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Suicide-Related Imagining and Acquired Capability: Investigating the Role of Imagery in Self-Harm Behaviors

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SUICIDE-RELATED IMAGINING AND ACQUIRED CAPABILITY:
INVESTIGATING THE ROLE OF IMAGERY IN SELF-HARM BEHAVIORS

A Thesis
Presented to
The Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Master of Arts

By
Tara C. Holaday

December 2013

SUICIDE-RELATED IMAGINING AND ACQUIRED CAPABILITY:
INVESTIGATING THE ROLE OF IMAGERY IN SELF-HARM BEHAVIORS

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SUICIDE-RELATED IMAGINING AND ACQUIRED CAPABILITY:
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The purpose of this investigation was to examine the role of suicide-related mental imagery in suicidal behavior. It was hypothesized that engagement (frequency, emotional impact, vividness, realism) with suicidal imagery would be related to suicidality, with greater engagement with imagery associated with more suicidal behaviors. Acquired capability for suicide was expected to be a mediator of this relationship. These hypotheses were tested by surveying 237 undergraduate university students (59% female; mean age = 20). Students completed a packet of self-report measures: The Modified Suicidal Cognitions Interview, The Acquired Capability for Suicide Scale, and the Self-Harm Behavior Questionnaire. Results suggested that engagement with suicide-related imagery was positively correlated with suicidality. The correlational analyses showed that an additional mediational analysis was unwarranted. The implications of these findings are that understanding suicide-related mental imagery could play an important role in clinical risk assessment and treatment for suicidality, and that further research is needed to clarify the mechanisms underlying the relationship between suicide-related mental imagery and suicidal behavior.

Introduction

The irreversible nature and far-reaching consequences of suicide make it a particularly pressing health concern. Suicide is one of the leading causes of death in the United States and much of the industrialized world. Every day about 80 people in the United States alone take their own lives (Joiner, 2005). This translates to over 30, 000 people per year. Although this number represents only 0.01% of the American population (American Association of Suicidology, 2009), suicidal thoughts and attempts occur with a much greater frequency. The results of nationally representative studies suggest that 3.3% of American adults seriously consider suicide each year, while 1.0% of the population will develop a plan for suicide, and 0.6% will attempt suicide (Centers for Disease Control and Prevention [CDC], 2011; Goldsmith, Pellmar, Kleinman, & Bunny, 2002; Kessler, Berglund, Borges, Nock, & Wang, 2005).

Suicide attempts and suicidal thoughts are of serious concern to both clinicians and their clients, but it is important for a counselor to be able to distinguish between people who are a serious threat to their own safety and those who are severely depressed but are unlikely to harm themselves (Joiner, 2005). Clients who are in imminent danger of harming themselves need to be hospitalized. However, this course of action is neither advisable nor feasible for the vast majority of clients who present with suicidal thinking. These individuals need intervention in the form of therapy and/or antidepressant medication. For these clients, hospitalization would be costly, unnecessary, and potentially harmful to the therapist/client relationship (Bryan, 2006; Wingate, Joiner, Walker, Rudd, & Jobes, 2004).

Consequently, a large body of research has been aimed at determining indicators of suicidal risk. The list of empirically demonstrated risk factors of suicide is extensive: age, gender, mental disorder, unemployment, physical illness, previous suicide attempts, family conflict, seasonal variation, hopelessness, homelessness, impulsivity, incarceration, combat exposure, and childhood abuse (Van Orden et al., 2010). Nevertheless, there are only a few theoretical models that seek to explain why and how these particular factors confer an increased risk for suicide (Prinstein, 2008).

Moreover, all of the current models leave many known facts about suicide unexplained. For example, biological theories propose a stress-diathesis model of suicide. In this conceptualization, suicidal behavior occurs when an individual with a specific serotonin system dysfunction encounters a particularly stressful life event (Mann, 2003). This theory explains an important link between neurochemistry and suicidal behavior, but fails to account for the wide variety of other factors that have been identified as risk factors for suicide such as age, gender, and ethnicity. In addition, current models posit that suicidal behaviors (e.g., thoughts, non-lethal attempts, and completed suicide) represent a unitary construct while the data suggest there are meaningful differences among such behaviors (Van Orden et al., 2010). Various cognitive-behavioral theories have hypothesized that hopelessness, emotion dysregulation, and feelings of entrapment cause suicidal behavior (Van Orden et al., 2010). Many people who suffer from mental illness (e.g., bipolar disorder, major depressive disorder, borderline personality disorder, and schizophrenia) have these deficits and experience these feelings, yet the vast majority of these people do not die by suicide.

