRB.

Measures

Although the larger project from where these data were drawn includes additional items, the present study focuses on those pertinent to an evaluation of the SPM model of suicidal behavior (Gunn, 2017). These include measures of relational and physical victimization, perceived burdensomeness, thwarted belonging, psychological pain, suicidal thoughts, and hopelessness. These measures will be discussed in greater detail below.

Relational and Physical Victimization. Measures of relational victimization and physical victimization were included as social pain and physical pain triggers, respectively. These measures were used previously by Goldstein (2011) and combined items from the Self-Report of Aggression and Social Behavior (Morales, 1999; Morales & Cullerton-Sen, 2000) with

additional items created by Goldstein (2011). In previous research, the Self-Report of Aggression and Social Behavior has shown adequate internal consistency as well as construct validity (Linder et al., 2002; Lento-Zwolinski, 2007; Bailey & Ostrov, 2008; Ostrov & Houston, 2008; Murray-Close et al., 2010; Czar et al., 2011). The scale used in the current study is comprised of 13 items measuring relational aggression and 6 items measuring physical aggression on a 1-7-point Likert scale and measures relational and physical aggression experienced in both romantic and friend relationships. These instruments had good internal consistency in the current study for both relational (Cronbach's $\alpha = 0.87$) and physical (Cronbach's $\alpha = 0.82$) aggression. Scores were computed by averaging items; higher scores reflect greater experiencing of relational or physical aggression. Sample items include: "My friend ignores me when he/she is angry with me," "a friend of mine has gone behind my back and shared private information about me with other people," "my romantic partner has threatened to break up with me in order to get me to do what she/he wants," and " my romantic partner has tried to get his/her own way through physical intimidation."

Loneliness. Loneliness was measured using the UCLA-Loneliness Scale (Russell, Peplau, & Ferguson, 1978). The UCLA-Loneliness Scale is a 20-item measure which each measure rated on a 1 (Never) to 4 (Often) scale. The measure has been shown to be both valid and reliable as a measure (Russell, Peplau, & Cutrano, 1980; Hartshorne, 1993; Russell, 1996). The UCLA-Loneliness exhibited very good internal consistency (Cronbach's $\alpha = .93$). Scores were computed by averaging with higher values being indicative of greater loneliness. Sample items include: "How often do you feel that you are 'in tune' with the people around you," "How often do you feel left out," and "How often do you feel that you are no longer close to anyone?"

Perceived Burdensomeness. Perceived burdensomeness was measured using the perceived burdensomeness subscale of the Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2008). The INQ is comprised of 15 items, and 6 of them measure perceived burdensomeness. The scale ranges from 1 (not at all true for me) to 7 (very true for me). In previous research, the INQ has been evaluated psychometrically and found to be both valid and reliable (Marty et al., 2012; Van Orden et al., 2012; Freedenthal et al., 2011). The perceived burdensomeness subscale had very good internal consistency (Cronbach's $\alpha = .94$) in the current sample. Scores were computed by averaging; higher scores indicating greater experiences of perceived burdensomeness. Sample items for perceived burdensomeness include: (1) these days, the people in my life would be better off if I were gone, (2) I think I am a burden on society, (3) I think my death would be a relief to the people in my life.

Suicidal Thoughts. Suicidal thoughts were assessed using the Depression System Index – Suicidality Subscale (DSI-SS; Joiner, Pfaff, & Acres, 2002). The DSI-SS has been examined and found to be a reliable and valid measurement of suicidal behavior (Batterham et al., 2015; Joiner et al., 2002). This scale is comprised of 4 items ranging from 0 to 3. This scale had very good internal consistency in the current sample (Cronbach's $\alpha = 0.88$). Scores were computed by averaging with higher values indicative of greater suicidal thoughts. The four items assess: suicidal thoughts ranging between 0 (I do not have thoughts of killing myself) and 3 (I always have thoughts of killing myself), suicidal planning ranging between 0 (I am not having thoughts about suicide) and 3 (I am having thoughts about suicide and have formulated a definite plan), lack of control ranging between 0 (I am not having thoughts about suicide) and 3 (I am having thoughts about suicide but have little or no control over these thoughts), and suicidal impulses

ranging between 0 (I am not having impulses to kill myself) and 3 (in all situations I have impulses to kill myself).

Depression and Anxiety. Depression was assessed using the short-form of the Depression Anxiety Stress Scales (DASS-21; Henry & Crawford, 2005). The DASS-21 is a 21-item-scale with scores ranging between 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). The scale has been assessed psychometrically and found to be both valid and reliable (Ng et al., 2007; Henry & Crawford, 2005; Antony et al., 1998). This scale also showed very good internal consistency in the current sample (Cronbach's $\alpha = .92$). Scores were computed by averaging; higher values are representative of greater depressive symptoms. Sample items include: "I couldn't seem to experience any positive feeling at all," "I found it difficult to work up the initiative to do things," and "I felt that life was meaningless."

Hopelessness. Hopelessness was measured using the Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974). The BHS consists of 20 true/false statements and has been psychometrically supported in previous research (Bouvard et al., 1992; Beck et al., 1974). This scale had very good internal consistency (Cronbach's $\alpha = 0.87$) in the present sample. Scores were computed by summing all items. Higher scores indicate greater hopelessness. Sample items include: "I look forward to the future with hope and enthusiasm," "my future seems dark to me," and "the future seems vague and uncertain to me."

Psychological Pain. Inspired by questions on the Psychological Pain Assessment Scale (PPAS; Shneidman, 1999), participants were asked to indicate their level of psychological pain at the present moment based on a request to, "rate your psychological pain at present" using a scale ranging from (1) least possible) to 9 (most possible). Thus, higher scores on this item indicated greater psychological pain.

Social Support. Social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). This scale has been shown to have good psychometric properties in previous work (Edwards, 2004; Canty-Mitchell & Zimet, 2000; Zimet et al., 1988). The MSPSS is comprised of 12 items measured on a 1-7-point Likert scale and had very good internal consistency (Cronbach's $\alpha = .91$). Scores were computed by averaging with greater values indicating more social support. Sample items include: "There is a special person who is around when I am in need," "I can count on my friends when things go wrong," and "I get the emotional help and support I need from my family."

Data Analysis Strategy

Given the objective of exploring the SPM framework of suicide (Gunn, 2017), path analysis with AMOS was used. Path analysis allows for exploring hypothesized causal pathways as well as direct and indirect effects making it an ideal candidate for the present study (Byrne, 2001). Figure 8 provides the hypothesized model. Under this model, as described in the introduction, high experiences of social pain triggers (e.g., perceived burdensomeness, thwarted belonging, relational aggression) as well as physical pain triggers (e.g., physical victimization) will predict high psychological pain and all will be indirectly related to suicidal thoughts through their relationship to psychological pain. Additionally, there will be an indirect effect of psychological pain on suicidal thoughts through the experience of hopelessness.

II. Results

Sample Characteristics and Bivariate Results

The first analytic step was to explore descriptive data on the constructs measured in the current study, and to test for gender differences. Testing for gender differences was critical as many of the variables measured have been shown to be experienced differently for males versus

females (Czyz, Berona, & King, 2015; Goldstein; & Tisak, 2004; Goldstein, 2011; Rich, Kirkpatrick-Smith, Bonner, & Jans, 1992). These results can be seen in Table 6. Across all variables in the model there were no significant gender differences. In addition, bivariate relationships were also examined by gender. Table 7 depicts these findings. All relations were in the expected direction and provide preliminary support for the hypothesized relations between model constructs for female participants. For example, psychological pain was positively and moderately associated with suicidal thoughts. However, for male participants a number of study constructs did not have significant associations with suicidal thoughts. Most notably, among male participants, relational victimization did not have a statistically significant relationship with any other study variables with the exception of psychological pain. This finding contrasts with that of female participants, for whom relational victimization was significantly associated with all study variables.

Model Testing

To test the hypothesized model (Figure 8), a path analysis was performed. The overall fit of the model can be assessed using the chi-square statistic; however due to limitations to this fit index (such as susceptibility to sample size), other indices are needed (Byrne, 2001). There are a number of fit indices computed by AMOS, but prior work has supported the reporting of chi-square, comparative fit indices (CFI), and root-mean-square error of approximation (RMSEA) as sufficient for evaluating model fit (McDonald & Ho, 2002). Figure 9 shows the results of the path analysis testing the hypothesized model. Although not shown in the figures, all exogenous variables were permitted to correlate with one another and gender was included as a control variable as the number of males was not large enough to allow for gender moderation testing. Figure 9 illustrates the results of the path analysis. Overall, the model fit the data adequately.

Chi-square goodness-of-fit (X^2 = 7.64, df = 3, p = .054) and the comparative fit index (CFI = .995) indicated good fit while the root mean square error of approximation (RMSEA = .078) indicated good to adequate fit (MacCallum, Browne, & Sugawara, 1996). The model explained 39.7% of the variance in psychological pain, 23.7% of the variance in hopelessness, and 46.6% of the variance in suicidal thoughts.

Direct Effects. As can be seen in Figure 9, consistent with the hypothesized model, perceived burdensomeness, loneliness, and depression had direct effects on psychological pain. Also, in line with the hypothesized model, psychological pain had a direct effect on hopelessness. Hopelessness, in turn, had a direct effect on suicidal thoughts. Not in line with our hypothesized model was the direct effect of perceived burdensomeness on suicidal thoughts nor the direct effect of perceived burdensomeness (β = .26) on hopelessness. Additionally, we observed no direct effects of relational victimization, physical victimization, or social support on psychological pain.

Indirect Effects. In addition to direct effects, indirect effects of the variables on the model were also assessed. Given that indirect effects are the product of two effects, it has been recommended to view effects of .01 as small, .09 as moderate, and .25 as large (Preacher & Kelley, 2011). Table 8 shows the direct, indirect, and total effects of the model constructs. Consistent with the SPM, although psychological pain did not have a *direct* effect on suicidal thoughts, it did have a moderately strong *indirect* effect on suicidal thoughts. Specifically, it influenced suicidal thoughts through hopelessness, as predicted by the SPM. Not consistent with the SPM but in line with the predictions of the IPTS, perceived burdensomeness also had a moderately strong indirect effect on suicidal thoughts through hopelessness.

III. Discussion

The present study was the first test of the Social Pain Model (SPM) proposed by Gunn (2017). Figure 8 illustrates the hypothesized model that was evaluated by the present study. Building off the theoretical framework put forward by Gunn (2017), several risk factors for suicide (e.g., loneliness, perceived burdensomeness, relational & physical victimization) were anticipated to lead to increased reporting of psychological pain. Further, it was expected that psychological pain would not be directly associated with suicidal thoughts; rather, this association would be fully mediated by hopelessness. In other words, that psychological pain would have an indirect effect on suicidal thoughts through hopelessness. The strongest support for the SPM would be shown if both postulates were found to be accurate as well as if these risk factors exhibited no direct effects on suicidal thoughts.