The Interpersonal Theory of Suicide and Acquired Capability for Suicide

The Interpersonal Theory of Suicide (Joiner, 2005) is the first model that attempts to explain why only a very small fraction of severely depressed individuals actually carry through with a suicide attempt. Joiner (2005) hypothesizes that people who die by suicide possess more than the desire to die. They have also developed the ability to conquer their own instinctual drive for survival. Joiner (2005) calls this habituation to the fear of death the acquired capability for self-injury. When individuals with this capability also experience profound feelings of alienation and burdensomeness, suicides occur (Joiner, 2005). Some cognitive models assert similar psychological preconditions for suicide, but Joiner's framework is the only model that contends that few people are actually *capable* of committing suicide (Van Orden et al., 2010). Joiner's construct of acquired capability for suicide explains previously perplexing information about suicidal behavior in a manner that is precise enough to permit scientific falsifiability and confer clinical utility.

Suicide is commonly viewed by the general public as an act of either cowardice or impulse, but Joiner (2005) argues that the ability to take one's life requires an individual to conquer the strongest of all human drives—self-preservation. A human being is not born with the ability to complete such an act and a vast majority of people will never obtain the capability to attempt suicide (Joiner, 2005). The cues associated with suicidal thoughts and actions are related to stimuli that have repeatedly threatened survival of humans in the past and, therefore, the human fear system has evolved to respond to these cues. An individual must overcome his or her natural response to these stimuli, and experience a state of fearlessness in order to take his or her own life (Smith, Cukrowicz,

Poindexter, Hobson, & Cohen, 2010). In other words, the acquired capability component of the model is centered on the basic premise that the act of suicide is extraordinarily difficult.

Another less self-evident premise underlying Joiner's theory of acquired capability for suicide is based on Solomon and Corbit's (1974) theory of opponent processes. The opponent processes theory is based on the assumption that the human brain constantly strives toward emotional equilibrium. Therefore, if humans are repeatedly exposed to a stimulus or related stimuli that elicits a particularly intense emotional response, an *opponent process* is activated to help neutralize this response. Repeated exposure to life-threatening stimuli attenuates an individual's natural fear response and intensifies his or her potential to experience rewarding sensations.

Existing anecdotal and empirical evidence support a mediating role for fear in suicidal behaviors. As Joiner's theory would predict, suicidal ideators report higher levels of fear about suicide than suicide attempters (Linehan, Goodstein, Nielsen, & Chiles, 1983). Both groups report fear of suicide as one of the reasons they are still alive (Linehan et al., 1983). Despite severe depression and a strong desire to die, people who die by suicide often require several rehearsal attempts before building up enough courage to end their lives (Joiner, 2005). For example, people who kill themselves by jumping from great heights commonly visit their chosen bridge, rooftop, or cliff several times before they are capable of actually taking the leap. On the first visit, they might only look out over a railing. On the second visit, they might place a single leg on the other side of the barricade. Each visit they will come closer and closer to jumping until they have sufficiently habituated to the fear of completing the act and are able to jump (Joiner,

2005). Autopsies commonly reveal alcohol and other drugs in the blood stream of suicide victims (Haywood, Zubrick, & Silburn, 1992; Laws & Turner, 1993). These drugs lower inhibitions and heighten impulsivity, increasing the chance that an individual will have the capacity to reach a state of sufficient fearlessness.

Acquired capability also provides a greater understanding of why seemingly disparate groups of people are at an increased risk of suicide. Athletes, physicians, men, and people with Body Dysmorphic Disorder (BDD) have a higher suicide rate than most of the population (Joiner, 2005). The common factor that is shared among individuals in these groups is increased exposure to physical pain and provocative experiences. Athletes suffer more injuries than non-athletes, and they have learned to value the ability to push their bodies to their limits. Physicians are constantly surrounded by death and injury. They are also knowledgeable about which methods of suicide are most likely to be lethal, and they frequently handle potentially dangerous drugs and medical instruments. Men are more likely to have a history of physical injuries because of higher rates of participation in contact sports than women. They are also more likely to experience provocative situations due to societal standards that sanction higher levels of aggression for males than females (Joiner, 2005). People suffering from BDD would be predicted to have an elevated suicide rate due to having a diagnosable mental illness and being at increased risk for many other comorbid disorders. However, previous theories have failed to explain why the suicide rates for people suffering from BDD are particularly high, even in comparison to people suffering from other mental disorders (Phillips, 1999). Joiner (2005) hypothesizes that a high rate of cosmetic surgeries in this

population explains their elevated suicide rate. Experiences with these painful procedures have allowed them to habituate to fear and discomfort.

Direct Investigations of the Acquired Capability for Suicide

There is an increasing amount of empirical support from studies that directly test Joiner's construct of acquired capability. The line of reasoning that guided the earliest of these studies was the following: If acquired capability is truly a prerequisite of suicide attempts and suicides, then the construct should be able to distinguish between suicide ideators and those who take suicidal action. Furthermore, acquired capability should rise with increasing suicide attempts. Multiple attempters should be distinguishable from single attempters on a number of factors related to acquired capability because they have had increased exposure to painful and provocative events. According to Joiner's (2005) theory, this extra exposure should lead to diminished fear and pain sensitivity in response to suicidal cues.

Rudd, Joiner, and Rajab (1996) found these expected differences. They designed a study that compared 134 current suicide ideators, 128 people who had recently made their first suicide attempt, and 68 people who had recently attempted suicide for at least the second time. The three groups were assessed on a wide variety of personality characteristics and depressive/suicidal symptoms. On both self-report and clinician-rated scales of risk for suicide, multiple attempters experienced more suicidal symptoms than those who had recently made their first attempt and those who had only thought about suicide. Multiple attempters reported greater intensity and duration of suicidal thinking, greater desire to die, higher hostility, and higher impulsiveness. The fact that participants in each of the three groups were the same age and were all in a suicidal crisis at the time

of the study were marked strengths of the research design. The differences that were observed could not be better accounted for by differences in age or differences in why the participants were selected to take part in the study. These findings have since been replicated in a number of additional studies (Brown et al., 2005; Joiner, Rudd, Rouleau, & Wagner, 2000; Smith et al., 2010).

Nevertheless, Rudd et al. (1996) did not account for many of the variables that could be responsible for the correlation between the number of past suicide attempts and present suicide risk. For example, this association might only exist because those who have attempted suicide multiple times have suffered with Major Depressive episodes over a longer period of time than suicidal ideators and single attempters. To address this weakness, Joiner et al. (2005) conducted a study to determine if past suicide behavior predicted present suicidality even when taking into account a multitude of additional factors that had previously been linked to an increased risk of suicide. This relationship was tested across four populations that varied according to gender distribution, age, clinical severity, and geographic location (three of the populations lived in the United States and one lived in Brazil). Nevertheless, the findings were very similar in all four studies. Even when accounting for many other variables known to have a strong association with suicide risk (age, gender, marital status, ethnicity, family history of suicide, current and past diagnoses of depression and bipolar disorder, hopelessness, borderline personality symptoms, alcohol dependence symptoms, negative life events, etc.), past suicidal behaviors had a strong association to suicide attempts. None of the other factors included in the study retained as high a correlation with present suicidality when they were controlled for by other variables. The researchers' decision to include

such an extensive number of variables, all which have been repeatedly tied to severe suicidal symptoms, makes these investigations a rigorous test of Joiner's theory.

Even so, the causal mechanisms of acquired capability—habituation and opponent processes—were not tested in these analyses. There are studies, however, that have directly tested these mechanisms. Orbach, Palgi, Stein, and Har-Even (1996) demonstrated that individuals hospitalized in an intensive care unit following a suicide attempt endured more electric shocks and reported less physical pain in an experimental situation than those hospitalized for accidental injuries or healthy control subjects. Additionally, Orbach, Mikulincer, King, Cohen, and Stein (1997) found that adolescent suicide attempters have higher thermal pain thresholds (they can withstand being exposed to hotter temperatures) than non-suicidal adolescent psychiatric inpatients and healthy control subjects. This study extended previous findings by utilizing a non-subjective measure of pain tolerance. The Orbach et al. (1996; 1997) studies both suggest that recent suicide attempters show signs of numbness or habituation to pain.