Partial support for the hypothesized model (Figure 8) was found. As can be seen in Figure 9, a few our hypothesized paths were statistically significant. Perceived burdensomeness, loneliness, and depression were all associated with increased reporting of psychological pain. Additionally, psychological pain was indirectly associated with suicidal thoughts through the construct of hopelessness and this indirect effect was fairly robust. However, not in line with the hypothesized model, we found a direct effect of perceived burdensomeness on both hopelessness and suicidal thoughts. This finding is more consistent with the proposed paths of the Interpersonal-Psychological Theory of Suicide (IPTS). The IPTS proposes that perceived burdensomeness and thwarted belongingness lead to suicidal thoughts mediated by hopelessness (Van Orden et al., 2010). Experiences of perceived burdensomeness and thwarted belongingness lead to increased hopelessness and indirectly to suicidal thoughts through hopelessness. However, only perceived burdensomeness and not loneliness had a direct effect on hopelessness.

Additionally, a number of risk factors, such as relational and physical aggression, did not have significant paths to psychological pain.

There are a number of limitations that need to be considered when examining the present study. One limitation is the cross-sectional nature of the data. This sample was collected at a single time-point. Although the hypothesized model gives the illusion of a progression from our risk factors to our outcome, the current data does not represent changes over time. Future work will need to examine the hypothesized model across several time-points to establish this hypothesized progression over time. Additionally, the current data is from a convenience sample of young adults enrolled in undergraduate classes at a large research university in the northeastern United States. Therefore, results found with this sample may not be generalizable to other samples (e.g., clinical populations). Another limitation pertains to the gender breakdown of the sample. Our sample consisted of 60 males (23.8%) and because of this small sample size, we were not able to explore gender differences in our model. Gender was instead included as a control variable. Future work exploring the proposed model with a focus on gender differences would be vital to establishing applicability of the SPM across male and female participants. For example, future work that explores gender differences in the model may find that, for female participants, relational victimization does contribute to the development of psychological pain and subsequent suicidal thoughts. Relational victimization, while occurring in both males and females, may be particularly relevant to understanding female adolescent suicide (Gunn & Goldstein, 2016). The same could also be said of racial differences in the model. Insufficient numbers of non-white participants meant that direct racial comparisons were not possible apart from comparisons between non-white and white participants. However, given variation in characteristics of suicide across different racial or ethnic groups, a comparison of

this sort was not thought justified (Gunn & Gunn, 2014). However, even though comparisons were not possible, the sample diversity was roughly equivalent to the US population. Future research with large and diverse samples would be very beneficial. Finally, the SPM as a theoretical framework is meant to explain suicidal behavior, not simply suicidal thoughts. The present study examined the impact of several risk factors on the experiencing of psychological pain and how this relates to suicidal thoughts but did not explore suicidal behavior. Future work will need to examine the transition from experiencing suicidal thoughts to engaging in suicidal behavior.

Despite these limitations, the present study represents the first exploration of the SPM and provides some support for this theoretical framework. As proposed by the SPM, several social pain triggers (i.e., perceived burdensomeness and loneliness) were associated with the experiencing of psychological pain. Additionally, psychological pain had a robust indirect influence on suicidal thoughts through hopelessness. Although several social pain triggers did not emerge as significant predictors of psychological pain in the current data (i.e., relational and physical victimization), perceived burdensomeness and thwarted belongingness, two well established risk factors for suicide, were. As a first step in exploring the theoretical framework outlined by Gunn (2017), the present study has established that further examination of the SPM is warranted. The findings also present several intervention and prevention implications. These implications will be discussed at greater length in Chapter VI.

Chapter V: Study 3

I. Methods

Participants

Participants of this study were drawn from a subsample of the Midlife in the United States Study – Wave 2 (MIDUS-2; PI: Carol Ryff). Data for the MIDUS-2 were collected in 2009 as part of a longitudinal follow-up on the MIDUS-1. Data for the MIDUS-1 were collected between 1995-1996, with an intended goal of better understanding behavioral, psychological, and social factors contributing to health and wellbeing in later life. Of the three waves of data collection (MIDUS 1, 2, 3), suicidal thoughts were only assessed in the Biomarker Subsample of MIDUS 2. Of those enrolled in the Biomarker Subsample of the MIDUS-2, a smaller sample of 330 participants were given a neuroscience assessment. This neuroscience sample of 330 participants were utilized for the present studies analysis. Our study focused on this subsample because participants in the neuroscience subsample, but not the larger biomarker sample, were assessed for emotional distress (a key construct in the SPM discussed above).

The 330 participants included in the final analysis for this dissertation were between the ages of 34 and 81 years with a mean age of 52.97 years (SD = 11.39). The sample was approximately evenly divided by gender (147 male, 183 female). In terms of race, the most frequently identified race was European American (208) although a substantial portion of the sample provided no race data (115). The majority of the sample who reported educational outcomes had received a high school diploma or higher: 57 graduate high school (17.3%), 52 graduated college with a baccalaureate degree (15.8%), 34 completing 1 to 2 years of college but with no degree (10.3%), and 37 with a master's degree or higher (11.2%). However, 108 (32.7%) did not report educational outcomes.

Procedures

Access to the MIDUS-2 data was achieved through the Inter-university Consortium for Political and Social Research (ICPSR) database. The ICPSR, housed at University of Michigan, maintains and provides access to social science data for use in research and instruction. The MIDUS data from each of the 3 waves is available through ICPSR. The first wave of data collection (MIDUS-1) took place in 1995-1996 and surveyed 7,108 participants: 3,487 from a national probability sample, 757 over-sampling from select metropolitan areas, 950 siblings of main respondents, and 1,914 national sample of twin pairs.

The second wave of data collection (MIDUS-2), from which our neuroscience subsample stems, began in 2004 and ended in 2006. The retention rate across the subsamples ranged between 65 and 78% (averaging 70%) for a total sample of 4,963. Age and gender did not impact participant retention, though those lost to attrition were more likely to report lower education levels and to be non-white (Choi et al., 2010). Participant data was collected through either phone interviews or self-administered questionnaires.

Measures

Perceived Burdensomeness. Perceived burdensomeness was measured using 8 items drawn from the Mood and Anxiety Symptom Questionnaire (MASQ; Clark & Watson, 1991; Watson et al., 1995a; Watson et al., 1995b) and the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977; Eaton, Smith, Ybarra, Muntaner, & Tien, 2004). Response options for these items ranged from 1 (not at all) to 5 (extremely), or 1 (strongly disagree) to 7 (strongly agree). Responses were standardized before being averaged to compute the perceived burdensomeness measure. The scale had acceptable internal consistency ($\alpha = .79$). High scores corresponded to higher perceptions of perceived burdensomeness. Sample items

include: “During the past week – including today – I felt worthless” and “How much do you agree or disagree with the following statements – I sometimes worry that I am a burden on others?”

Thwarted Belongingness. Thwarted belongingness was measured with 13 items drawn from the Mood and Anxiety Symptom Questionnaire (MASQ; Clark & Watson, 1991; Watson et al., 1995a; Watson et al., 1995b), the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977; Eaton, Smith, Ybarra, Muntaner, & Tien, 2004), and the Positive Events Scale (MacPhilamy & Lewinsohn, 1982). There were several different response options for items on this scale: 1 (never) to 3 (7+ times), 1 (not at all) to 4 (quite a bit), and 1 (not at all) to 5 (extremely). Responses were standardized before averaging to compute the thwarted belongingness score. The scale had acceptable internal consistency ($\alpha = .74$). High scores corresponded to higher perceptions of thwarted belongingness. Sample items include: “During the past week – including today – I felt withdrawn from other people” and “During the past week – I felt lonely.”

Hopelessness. Hopelessness was assessed using 6 items measured on a 1 (never/not at all) to 5 (extremely/very often) scale with three items reverse coded. These items were drawn from the Mood and Anxiety Symptom Questionnaire (MASQ; Clark & Watson, 1991; Watson et al., 1995a; Watson et al., 1995b) and the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983; Cohen & Williamson, 1988). The scale had acceptable internal consistency ($\alpha = .68$). High scores corresponded to higher perceptions of hopelessness. Sample items include: “During the past week – including today – I felt hopeless” and “During the past week – including today – I felt hopeful about the future.” Scores were calculated by averaging items.

Strain to Friends and Family. Two scales were used to measure strain on friends and on family. ***Strain to friends*** was measured using 4 items (α = .64). Items were scored on a 1 (a lot) to 4 (not at all) scale. High scores were indicative of higher perceptions of strain to friends. Sample items include: "How often do you make too many demands on your friends" and "How often do you let your friends down when they are counting on you?" ***Strain to family*** was also measured using 4 items (α = .69). Items were scored on a 1 (a lot) to 4 (not at all) scale. High scores were indicative of higher strain on family. Sample items include: "How often do you make too many demands on your family" and "How often do you let your family down when they are counting on you?" Scores were calculated by averaging items; scales were constructed for use in the MIDUS.

Emotional Distress. Emotional distress was measured as part of an assessment of negative affect. Participants were asked to indicate how they feel on average about several negative affective states. For the purposes of this study the item measuring emotional distress was used. This item asked participants to rate "To what extent you feel distressed right now, that is, at this very moment. Use the following scales to record your answers." Scales were measured on a 1 (very slightly or not at all) to 5 (extremely) scale.

Suicide and Death Ideation. A single item was used to measure the occurrence of suicide and death ideation. Participants were asked to indicate the frequency over the past week in which they experienced recurrent thoughts of death or suicide. This item was measured on a 1 (not at all) to 5 (extremely) scale with higher scores indicating greater occurrence of suicidal and death-related thoughts.

Depression. Depression was measured using 5 items drawn from the Mood and Anxiety Symptom Questionnaire (MASQ; Clark & Watson, 1991; Watson et al., 1995a; Watson et al.,

1995b) and the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977; Eaton, Smith, Ybarra, Muntaner, & Tien, 2004). These items were assessed on a 1 (rarely or none of the time) to 4 (most or all of the time) and 1 (not at all) to 5 (extremely) scales and were standardized before being averaged to compute a depression score. The scale had acceptable internal consistency ($\alpha = .82$). These items were Higher scores on this scale were indicative of greater depressive symptoms. Sample items include: "During the past week – including today – I felt sad" and "During the past week – including today – I felt depressed."

Data Analysis Strategy

Given the objective of exploring a theoretical framework of suicide (i.e., the Social Pain Model), path analysis with AMOS was used (Arbuckle, 2017). Given that path analysis allows for exploring hypothesized causal pathways as well as direct and indirect effects, it ideal for the present study. Figure 10 provides the hypothesized model. As depicted in this model, high experiences of social triggers (e.g., perceived burdensomeness, thwarted belonging, strains on interpersonal relationships) are expected to predict high emotional distress. All social triggers (perceived burdensomeness, thwarted belongingness, strain to friends and strains to family) are hypothesized to be indirectly related to suicidal thoughts through their relation to emotional distress. Additionally, as portrayed in the model, it is expected that there will be an indirect effect of emotional distress on suicidal thoughts through the experience of hopelessness.

II. Results

Sample Characteristics and Bivariate Results

Table 9 shows the sample characteristics and gender differences on study variables. Table 10 depicts the bivariate relationships across variables in the model. As noted in Table 9, males and females differed significantly on three variables: hopelessness, thwarted belongingness, and

perceived burdensomeness. For all three variables, male participants reported higher scores than female participants. Bivariate associations were computed separately by gender. All bivariate relationships were in the expected direction. For male participants, suicidal thoughts shared the strongest associations with emotional distress, depression, thwarted belongingness, perceived burdensomeness, and hopelessness. For female participants, suicidal thoughts shared the strongest associations with emotional distress, perceived burdensomeness, strain to friends, and strain to family. Not consistent with predictions, neither hopelessness nor thwarted belongingness were significantly associated with suicidal thoughts for female participants.

Model Testing

To test the hypothesized model (Figure 10), a path analysis was performed. The overall fit of the model can be assessed using the chi-square statistic; however due to limitations to this fit index (such as susceptibility to sample size), other indices are needed (Byrne, 2001). There are several fit indices computed by AMOS, but prior work has supported the reporting of chi-square, comparative fit indices (CFI), and root-mean-square error of approximation (RMSEA) as sufficient for evaluating model fit (McDonald & Ho, 2002). Figure 11 shows the results of our analysis. Although not shown in the figures, all exogenous variables were permitted to correlate with one another and depression was included as a control variable. Figure 11 illustrates the results of the path analysis. Overall, the model showed good fit. Chi-square goodness-of-fit (X^2 = 5.74, df = 3, p = .13), the comparative fit index (CFI = .997) and the root mean square error of approximation (RMSEA = .053) all indicated good fit. The model explained 28.5% of the variance in emotional distress, 39.2% of the variance in hopelessness, and 23.4% of the variance in suicidal thoughts.

Direct Effects. As can be seen in Figure 10 and consistent with the hypothesized model, perceived burdensomeness and strain to friends had significant direct effects on emotional distress. However, not in line with the hypothesized model, emotional distress had a significant direct effect on suicide and death ideation. Additionally, and not in line with our hypothesized model, was the statistically significant direct effects of perceived burdensomeness and thwarted belongingness on hopelessness. The predicted direct effect of hopelessness on suicide and death ideation was also not supported by the data.

Indirect Effects. In addition to direct effects, indirect effects were also assessed. Indirect effects are the product of two effects and as such it is recommended to view effects of .01 as small, .09 as moderate, and .25 as large (Preacher & Kelley, 2011). Table 10 show the direct, indirect, and total effects of the model. As can be seen in Table 10, there were several modest but significant indirect effects on suicide and death ideations. The indirect effects on suicide and death ideation from perceived burdensomeness and strain on friends are consistent with the SPM. Not in line with the SPM is the non-significance of hopelessness in the model.

III. Discussion

Like Study 2, the present study had a goal of exploring the Social Pain Model (SPM) proposed by Gunn (2017). In Study 2, discussed in Chapter V, the SPM was examined in an undergraduate sample of young adults. The present study expands upon this work by exploring the SPM among a subsample of middle to older adults drawn from the MIDUS-2. This research examines the impact of perceived burdensomeness and thwarted belonging, two social pain triggers according to the SPM, on psychological pain and subsequent suicidal thoughts. Additionally, the influence of strains on friends and strains on family are considered, as two potential social pain triggers. As proposed by the SPM and illustrated in Figure 10, it was

hypothesized that these social pain triggers would result in experiences of psychological pain, which in turn would lead to increased suicidal thoughts indirectly through hopelessness.

Once more partial support was found for the SPM. As can be seen in Figure 11, a number of hypothesized paths were significant. Namely, the experience of perceived burdensomeness and of strains to friends both contributed to the development of psychological pain. However, contrary to the SPM, perceived burdensomeness and thwarted belongingness both had significant direct effects on hopelessness. This finding is more consistent with the Interpersonal-Psychological Theory of Suicide (IPTS) that postulates that perceived burdensomeness and thwarted belongingness would contribute to suicidal thoughts indirectly through hopelessness. Additionally, while the SPM proposes that psychological pain will contribute indirectly to suicidal thoughts through hopelessness, findings supported a direct effect of psychological pain on suicide and death ideation experienced in the sample, inconsistent with either the IPTS or SPM.

There are a few limitations that need to be considered when contextualizing and considering the results of Study 3. Since the data analyzed were collected at a single point in time and despite the illusion of progression from one risk factor to the next that the model suggests, any causative effects are purely speculative. Future work will need to explore the SPM across several time-points to provide stronger evidence that the hypothesized path progresses in this manner. Another limitation that must be considered is the nature of the dependent variable in Study 3. Although Study 1 and 2 focused directly on measures of suicidal thoughts, the present study's dependent variable is a measure of suicide and death ideation. We cannot be certain that participants are having thoughts of suicide or merely thoughts of natural death. However, death ideation has been discussed as part of the continuum of suicidal thoughts

(Lewinsohn, Rohde, & Seeley, 1996; Neeleman, de Graaf, & Vollebergh, 2004) and continues to be used in the field (Walker et al., 2017). Additionally, an examination of bivariate associations between our measure of suicide and death thoughts and our predictors are all in the expected direction given past research and theory. Finally, future work needs to explore the impact of other social pain triggers (such as a sense of defeat or social rejection), capability for suicide, and subsequent suicidal behavior to fully test the SPM. Measures for these were not present within the dataset.

Despite these limitations, however, the present study, alongside Study 2, represents a first step in exploring key aspects of the SPM and provides some support for the theoretical framework. As proposed, two of our social pain triggers (perceived burdensomeness and strain to friends) were associated with increased psychological pain. Additionally, while the SPM proposes an indirect association between psychological pain and suicidal thoughts, finding a direct relation between psychological pain and suicide and death thoughts still lends some support for the overall postulate that suicidal thoughts result from psychological pain. The SPM proposes that a sense of entrapment as well as a sense of hopelessness mediates the association between psychological pain and suicidal thoughts. Future work with a more robust measure of hopelessness and entrapment (i.e., a sense that one cannot escape) may find better support for this mediation in older adult populations. Additionally, future measures should consider the developmental periods under examination and normative life events for individuals within these age ranges. Consistent with Study 2, Study 3 confirms that there is a benefit to further exploring the role of social pain in the development of suicidal thoughts.

Chapter VI: Synthesized Discussion

This dissertation explores the role of suicidogenic cognitions in the development of suicidal thoughts among young and middle-aged adults. The three manuscripts outlined are tied together by a focus on two theoretical frameworks for understanding suicidal behavior, the Interpersonal-Psychological Theory of Suicide (IPTS; Joiner, 2005; Van Orden et al., 2010) and the Social Pain Model (SPM; Gunn, 2017). In Study 1 the role of self-worth, social support, and perceptions of racial discrimination in the development of suicidal thoughts were explored using a longitudinal dataset following adolescents into young adulthood. Self-worth and social support were used as proxy measures for perceived burdensomeness and thwarted belongingness, respectively, two prominent components in the development of suicidal thoughts according to the IPTS. In Study 2 the SPM was explored in a sample of undergraduate students. Here the role of perceived burdensomeness, thwarted belongingness, relational aggression, and physical aggression were investigated as social and physical pain triggers in the onset of psychological pain. Additionally, the role of psychological pain, hypothesized to have an indirect effect on suicidal thoughts through a relation to hopelessness, was also explored. Finally, Study 3 explored the SPM in a cross-sectional dataset of middle to older adults. Here the role of perceived burdensomeness, thwarted belongingness, strain on friends, and strain on family were explored as social pain triggers leading to increased reporting of psychological pain. As with Study 2, the role of hopelessness in mediating the relationship between psychological pain and suicidal thoughts was explored.

Overall, the findings provided mixed support for the role of the above noted predictors in the development of suicidal thoughts. Study 1 found that self-worth, a proxy measure of perceived burdensomeness, was the only significant predictor of suicidal thoughts when past

suicidal thoughts, depression, social support, and perceived racial discrimination were included in the analysis. However, this finding was only significant for European American males and females. Further exploring race and gender differences, heightened risk for suicidal thoughts was also found when self-worth and social support were low among African American females and European American males. This finding is consistent the IPTS. However, we found no effect of an interaction of social support and self-worth among African American males. Additionally, for European American females, findings were inconsistent with the IPTS in that the highest reporting of suicidal thoughts was among those reporting low self-worth and *high* social support. It is not clear why this finding occurred. One possibility is that for European American females, social support facilitated co-rumination, where perceptions of self-loathing (and related thoughts) were repeatedly analyzed. Among younger adolescents, co-rumination has been associated with various challenges with psychosocial adjustment (Rose, 2002; Rose, Carlsons, & Waller, 2007; Schwartz-Mette & Rose, 2012). Although future research would need to confirm possible links between co-rumination and suicidal cognition in young adults (and gender/racial differences), given the gravity of suicide this may be an important link to consider in future research.

For European American males and females, the interaction of self-worth and perceptions of racial discrimination was also a significant risk factor for elevated suicidal thoughts. Those experiencing high perceptions of racial discrimination and low self-worth were at elevated risk of reporting suicidal thoughts. However, the findings for African American males took on two different patterns of risk. The highest risk was among those reporting low self-worth and low perceptions of racial discrimination. This finding may be a result of the differences between perspectives on who will and will not suffer from racial discrimination. For African American

males, the majority of the sample believed they would face at least moderate racial discrimination ($M = 3.12$) while for European American males and females there was more participants who anticipated not experiencing racial discrimination ($M = 1.49$, $M = 1.56$, respectively). Of particular interest, however, was the finding regarding African American males who anticipated high racial discrimination. For this population, high racial discrimination and high self-worth conferred the greatest risk for reporting suicidal thoughts. This finding, although needing replication, seems to indicate that when African American males perceive themselves as having value the strain of racial discrimination increases risk for suicidal thoughts. These young men believe that they are highly capable and worthy, but also believe that their experiences in life will be challenging for them because of their race. This is an extremely frustrating and potentially demoralizing juxtaposition. Future research should explore ways in which to address this conflict. One promising area of research has been on ethnic and racial socialization. Ethnic and racial socialization refers to the transmission of information regarding race and ethnicity from adults to children (Hughes et al., 2006). Research has found that parents engaging in ethnic and racial socialization can help prepare children for future experiences with racial discrimination, thereby reducing the negative effect of such experiences. None of this research, however, has examined whether these types of conversations might be protective against suicidal cognitions and behavior.