More recently, Nock, Joiner, Gordon, Lloyd-Richardson, and Prinstein (2006) directly investigated both of the causal mechanisms presumed to underlie acquired capability for suicide. Furthermore, they explored the role of these mechanisms in non-suicidal self-injury (NSSI) or “direct, deliberate destruction of one's own body tissue in the absence of intent to die” (Nock et al., 2006). NSSI actions provide exposure to pain and provocative experiences and are not completed with suicidal intentions or for suicidal practice, potentially making NSSI an indirect route to developing acquired capability. This is significant because Joiner (2005) asserts that repeated exposure to all types of physical pain and provocative events will increase an individual's ability, but not

necessarily their desire, to take suicidal action that would have otherwise provoked too much fear and agony. The researchers found that adolescent psychiatric inpatients with a longer history of NSSI and those who used a wider variety of injurious techniques (cutting, burning, scratching, banging, hitting, biting, and interfering with wound healing) had the highest rates of attempted suicide, supporting Joiner's assertion that habituation to pain—even if not acquired through acts with the intention to take one's life—plays an instrumental role in suicidal behaviors. This study simultaneously assessed the role of opponent processes in suicidal behavior. The participants who reported the lowest level of pain and greatest amount of comfort from NSSI had the greatest number of serious suicidal behaviors.

All of the aforementioned studies examining the casual mechanisms of acquired capability corroborated Joiner's theory, but several limitations of these studies should be noted. Orbach et al. (1997) and Nock et al. (2006) used samples that were comprised completely of adolescent psychiatric inpatients. Their results might not generalize to other age groups or people with lesser degrees of psychopathology. Furthermore, the lower pain thresholds observed for multiple suicide attempters and participants who engaged in more NSSI could reflect a high baseline level of pain insensitivity rather than habituation to pain through multiple exposures to intense discomfort. It should also be mentioned that, in contrast to the Orbach et al. (1997) and Nock et al. (2006) studies, the Orbach et al. (1996) investigation found that suicide attempters reported greater pain insensitivity, but did not show pain analgesia on objective physiological measures.

Joiner et al. (2007) recently provided a very stringent test of the predictive power of pain habituation for suicidal behavior. Researchers reported that in a sample of

participants who had been abused as children, abuse characterized by greater degrees of violence was most strongly related with suicide attempts. Participants who were physically abused and violently sexually abused exhibited more serious past and present suicidal behavior than participants who were verbally abused and molested. This pattern was observed even when controlling for psychiatric history, family suicide attempts, and family psychiatric history. These results suggest that, even in populations that do not experience self-inflicted pain and violence, the degree with which people have been exposed to pain and violence distinguishes among people with varying levels of suicidality.

Imagining Suicide

As evidenced above, researchers who have investigated the acquired capability dimension of the Interpersonal Theory of Suicide hypothesize that people can habituate to the fear of pain and death through a number of different life experiences (Joiner, 2005; Van Orden et al., 2010). Suicide attempts, childhood maltreatment, exposure to suicidality, combat experiences, and impulsivity are all empirically tested indicators of acquired capability (Van Orden et al., 2010). Nevertheless, Selby, Anestis, and Joiner (2007) propose that researchers have yet to compile an exhaustive list of the predictors of heightened acquired capability. They suggest that actual physical and visual contact with painful and provocative stimuli may not be the only route to developing the ability to engage in suicidal behavior. Instead, Selby et al. (2007) hypothesize that repeatedly imagining suicide-related images will also activate habituation processes.

Despite an abundance of evidence suggesting that visual imagery plays an important role in the phenomenology of a wide variety of psychological disorders and a

series of recent studies that suggest visual imagery significantly influences future behavior (Hackmann, Clark, & McManus, 2000; Libby, Shaeffer, Eibach, & Slemmer, 2007; Morewedge, Huh, & Vosgerau, 2010), scientists at the Oxford Mindfulness Centre recently became the first individuals to empirically investigate the role of images in suicidality. Their research (Crane, Shah, Barnhofer, & Holmes, 2012; Hales, Deepro, Goodwin, & Holmes, 2011; Holmes, Crane, Fennell, & Williams, 2007) suggests that the majority of suicidal individuals suffering with major depressive disorder and bipolar disorder frequently experience suicide-related imagery.