Study 2 and 3 provided mixed support for the postulates of the SPM. As anticipated by the SPM, Study 2 found that perceived burdensomeness as a social pain trigger was associated with increased reporting of psychological pain. Also, in line with the SPM, psychological pain indirectly increased reporting of suicidal thoughts through an association with hopelessness. However, not in line with the SPM was the finding that perceived burdensomeness had a direct

effect on suicidal thoughts. Additionally, in contrast to predictions made by the model, several social and physical pain triggers (such as relational aggression, physical aggression, and thwarted belongingness) did not have significant effects on psychological pain. Study 3 provided greater evidence for the role of social pain triggers on the occurrence of psychological pain. Both perceived burdensomeness and strain on friends were associated with increased experiences of psychological pain. However, contrary to expectations, psychological pain had a direct effect on suicidal thoughts and hopelessness did not. Additionally, more in line with the IPTS, perceived burdensomeness and thwarted belongingness were associated with increased reporting of hopelessness. However, neither had a direct effect on suicidal thoughts and their indirect effects were relatively weak, leaving the strongest evidence in support of the role of psychological pain in experiences of suicidal thoughts.

I. Implications for Prevention & Intervention

Research focused on understanding the factors associated with the development of suicidal thoughts are only as useful as the implications for prevention and intervention that they provide. Given the loss of life and the adverse effects on loss survivors and society tied to suicide, it is imperative that the work done to understand the behavior leads to real world implications. This section will review the prevention and intervention implications of the present research. However, caution is urged that further research into the SPM must be completed before it is implemented exhaustively in the field of suicide prevention. To rely on a theoretical framework that is not properly vetted could lead to resources being allocated in error. Therefore, future research is needed and will be discussed following this section.

A number of prevention and intervention implications are suggested by the three studies presented in the current dissertation. Study 1 highlights the need for a more inclusive perspective

when examining risk factors that are often considered established. Although there is a large body of evidence supporting the role of perceived burdensomeness and thwarted belongingness in the development of suicidal thoughts and behaviors, the majority of this work has been focused on cross-sectional datasets (92.3%) that are often majority European American (63.4%; Chu et al., 2017; Ma et al., 2016). Consistent with the IPTS model, Study 1 found a link between low self-worth (which as noted above is one aspect of perceived burdensomeness), and later suicidal thoughts in a sample of young adults transitioning out of high school. However, this link was only significant among European American males and females. Additionally, interactions pointed to the importance of considering additional risk factors by race and gender. Perceptions of racial discrimination coupled with self-worth seemed especially important among African American males. For African American males who saw value in themselves, the anticipation of racial discrimination increased risk of suicidal thoughts. Prevention work needs to consider that a one-size-fits-all methodology is simply not going to suffice across different groups. Suicide as a behavior is multifaceted and risk factors confer risk differently across different groups, and prevention efforts need to reflect this. Culture, gender, socialization variations, and unique social experiences based on others' stereotypes and biases work together to influence the manifestation of different types of thoughts and behavior, and suicide is no exception. Any attempt to explain suicide and prevent it should keep in mind the various systems involved in human behavior (Bronfenbrenner & Morris, 2006).

One finding that was consistent, however, across African American females and European American males was that low self-worth and low social support conferred the greatest risk for reporting suicidal thoughts. Given this confirmation of the dual role of social support and self-worth and previous work examining the protective effect of social support and

connectedness, programs and institutions that instill a sense of belonging may be beneficial to reducing suicidal thoughts. Interventions targeting belonging were recommended by Joiner (2009) for suicide prevention in school settings, and it is likely that a sense of belonging may be the easiest to target in a school setting. For example, youth identifying as lesbian, gay, bisexual, or transgender (LGBT) are at increased risk for experiencing suicidal thoughts and engaging in suicidal behavior. However, the presence of gay-straight alliances at high schools has been linked to lowered risk of suicidal thoughts and behaviors and decreased experiencing of psychological distress (Goodnow, Szalacha, & Westheimer, 2006; Heck, Flentje, & Cochran, 2011).

Although perceived burdensomeness may be difficult to target in prevention efforts, one of its component parts, sense of self-worth or global self-esteem, may be more targetable in school-aged children. There is some evidence that programs targeting global self-esteem (a similar construct to self-worth) can lead to improved self-concepts, though whether these interventions can lead to lasting change is unclear (Knapen et al., 2005; McVey, Davis, Tweed, & Shaw, 2004). There is even more promise in programs that target self-worth that is contingent (i.e., tied to success or performance; Crocker, Brook, Niiya, & Villacorta, 2006). Among older populations, exercise regimens that improve a sense of physical self-worth has also been shown to improve overall self-worth (McAuley, Blissmer, Katula, Duncan, & Mihalko, 2000; Park, Han, & Kang, 2014). Younger populations may also benefit from increased physical activity, as it has been associated with decreased depressive symptoms (Korczak, Madigan, & Colasanto, 2017). Improving self-worth in older populations is important, given its relation to suicidal thoughts and that life trajectories see self-worth increasing in young to middle adulthood but dropping off in older adulthood (Orth, Trzesniewski, & Robins, 2010).

Studies 2 and 3 point toward the importance of psychological pain in understanding the development of suicidal thoughts as well as highlighting the role of various triggers to psychological pain. The strongest evidence, found in both studies, was for the role of perceived burdensomeness in experiences of psychological pain. Given that perceived burdensomeness is a suicidogenic cognition, intervention in a clinical setting would benefit from focusing on cognitive behavioral approaches. Recommendations coming out of the IPTS focus on the assessment of a sense of burdensomeness with clients (Stellrecht et al., 2006). Additionally, clinicians should focus attention on challenging distorted thought patterns associated with perceived burdensomeness (such as "I am a burden on those around me" and "My loved ones would be better off without me"). Cognitive behavioral therapies would be good candidates for challenging these types of cognitions (Stellrecht et al., 2006). These therapies would be used to challenge distorted thinking (such as perceptions of burdensomeness and thwarted belongingness). One such behavioral technique, Cognitive-Behavioral Analysis System of Psychotherapy (CBASP; McCullough, 2003) has been highlighted as particularly applicable as it challenges clients to evaluate their thoughts and behaviors in light of whether they impede or promote desired results (e.g., increasing belongingness, decreasing perceptions of burdensomeness; Stellrecht et al., 2006). In addition to targeting social pain triggers such as perceived burdensomeness, cognitive behavioral approaches would also be useful in targeting a sense of hopelessness and entrapment. Senses of hopelessness and entrapment, according to the SPM, lead those experiencing psychological pain to experience suicidal thoughts, which was partially supported by the present research. By targeting hopelessness and a sense of entrapment, therapists may be able to reduce the likelihood of clients experiencing suicidal thoughts.

Cognitive behavioral techniques have been shown to be effective methods for the treatment of suicidal thoughts as well as behaviors (Rudd et al., 2015).

Finally, some support was also found for measures of thwarted belongingness in reports of psychological pain and hopelessness. Given these findings, some recommendations can also be made with regards to improving a sense of belonging in young adolescents and young adults. Evidence has found that a sense of school connectedness (such as teacher support) has reduced risk of reporting suicidal thoughts and behaviors among adolescents (McNeely & Falci, 2004; Gunn, Goldstein, & Gager, 2018). Research has also found that increases in belonging among undergraduates can decrease internalizing problems and increase a sense of self-worth (Pittman & Richmond, 2008). Increases in a sense of college belonging and engagement in extracurricular activities has also been linked to lowering perceived stress and increasing life satisfaction among college students (Civitci, 2015). Given these findings as well as our own results, increases in a sense of belonging can have a beneficial impact on the lives of adolescents and college students and may have some benefit in the reduction of suicidal thoughts.

II. Implications for Theory

In addition to prevention and intervention implications, the present research also highlights several theoretical implications. With regards to the IPTS, the present findings indicate that it has applicability to understanding the development of suicidal thoughts. One of the prime components of the model, perceived burdensomeness (and low self-worth as a proxy measure of it), was consistently found to be tied to participant reports of suicidal thoughts. However, the ability of the IPTS to explain suicide across racial groups may be less clear. Among African Americans, other factors may interact with key risk factors for suicide put forward by the IPTS. Namely, the experience of racial discrimination or perceptions that one

will experience racial discrimination, may be significant in understanding suicidal behavior among this population. Experiences of discrimination have previously been reported as associated with suicidal thoughts and behaviors (Li, Gee, & Dong, 2018; Walker et al., 2017) as well as to perceived burdensomeness and thwarted belongingness (Wang, Wong, & Fu, 2013). Future discussions of the IPTS must consider the fact that the model is not as simple as: perceived burdensomeness + thwarted belongingness = suicidal thoughts.

The current dissertation also has several implications to consider for the SPM. As Figure 1 indicates, the SPM postulates that a number of social pain triggers will lead to the development of psychological pain. The present study found partial support for this, with perceived burdensomeness in Study 2 and perceived burdensomeness and strain on friends in Study 3 having direct effects on psychological pain. However, this left several anticipated social pain triggers (such as relational and physical aggression) having no effect. It is possible that certain social pain triggers are more impactful on the development of psychological pain and, subsequently, on suicidal thoughts. The work of Eisenberger, Lieberman, and Williams (2003) and Eisenberger and Lieberman (2004), which informed the development of the SPM, focused on social exclusion, rejection, and ostracism. It is possible that the measures used as social pain triggers did not sufficiently explore these experiences. For example, relational victimization as measured in Study 2 may not have been persistent and serious enough to inflict lasting feelings of exclusion, rejection, and ostracism. Alternatively, the participants may have felt these types of feelings fleetingly because of their victimization, but these feelings may have been mitigated by other supportive and accepting social relationships.

Additionally, it is possible that the transition from experiencing psychological pain to suicidal thoughts, mediated by hopelessness, is not as clear cut as the SPM makes it out to be.

Findings from Study 2 supported the role of hopelessness as a mediator between psychological pain and suicidal thoughts, but Study 3 did not find this to be the case. It is possible that a sense of entrapment (i.e., perceiving no way of escape) is more poignant in understanding this transition than is hopelessness. The SPM postulates that the ultimate motivator to suicide is the desire to escape pain and by not assessing perceptions of escape potential the transition from experiencing pain to developing suicidal thoughts may have been missed. Finally, it seems clear that the proposal of perceived burdensomeness as just a type of social pain trigger is insufficient to explain its relation to hopelessness and suicidal thoughts. Study 2 found a direct effect of perceived burdensomeness on suicidal thoughts while Study 3 found a direct effect on hopelessness. It is clear that perceived burdensomeness as a suicidogenic cognition is important to understanding the onset of suicidal thoughts not merely as a trigger for psychological pain. Developmental stage may also contribute to our findings. Study 2, which provided the strongest support for the SPM postulation that psychological pain would indirectly relate to suicidal thoughts through hopelessness, utilized a sample of young adults. While Study 3, which found a direct effect of psychological pain on suicidal thoughts and no significant path from hopelessness to suicidal thoughts, utilized a sample of older adults. Our finding that hopelessness was non-significant among older populations may not be surprising given that previous work. The role of hopelessness in older adult suicide has previously been found to be contingent on depressive symptoms and emotional regulation (Lynch, Cheavens, Morse, & Rosenthal, 2004; Uncapher, Gallagher-Thompson, Osgood, & Bongar, 1998). Future research should explore this possibility in more detail.