Holmes et al. (2007) completed the first investigation. In order to assess the occurrence, intensity, and frequency of suicide-related imagery, they developed the Suicidal Cognitions Interview—a structured clinical interview modeled after interviews used to assess mental imagery in individuals diagnosed with Agoraphobia and Social Phobia. All of the 15 participants recruited for the study were individuals with a history of recurrent depression. They were in remission at the time when the interview was administered. All 15 participants indicated that they experienced suicide-related images when at their most suicidal and depressed. Furthermore, each of the participants described the suicide-related images as intrusive, distressing, compelling, and repetitive. Holmes et al. (2007) labeled the suicide-related images as “flash-forwards” to suicide because the participants’ experiences with suicide-related imagery shared many characteristics of the flashbacks experienced by individuals with posttraumatic stress disorder. Interestingly, participants who reported the most severe history of suicidality tended to report that the images they experienced were both distressing and comforting. This pattern of results is consistent with the opponent processes component of Joiner’s

(2005) Interpersonal Theory of suicide. Repeated exposure to life-threatening mental imagery seemed to have attenuated the participants' natural fear response and intensified their potential to experience rewarding sensations.

Crane et al. (2012) sought to replicate the findings of the Holmes et al. (2007) study. Once again, Crane et al. recruited participants with a history of recurrent depression who were currently in remission. However, five of the participants recruited for the study had no history of suicidality and the remaining participants were divided among suicide ideators and individuals who had made at least one suicide attempt. The 22 participants with a history of suicidality all reported experiencing suicide-related imagery. Surprisingly, three of the five participants without a history of suicidality also reported experiencing suicide-related imagery. There were meaningful differences between the imagery experienced by the three groups of participants (non-suicidal individuals, suicide ideators, and suicide attempters). Participants with the most severe history of suicidality reported less distress and more comfort associated with suicide-related images than participants with lower levels of past suicidality, reaffirming the idea that the emotional connotation of suicide-related imagery influences the consequences of experiencing suicide-related images.

Hales et al. (2011) found that the frequency, intensity, and emotional connotation of suicide-related images also vary by mental disorder. Twenty participants with a history of major depressive disorder and 20 participants with a history of bipolar disorder were recruited for the study. As in the previous two studies, all of the participants reported experiencing compelling, recurring suicide-related images. However, Hales et al. (2011) found that—in addition to reporting a greater tendency to engage in mental

imagery in general—participants diagnosed with bipolar disorder reported experiencing suicide-related imagery more frequently and rated this imagery as more compelling than participants diagnosed with unipolar depression. Individuals diagnosed with bipolar disorder were also almost three times more likely than individuals with unipolar depression to report that their suicide-related images increased their desire to take suicidal action. Strikingly, Hales et al. (2011) found that less than a quarter of the 40 participants had discussed their suicidal images with their counselor. These results suggest that suicidal imagery warrants greater clinical attention and further empirical investigation. People diagnosed with bipolar disorder have higher rates of completed suicide than individuals suffering from all other forms of psychopathology and empirical evidence shows that individuals diagnosed with bipolar disorder spend an especially large amount of time preoccupied with vivid and compelling suicide-related images; these two facts suggest that suicidal imagery could play an important role in predicting suicide risk. Furthermore, the Hales et al. (2011) study suggests that the function and consequences of suicidal imagery might vary across psychiatric disorders.

As alluded to above, Selby et al. (2007) are among the selective group of researchers who have investigated mental imagery in suicidal individuals. They were the first to conduct an empirical investigation guided by the Interpersonal Theory of Suicide and the first to attempt to generalize the Oxford researchers' findings (Crane et al., 2012; Hales et al., 2011; Holmes et al., 2007) beyond individuals suffering with bipolar and unipolar depression. Undergraduate students who participated in the study were asked to complete three surveys: The Anger Rumination Scale (ARS; Sukhodolsky, Golub, & Cromwell, 2001), The Beck Depression Inventory (BDI-II; Beck, Steer, & Garbin, 1988),

and the Beck Scale for Suicide Ideation (BSS; Beck, Steer, & Ranieri, 1988). The ARS was used to measure participants' tendency to fantasize about violent events, the BDI-II was used to measure their current levels of depressive symptomology, and the BSS was used to assess their current level of suicidality. Selby et al. (2007) found that participants who tended to fantasize about violent events and participants who reported high levels of depressive symptomology also reported the greatest suicidality.

However, the Selby et al. (2007) study had several limitations. Researchers used the Thoughts of Revenge subscale of the ARS as a measure of suicide-related imagery. Sample items from this scale include: "I have long living fantasies of revenge after the conflict is over," "When someone makes me angry I can't stop thinking about how to get back at this person," "I have daydreams and fantasies of a violent nature," and "I have difficulties forgiving people who have hurt me." None of these items directly assessed the participants' tendency to engage in suicide-related imagery. Furthermore, the BDI-II only assesses suicidal ideation and suicidal intent; the measure does not ask for information about past suicide attempts. The Selby et al. (2007) study provides no evidence about whether engaging in violent imagery can predict suicidal behaviors. Lastly, the researchers did not include a direct measure of acquired capability. Therefore, there is no way to determine if habituation and opponent processes mediate the association between fantasizing about violent events and suicidality.

Rationale and Hypotheses

Studies have recently shown that individuals who struggle with depressive symptoms report experiencing vivid suicide-related mental images during periods of profound psychological distress (Crane et al., 2012; Holmes et al., 2007; Selby et al.,

2007). These results support an extensive body of anecdotal evidence that suggests suicidal individuals often fantasize and/or agonize over persistent imaginings of their own death by suicide (Selby et al., 2007). Imagining suicide and suicide-related events may have particularly dangerous consequences; directed mental imagery or visualization practices have been shown to activate habituation processes in a variety of circumstances (Holmes, Arntz, & Smucker, 2007), and it is logical to assume that individuals who repeatedly envision the conditions surrounding their own death by suicide are diminishing their fear of pain and death. In Joiner's (2005) Interpersonal Theory of Suicide, this particular form of habituation is known as acquired capability. Previous research suggests that acquired capability is related to prior suicidality, with greater levels of acquired capability corresponding with more severe expressions of previous suicidality. Therefore, the first hypothesis was that engagement (frequency, emotional impact, vividness, realism) with suicide-related imagery would predict history of suicidality—with individuals who reported the greatest engagement with suicide-related images reporting higher levels of prior suicidality.

The second hypothesis was that relationships between the variables of suicidal imagery, as measured by an adaptation of the Suicidal Cognitions Interview (Hales et al., 2011; Holmes et al., 2007), acquired capability—as measured by The Acquired Capability for Suicide Scale (ACSS; Van Orden, Witte, Gordon, Bender, & Joiner, 2008), and history of suicidality—as measured by the Self-Harm Behavior Questionnaire (SHBQ; Gutierrez, Osman, Barrios, & Kopper, 2001), would be explained by a mediational model (see Figure 1). Acquired capability was expected to be the primary mechanism or mediating variable through which the independent variable of engagement

with suicide-related imagery influenced the dependent variable of prior suicidality. Four conditions must be met for acquired capability to be considered a mediator: (a) the total effect of suicidal imagery on prior suicidality must be significant, (b) the path from suicidal imagery to acquired capability must be significant, (c) the path from acquired capability to history of suicidality must be significant, and (d) the inclusion of acquired capability into a regression model must reduce the significance of the relationship between suicidal imagery and past suicidality.

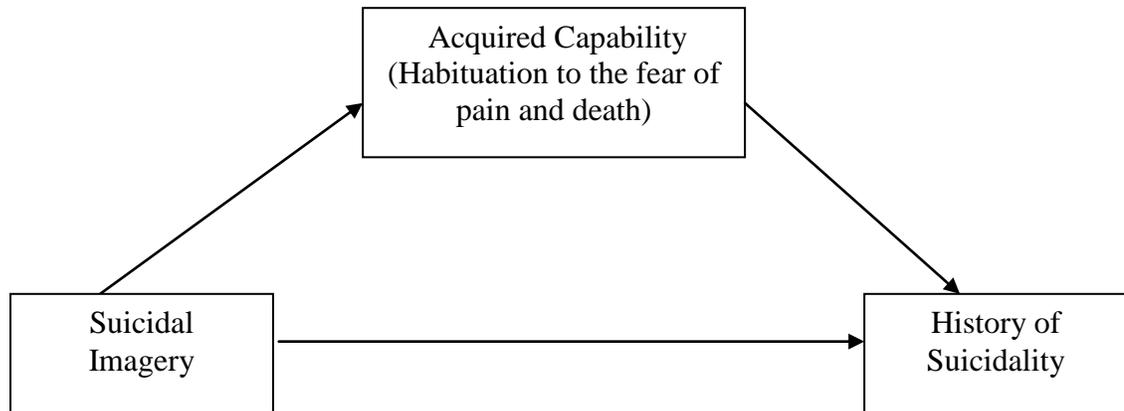


Figure 1. Conceptual model of the hypothesized relationships between suicidal imagery, acquired capability, and history of suicidality.