III. Limitations and Future Directions

There are a number of limitations that must be addressed with regard to the research conducted for the current dissertation. For one, all three studies outlined in this manuscript focused exclusively on suicidal thoughts. The research presented therefore cannot speak to the transition from suicidal thoughts to suicidal behaviors. Although it is important to understand what contributes to the desire for suicidal thoughts, it is even more important to understand what leads to a transition from thought to behavior (Klonsky & May, 2014). However, despite a need to better understand this transition, data on suicidal behavior is difficult to obtain given the relative rarity of suicidal behavior. Conservative estimates indicate that approximately 25 suicide attempts occur for every 1 death by suicide (Drapeau & McIntosh, 2018). Given that there are 14.5 suicide deaths per 100,000 persons in the United States, this would mean there are approximately 362 suicide attempts for every 100,000 people. Even when large sample of participants are collected, participants who engage in suicidal behavior are still fairly rare. Despite this challenge, future work will need to explore the transition from suicidal thoughts to suicidal behaviors, focused on the capability for suicide and access to means that the SPM postulates as being vital to understanding this transition (Gunn, 2017).

Another limitation to consider regarding the current dissertation is that two of the three studies conducted were cross-sectional in nature. Although the hypothesized models provide an appearance of progression from one construct to another, the cross-sectional aspect of the data does not allow for statements about a temporal progression. Future work will need to explore the SPM using longitudinal data. Studies 2 and 3 also focused solely on hopelessness as a mediator of the association between psychological pain and suicidal thoughts. Future work is needed to explore the suicidogenic cognition of entrapment. Entrapment has previously been linked to

suicidal behavior (Forkmann & Teismann, 2017; Taylor, Gooding, Wood, & Tarrier, 2011) and is hypothesized by the SPM as also contributing to the transition from psychological pain to suicidal thoughts (Gunn, 2017).

Additionally, while Study 1 allowed for an exploration of the impact of race and gender, Study 2 and 3 were largely European American samples with too few members of marginalized groups to make meaningful comparisons. Given the role of social rejection and ostracism in the SPM, future work focusing on marginalized groups, such as members of the LGBTQ+ community, would be highly beneficial. The present research also made use of single item measures of psychological pain. Future research should make use of more robust measures of psychological pain, such as the Psychache Scale, which has been psychometrically tested and shown to be a valid and reliable measure of psychological pain (Holden, Mehta, Cunningham, & McLeod, 2001). Finally, the present studies focused on young adult and middle to late adult populations. Future research would benefit from an examination of the SPM among younger populations, specifically adolescence. Adolescence is a period of heightened focus on social status in which experiences of social rejection and ostracism may be particular problematic (Gunn & Goldstein, 2016). Given the focus on social rejection and ostracism as triggers for psychological pain, research focusing on this developmental period could shed much needed light on this theoretical framework.

IV. Conclusion

This work sets out to explore the role of several risk factors for the development of suicidal thoughts in samples representing early, middle, and later adulthood. Study 1 explored the roles of self-worth, social support, and perceptions of racial discrimination among a diverse sample of African American and European American young adults measured over two waves of

data collection. Findings partially supported the combined role of low self-worth and low social support in increased risk for reporting suicidal thoughts. Additionally, among African American males it was found that not only low self-worth, but also high self-worth, when combined with high perceptions of racial discrimination, conferred increased risk for suicidal thoughts. Study 2 examined the Social Pain Model (SPM; Gunn, 2017) among a sample of young adults. Findings partially supported the model, with perceived burdensomeness contributing to increased psychological pain. Psychological pain, in turn, had an indirect effect on suicidal thoughts mediated by hopelessness. Finally, Study 3 also explored the SPM, this time with a sample of middle to late adult participants. Once more, partial support was found for the SPM, with perceived burdensomeness and strain on friends leading to increased reporting of psychological pain. However, psychological pain had a direct effect on suicidal thoughts, and its effect was not mediated by hopelessness. The research highlighted in this manuscript significantly adds to the understanding of the development of suicidal thoughts by exploring hypothesized risk factors of two theoretical frameworks for suicide. Findings point to the need for an inclusive approach to suicide research that takes into account race and gender differences as well as an increased focus on psychological pain as a contributing factor to the experience of suicidal thoughts.

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Tables & Figures

I. Tables

Table 1
MADICS participants Wave 5 & 6

		Wave 5 %	Wave 6 %
GENDER			
	Males	49.6	51.8
	Females	49.5	47.7
SES			
	Semi-skilled	8.7	9.6
	Skilled	36.0	36.7
	Professional	25.8	23.5
	Advanced Professional	15.9	16.5
RACE			
	African American	57.2	57.8
	European American	32.2	31.6
	Asian	2.1	2.3
	Latino/a	1.3	1.1
	Biracial: Black/European American	2.1	1.8
	Biracial: European American/Other	1.0	1.4
	Biracial: Black/Other	2.5	2.6
	Other	0.7	0.8
COLLEGE			
	College (full-Time)	62.2	53.6

Table 2:
Descriptive Statistics for all study variables by Sex and Race

				Mean (SD)			
				African American		*European American*	
	F, Gender	*F, Racial Group*	*F, Interaction*	*Females*	*Males*	*Females*	*Males*
Suicidal thoughts							
Wave 5	1.37	4.37*	0.53	1.24 (.71)	1.26 (.72)	1.11 (.39)	1.20 (.48)
Wave 6	0.09	0.00	1.55	1.17 (.53)	1.22 (.71)	1.23 (.67)	1.16 (.47)
Self-Worth	0.63	0.28	0.07	2.87 (.41)	2.85 (.43)	2.90 (.35)	2.86 (.36)
Depression	8.28**	1.05	0.77	1.31 (.44)	1.39 (.46)	1.25 (.32)	1.38 (.43)
Social Support	7.91**	9.59**	19.05***	2.91 (.76)	3.00 (.88)	3.36 (.77)	2.92 (.78)
Perceptions of racial discrimination	3.16	790.84***	0.12	2.98 (.74)	3.09 (.71)	1.55 (.54)	1.62 (.64)

* $p < .05$
** $p < .01$
*** $p < .001$

Table 3
Bivariate associations among study measures, African American Males & Females

	1	2	3	4	5	6
1. Suicide Ideation (5)	-	.32***	.40***	-.51***	.04	-.19*
2. Suicide Ideation (6)	.20*	-	.21**	-.37***	-.01	-.13
3. Depression (5)	.42***	.22*	-	-.59***	-.23*	.08
4. Self-Worth (5)	-.48***	-.30***	-.68***	-	.10	.10
5. Social Support (5)	.06	-.01	-.01	.02	-	-.07
6. Perceptions of Racial Discrimination (5)	.08	.06	.09	-.07	.11	-

* p < .05
** p < .01
*** p < .001
Note: numbers in parentheses represent waves of data collection. Top half of table are bivariate relationships among African American males, lower half are bivariate relationships among African American females.

Table 4
Bivariate associations among study measures, European American Males & Females

	1	2	3	4	5	6
1. Suicide Ideation (5)	-	.22*	.46***	-.29**	-.12	-.17
2. Suicide Ideation (6)	.15	-	.29**	-.44***	-.19	-.12
3. Depression (5)	.41***	.30**	-	-.56***	.07	.04
4. Self-Worth (5)	-.43***	-.44***	-.55***	-	-.02	.07
5. Social Support (5)	.12	.07	-.12	-.13	-	-.05
6. Perceptions of Racial Discrimination (5)	-.02	-.04	.05	.002	-.12	-

* p < .05
** p < .01
*** p < .001
Note: numbers in parentheses represent waves of data collection. Top half of table are bivariate relationships among European American males, lower half are bivariate relationships among European American females.

Table 5:
Hierarchical Regressions Predicting Suicidal Thoughts (6), by Gender and Race

	Suicidal Thoughts (6)							
	AA Females		*AA Males*		*EA Females*		*EA Males*	
Predictors	**β**	***B***	**β**	***B***	**β**	***B***	**β**	***B***
Suicidal thoughts (5)	0.07	0.05	0.17	0.17	-0.08	-0.14	0.03	0.03
Depression (5)	0.02	0.02	-0.03	-0.04	0.12	0.25	0.08	0.09
Self-worth (5)	-0.25	-0.32	-0.30	-0.49	-0.41**	-0.76**	-0.39*	-0.51*
Social Support (5)	-0.01	-0.01	0.001	0.001	0.04	0.03	-0.21	-0.13
Perceptions of Racial Discrimination (5)	0.04	0.03	-0.06	-0.06	-0.04	-0.05	-0.11	-0.08
Social support*self-worth (5)	0.34**	0.60**	-0.15	-0.25	-0.41***	-0.76***	0.39***	0.89***
Social support*perceptions of racial discrimination (5)	0.06	0.04	0.06	0.05	-0.03	-0.02	0.02	0.01
Self-worth*perceptions of racial discrimination (5)	0.12	0.14	0.82***	1.30***	-0.60**	-0.98**	-1.02***	-1.28***

* p =/< .05
** p =/< .01
*** p =/< .001

Notes: Numbers in parentheses represent data collection wave. **β** = standardized coefficients, ***B*** = unstandardized coefficients. AA = African American, EA = European American.

Step 1: Suicidal thoughts (5), Depression (5), Self-worth (5), Social support (5), Perceptions of Racial discrimination (5)

Step 2: Social support*self-worth (5), Social support*perceptions of racial discrimination (5), self-worth*perceptions of racial discrimination (5)

Table 6
Gender Differences Across Study Variables

	Females		**Males**		
	M	***SD***	***M***	***SD***	***t*-test**
Psychological Pain	3.05	1.89	3.05	1.93	0.02
Suicidal Thoughts	0.43	1.14	0.21	0.78	-1.35
Relational Aggression	1.97	1.06	2.01	1.18	0.27
Perceived Burdensomeness	1.51	1.06	1.47	0.85	-0.26
Loneliness	2.13	0.55	2.10	0.59	-0.41
Hopelessness	3.02	3.73	3.69	3.95	1.13
Social Support	5.79	1.07	5.57	1.19	-1.36
Depression	0.83	0.71	0.76	0.60	-0.63

*p < .05
**p < .01

Table 7:
Bivariate associations across study variables by gender.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1. Psychological Pain	-	.45***	.64***	.40***	.56***	.47***	.51***	-.32***	.22**
2. Suicidal Thoughts	.37**	-	.54***	.42***	.67***	.42***	.58***	-.33***	.30***
3. Depression	.36**	.50***	-	.44***	.61***	.53***	.58***	-.31***	.30***
4. Relational Aggression	.27*	-.04	.25	-	.38***	.39***	.26***	-.34***	.55***
5. Perceived Burdensomeness	.37**	.35**	.68***	.14	-	.54***	.69***	-.39***	.27***
6. Loneliness	.41***	.45***	.56***	.09	.47***	-	.48***	-.65***	.21**
7. Hopelessness	.32*	.51***	.56***	.18	.45***	.45***	-	-.30***	.14
8. Social Support	-.24	-.36**	-.43***	-.17	-.41***	-.68***	-.24	-	-.17*
9. Physical Aggression	.33*	-.08	.08	.88***	.14	.05	.17	-.08	-

Note: Table split by males (lower half of table) and females (upper half of table).
*$p < .05$
** $p < .01$
*** $p < .001$

Table 8
Standardized Direct, Indirect, and Total Effects

Predictor	Dependent variable	Direct Effects	Indirect Effects	Total Effects
Social Support	Psychological Pain	.07	---	.07
	Hopelessness	---	.05(s)	.05
	Suicidal Thoughts	-.06	.01(s)	-.05
Loneliness	Psychological Pain	.18**	---	.18
	Hopelessness	.03	.12(m)	.15
	Suicidal Thoughts	-.01	.04(s)	.03
Depression	Psychological Pain	.35***	---	.35
	Hopelessness	---	.23(m)	.23
	Suicidal Thoughts	.13	.06(s)	.20
Relational Aggression	Psychological Pain	.06	---	.06
	Hopelessness	---	.04(s)	.04
	Suicidal Thoughts	.09	.01(s)	.10
Physical Aggression	Psychological Pain	.01	---	.01
	Hopelessness	---	.01	.01
	Suicidal Thoughts	-.01	.002	-.01
Perceived Burdensomeness	Psychological Pain	.21***	---	.21
	Hopelessness	.26***	.14(m)	.39
	Suicidal Thoughts	.34***	.09(m)	.43
Psychological Pain	Psychological Pain	---	---	---
	Hopelessness	.67***	---	.67
	Suicidal Thoughts	.04	.14(m)	.18
Hopelessness	Psychological Pain	---	---	---
	Hopelessness	---	---	---
	Suicidal Thoughts	.21***	---	.21

Note: Significance tests are only reported for direct effects.
*p<.05
**p<.01
***p<.001
(s)small, (m)medium, (l)large indirect effects

Table 9

Bivariate associations among variables

	1	2	3	4	5	6	7	8
1. Suicide & Death Ideation	-	.40***	.28***	.14	.13	.30***	.29***	.25***
2. Emotional Distress	.45***	-	.44***	.29***	.19**	.44***	.32***	.27***
3. Depression	.45***	.54***	-	.56***	.49***	.60***	.19*	.24***
4. Hopelessness	.36***	.49***	.72***	-	.5***	.59***	.18*	.19**
5. Thwarted Belonging	.38***	.37***	.59***	.60***	-	.50***	.22**	.21**
6. Perceived Burdensomeness	.38***	.50**	.78***	.76***	.63***	-	.22**	.38***
7. Strain to Friends	.12	.17*	.18*	.23**	.19*	.21**	-	.60***
8. Strain to Family	.18*	.18*	.23**	.22**	.30***	.27***	.68***	-

*p < .05

**p < .01

*** p < .001

Note: Lower half of table represent bivariate relationships for male participants, top half bivariate relationships for female participants.

Table 10
Standardized direct, indirect, and total effects

Predictor	Dependent Variable	Direct Effects	Indirect Effects	Total Effects
Depression	Emotional Distress	.31***	---	.32
	Hopelessness	.14	.15(m)	.29
	Suicide & Death Ideation	.19*	.07(s)	.25
Emotional Distress	Emotional Distress	---	---	---
	Hopelessness	.47	---	.47
	Suicide & Death Ideation	.30***	-.05(s)	.25
Hopelessness	Emotional Distress	---	---	---
	Hopelessness	---	---	---
	Suicide & Death Ideation	-.10	---	-.10
Thwarted Belongingness	Emotional Distress	-.07	---	-.07
	Hopelessness	.17**	-.03(s)	.14
	Suicide & Death Ideation	.10	-.03(s)	.07
Perceived Burdensomeness	Emotional Distress	.26***	---	.26
	Hopelessness	.27*	.12(m)	.39
	Suicide & Death Ideation	.09	.04(s)	.13
Strain to Friends	Emotional Distress	.16**	---	.16
	Hopelessness	---	.08(s)	.07
	Suicide & Death Ideation	---	.04(s)	.04
Strain to Family	Emotional Distress	-.05	---	-.05
	Hopelessness	---	-.02(s)	-.02
	Suicide & Death Ideation	---	-.01(s)	-.01

Note: (s)small, (m)medium, (l)large indirect effects
*p < .05
**p < .01
***p < .001

II. Figures

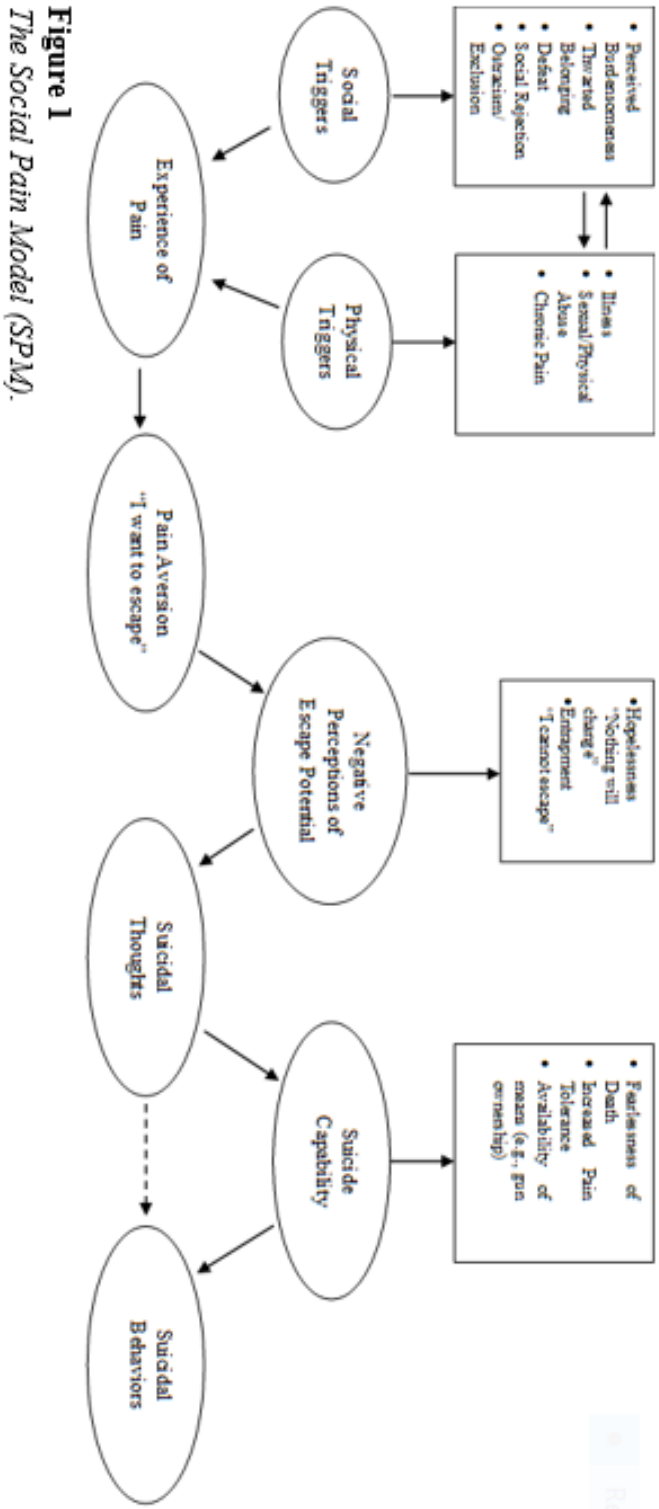

Figure 1

The Social Pain Model (SPM).

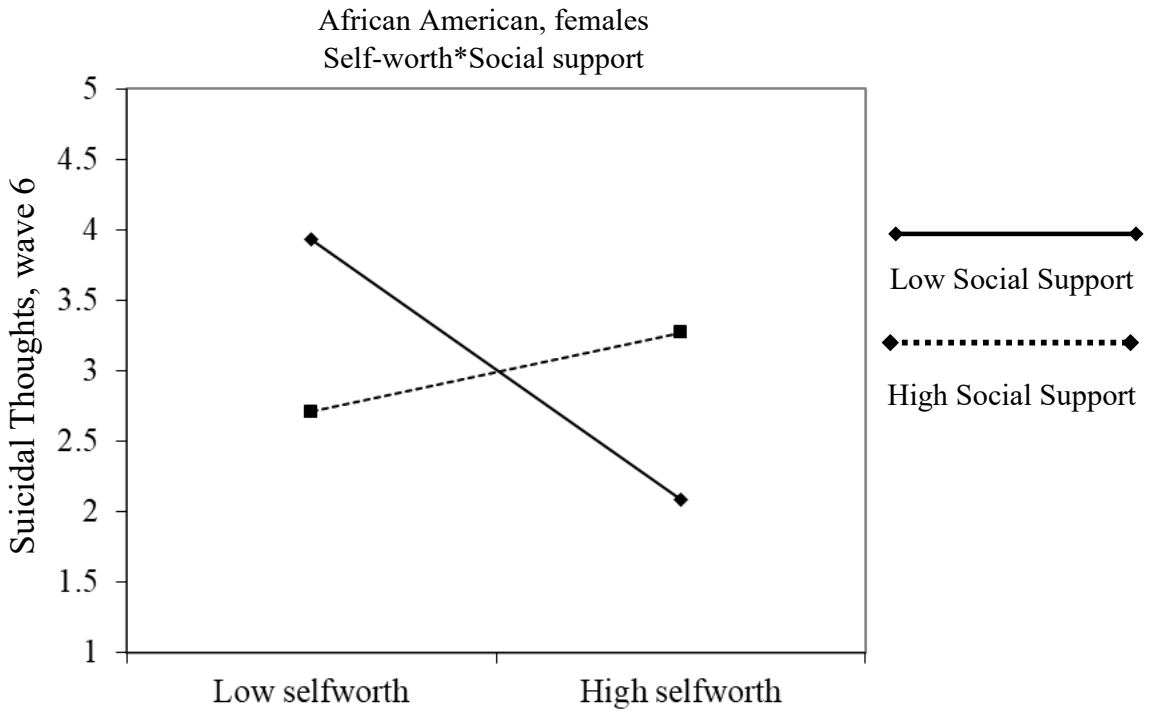

Figure 2
Interaction of self-worth (5) and social support (5) among African American females