Method

Participants and Procedure

Two hundred and thirty-seven participants (59% female; mean age = 20, $SD = 7.42$; 70% Caucasian, 13% African American, 12% Asian, 11% Multi-ethnic, 5% Hispanic) were recruited from introductory psychology classes through Western Kentucky University's Study Board website and received credit toward the completion of class requirements. Participants met in small groups within an on-campus classroom to complete the study. After signing an informed consent document, participants were given a packet of questionnaires that included measures to assess self-harm-related factors, suicidal imagery, and acquired capability. Participants completed the questionnaires within one hour. Researchers remained in the room during the assessment sessions to answer questions and assess critical items for risk of self-harm. Researchers deemed participants at high risk for self-harm if they indicated that they had engaged in NSSI or suicidal behaviors within the past year. Masters level researchers in the clinical psychology program spoke to participants who met these criteria and provided referrals to the Counseling and Testing center on Western Kentucky University's campus. Participants who the researchers considered to be at imminent risk for self-harm (e.g., individuals who stated that they could not control their urges to engage in self injurious actions and individuals who had a plan and/or the means to attempt suicide) were directly escorted to the Counseling and Testing Center. Approval for the project was received from the Western Kentucky University Institutional Review Board as part of a larger study on mental health and risk behaviors (Appendix A).

Measures

Suicidal imagery. A modified version of the 21-item Suicidal Cognitions Interview (Hales et al., 2011; Holmes et al., 2007) was used to measure individuals' tendency to engage in suicide-related imagery. The Suicidal Cognitions Interview is a structured interview comprised of both free-response and forced-choice items. The adapted version, the Modified Suicidal Cognitions Interview (MSCI), used in the current study utilizes both types of questions, but was converted to a self-report format (see Appendix B). The original item stems were not altered and only minor adjustments were made to the original instructions. However, only the 16 items addressing mental images were included in the revised questionnaire. The nine forced choice items that quantitatively measure suicide-related imagery engagement (frequency, emotional impact, vividness, realism) were included for analysis (#'s 1, 3, 4, 5, 7, 8, 9, 10, 12). The remaining seven items did not quantitatively address imagery engagement and were kept for exploratory purposes. Three of these items asked for qualitative details about the images, three evaluated image perspective, and one measured the types of images experienced. Cronbach's alpha for the nine analyzed items was .92. The individuals were asked to rate all of these items on a 9-point scale. The total score was derived by summing all of the items. Total scores range from 9 to 81, with higher scores indicating a greater engagement with suicide-related images.

Acquired capability. The Acquired Capability for Suicide Scale (Van Orden et al., 2008) is a 20-item measure of respondents' fear about suicide and their capability of engaging in lethal self-harm (Appendix C). Sample items include, "I am not at all afraid to die," "The best parts of hockey games are the fights," and "I can tolerate a lot more

pain than most people.” Individuals are asked to rate each item on a 5-point scale with 0 indicating a response of *Not at all like me* and 4 indicating a response of *Very much like me*. The total score is derived by summing all items. Seven of the 20 items are reverse scored (e.g., “The pain involved in dying frightens me” and “The sight of a dead body is horrifying to me”). Total scores range from 0 to 80, with higher scores indicating greater levels of acquired capability. Cronbach’s alpha was .81 for the present sample.

The ACSS is correlated in the expected direction with the Fear of Suicide subscale of the Reasons for Living Inventory (Linehan, Goodstein, Nielsen, & Chiles, 1983), a widely used measure of suicide risk assessment. The scale has also been shown to exhibit adequate internal consistency (Bryan, Cukrowicz, West, & Morrow, 2010; Bryan, Morrow, Anestis, & Joiner, 2009; Van Orden et al., 2008). Furthermore, in line with theoretical prediction, the ACSS is not associated with ratings of emotional distress (Bryan et al., 2009).

History of suicidality. The Self-Harm Behavior Questionnaire (SHBQ; Gutierrez et al., 2001) is a brief self-report survey assessing the severity of respondents’ nonlethal self-injurious behaviors (Appendix D). The measure is divided into four separate sections. The first section asks about non-suicidal self-injury (“Have you ever hurt yourself on purpose?”), the second section asks about suicide attempts (“Have you ever attempted suicide?”), the third section asks about suicide threats (“Have you ever threatened to commit suicide?”), and the fourth section asks about suicidal ideation (“Have you ever talked or thought about wanting to die? Have you ever talked or thought about committing suicide?”). Follow up questions in each section address lethality, intent, lifetime incidence, and outcome. The questionnaire includes both free response