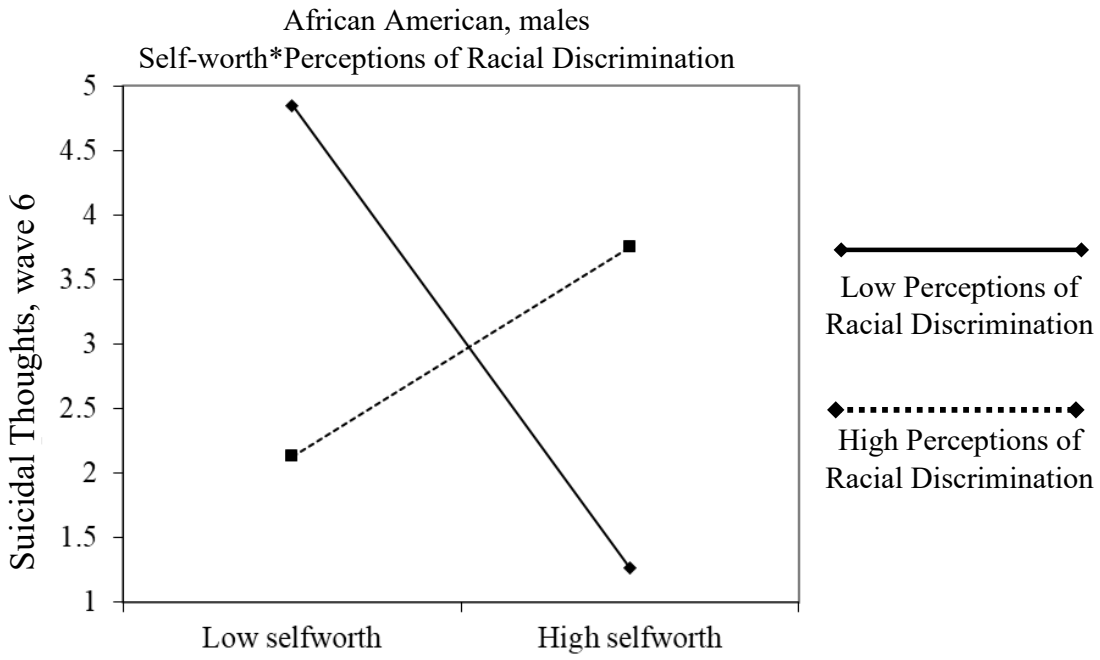

Figure 3

Interaction of self-worth (5) and perceptions of racial discrimination (5) among African American males

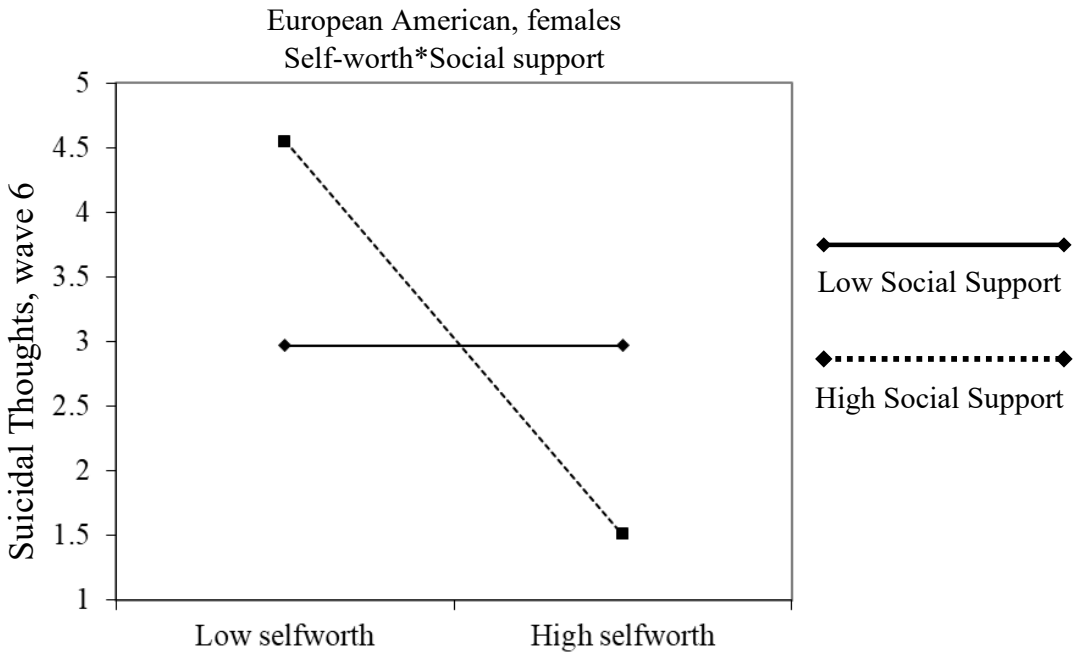

Figure 4

Interaction of self-worth (5) and social support (5) among European American females

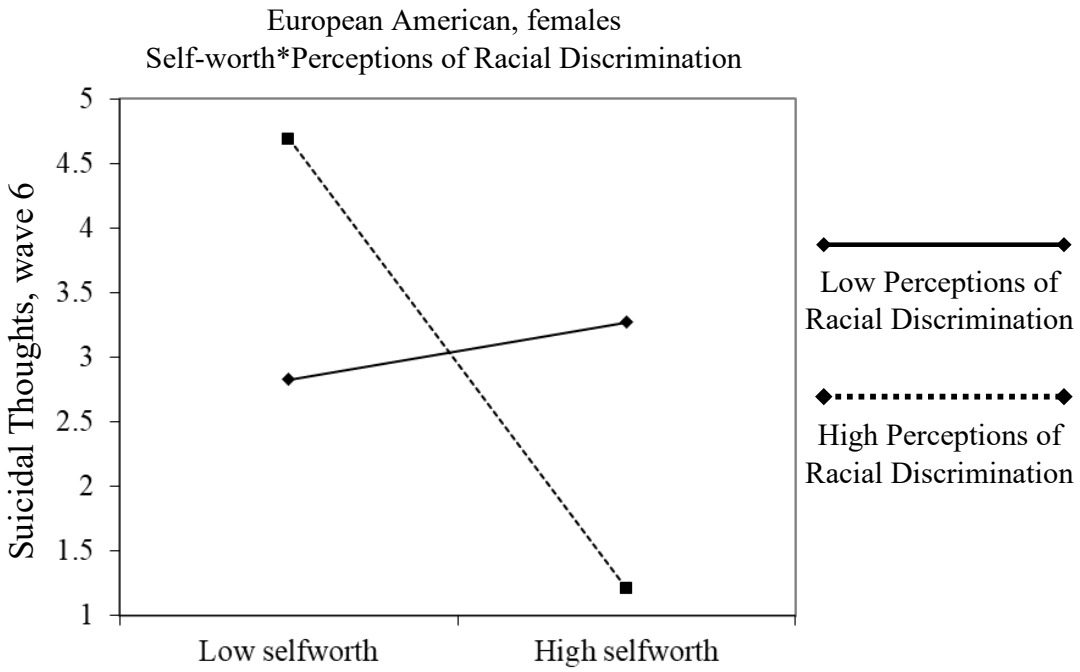

Figure 5

Interaction of self-worth (5) and perceptions of racial discrimination (5) among European American females

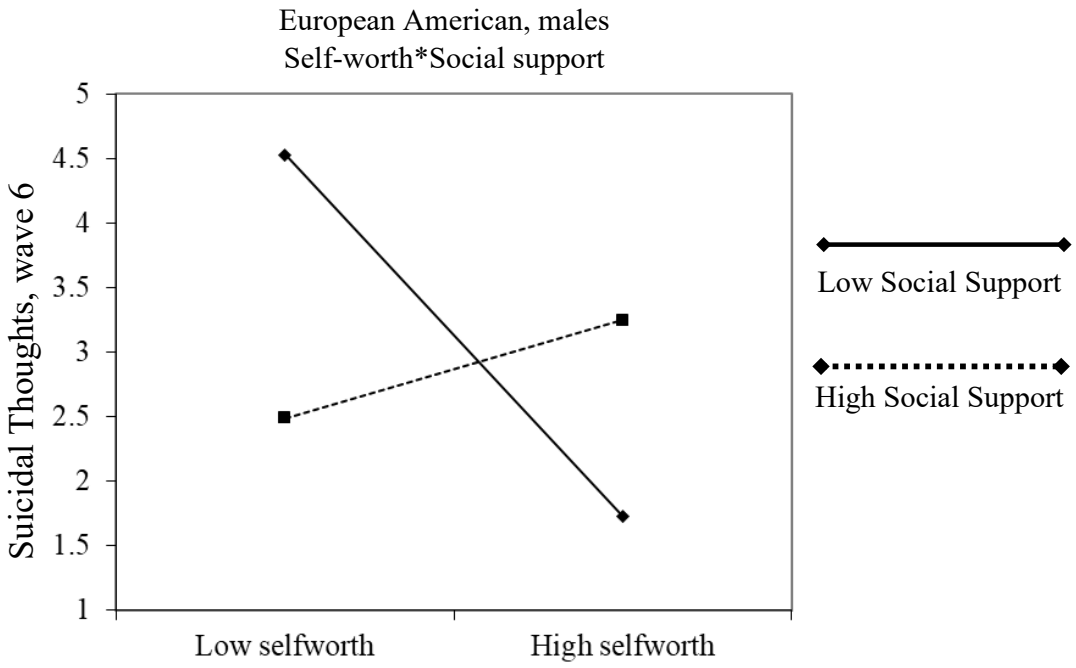

Figure 6
Interaction of self-worth (5) and social support (5) among European American males

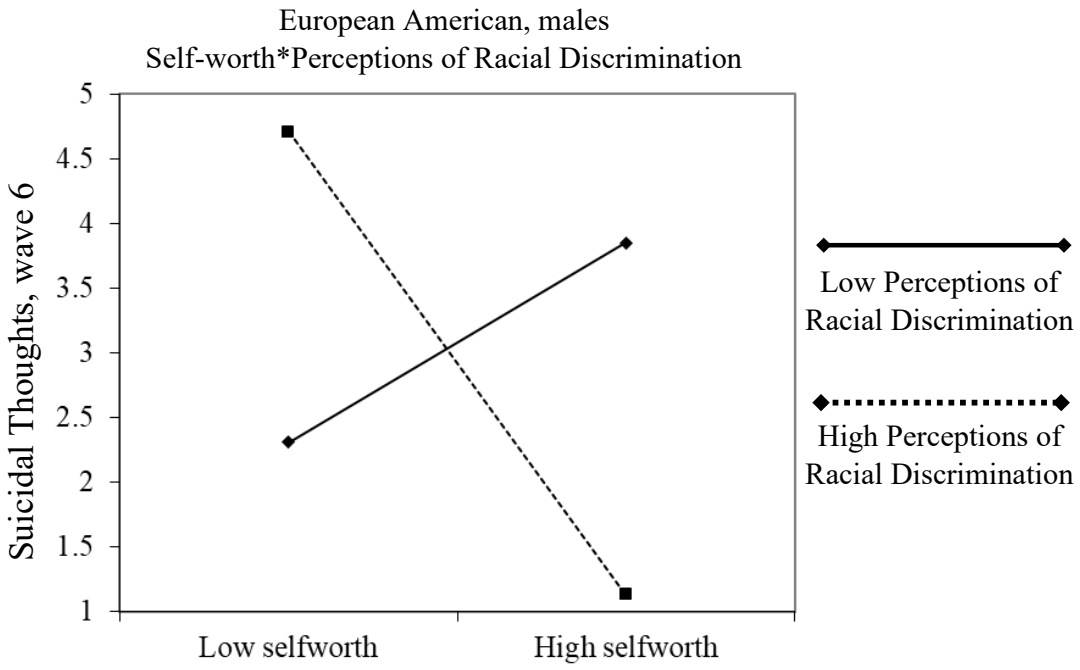

Figure 7

Interaction of self-worth (5) and perceptions of racial discrimination (5) among European American males

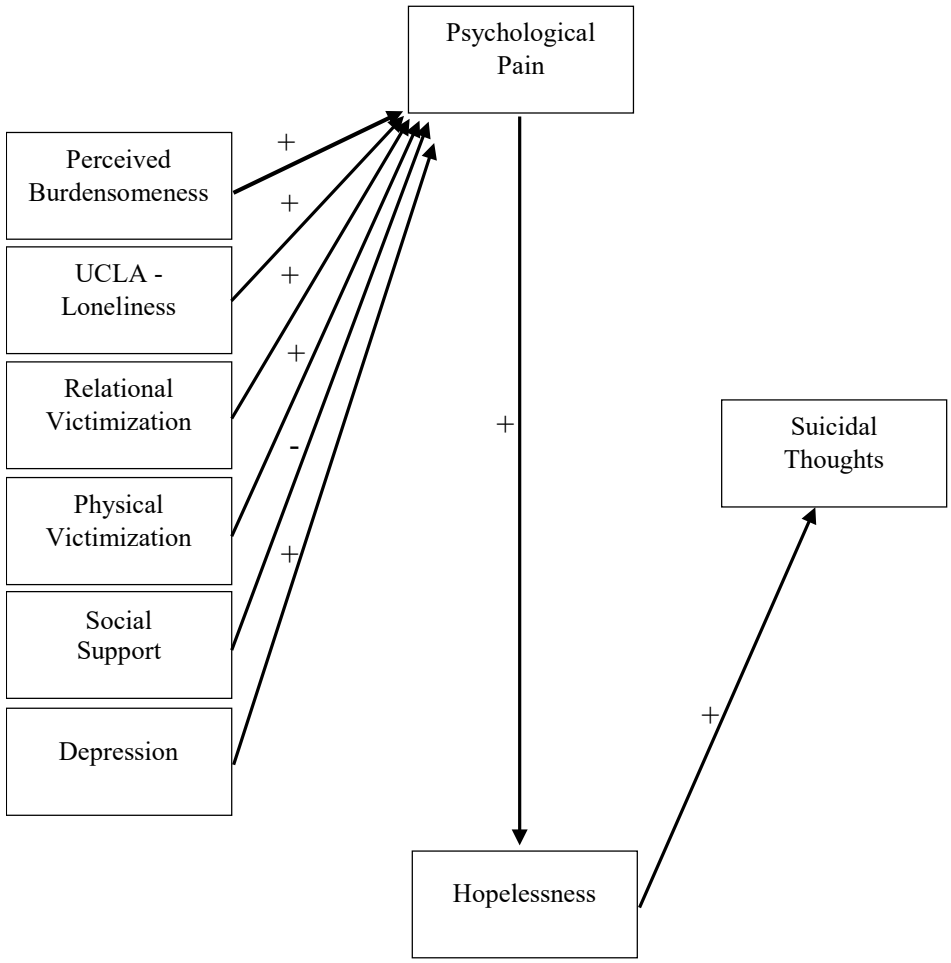

Figure 8
Hypothesized model

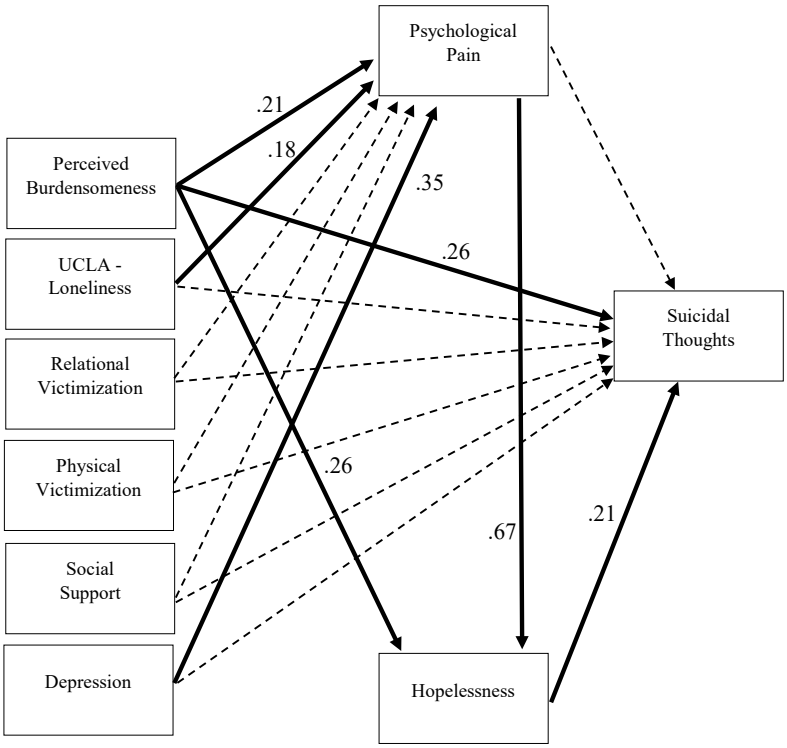

Figure 9
Test of the Hypothesized Model
Note: Solid lines represent significant paths ($p < .05$), dotted lines represent non-significant paths ($p > .05$).
Model fit: $X^2 = 7.64$, CFI = ,995 RMSEA = .078

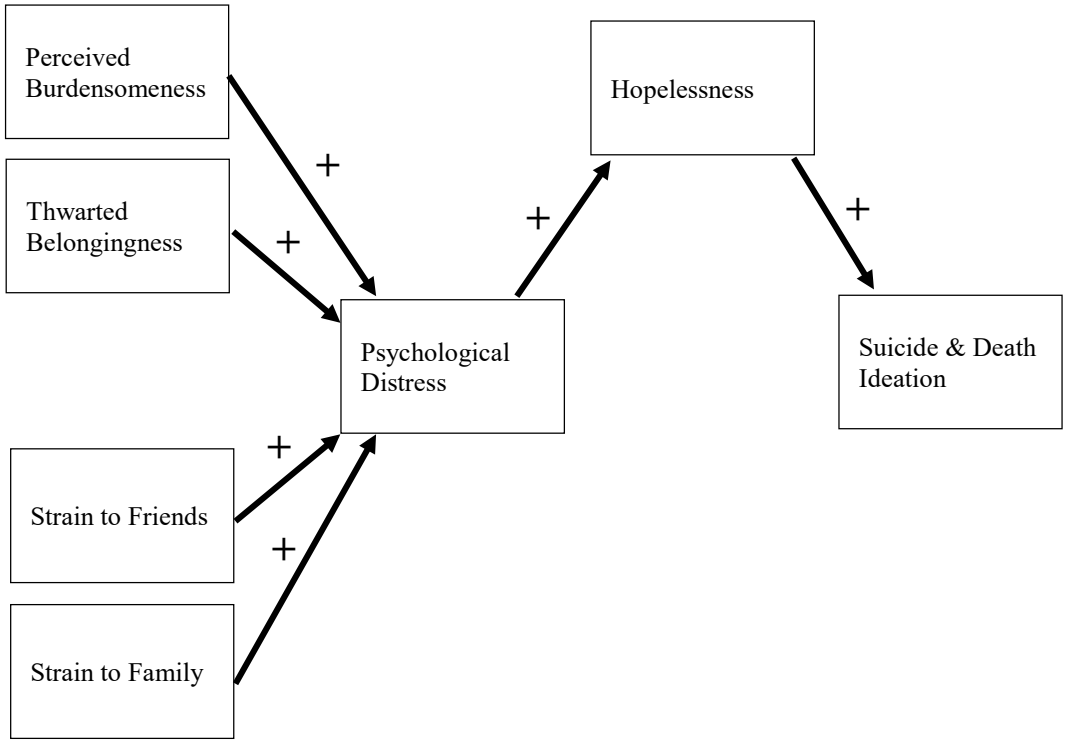

Figure 10
Hypothesized Model

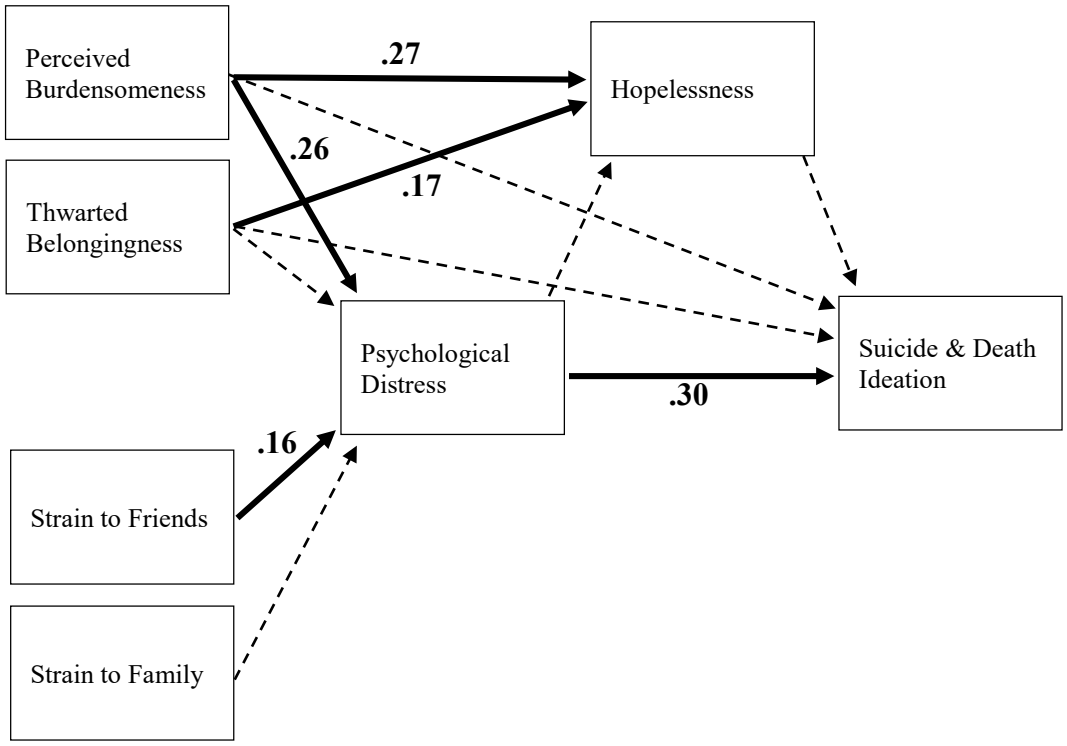

Figure 11
Path Model Results
Note: $Chi^2 = 5.74$, $df = 3$, $p = 0.13$, CFI = 0.997, RMSEA = 0.053

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