and forced-choice items. The SHBQ's coding system is designed to provide a single numerical value for each item. These values are summed to produce a total score for each of the four distinct sections (Part A: non-suicidal self-injury, Part B: suicide attempts, Part C: suicide threats, and Part D: suicide ideation). It is also possible to combine scores on the four sections to produce a total score that represents the overall frequency and severity of respondents' self-harm behaviors. A total score of 22 or higher was found to have high sensitivity (96%) and specificity (96%) in differentiating suicide attempters and ideators from other inpatient control groups (Gutierrez & Osman, 2008). In the current study, scores on the four subsections were combined and this total score was used in all planned analyses.

The SHBQ is widely used to assess young adult self-harm behaviors, and has been found to be a reliable indicator of current and past suicidality (Gutierrez et al., 2001). Analyses evaluating inter-rater reliability for the scoring of the questionnaire suggest that the percentage of agreement is between 95% and 100% (Gutierrez et al., 2001). The measure is significantly correlated with other validated and commonly used assessments of suicide-related behaviors: the Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001), the Adult Suicidal Ideation Questionnaire (ASIQ; Reynolds, 1991), and the Suicide Probability Scale (SPS; Cull & Gill, 1988).

Results

The first hypothesis was that individuals who reported the greatest engagement with suicide-related images would report higher levels of prior suicidality. A correlational analysis was conducted to determine the Pearson R correlation coefficient between the MSCI and SHBQ scores. As hypothesized, MSCI scores were positively correlated with SHBQ scores ($r = .51, p < .01$).

The second hypothesis was that scores on the ACSS would serve as a mediator of the significant relationship between MSCI and SHBQ scores. Contrary to prediction, preliminary correlational analyses showed that the relationship between MSCI and SHBQ scores was the only significant relationship between the three variables (see Table 1). The correlational data show that the conditions required for acquired capability to be considered a mediator are not met in the current sample: acquired capability scores were not correlated with suicidal imagery or self-harm behavior scores. Therefore, mediational analyses were not performed.

Table 1

Correlations Between and Descriptive Statistics for All Measures

	M (SD)	1	2	3
1. MSCI	23.39 (16.17)	-		
2. ACSS	43.89 (12.40)	.04	-	
3. SHBQ	6.36 (11.78)	.51**	.03	-

Note. Correlations significant at the 0.01 level (two-tailed) are delineated with a (**).

The Modified Suicidal Cognitions Interview (MSCI): A modified version of the 21-item Suicidal Cognitions Interview (Hales et al., 2011; Holmes et al., 2007); higher scores indicate a greater tendency to visualize vivid suicide-related images. ACSS: The Acquired Capability for Suicide Scale (Van Orden et al., 2008); higher scores indicate greater levels of acquired capability for suicide. SHBQ: The Self-Harm Behavior Questionnaire (Gutierrez et al., 2001); higher scores indicate greater overall frequency and severity of respondents' self-harm behaviors.

Because the initial hypothesized relationships were not found to be significant in the sample, exploratory analyses were performed on a subsample of the data collected. These data were comprised only of participants who reported any history of suicidal behaviors (suicide attempts, suicide threat, suicide ideation) on the SHBQ ($n = 67$). It was thought that the large number of participants with no history of suicidal behavior might have minimized relationships between variables (see Table 2). Nevertheless, correlational analyses on this subsample also failed to show the expected relationships between SHBQ and ACSS scores and MSCI and ACSS scores. There were, however, significant correlations between the Suicide Ideation and Suicide Threat subscale scores of the SHBQ and ACSS scores (see Table 3), as well as, a significant correlation between Item 1 [When you have been at your most despairing or suicidal, how much did you find

yourself thinking in images (e.g., mental pictures, sound images, images of sensations or smells)?) scores on the MSCI and ACSS scores (see Table 4). In line with theoretical predictions, greater seriousness of suicidal ideation corresponded with higher levels of acquired capability, and larger amounts of time spent engaged in mental imagery when suicidal and despairing were also associated with higher levels of acquired capability. In contrast with theoretical expectations, there was an inverse relationship between suicidal threats (i.e., communications about suicide) and acquired capability, greater severity of suicidal threat behaviors corresponded with lower levels of acquired capability.

Table 2

Number of Participants Reporting Self-Harm Behaviors

	<i>n</i>	<i>(%)</i>
No Self-Harm Behaviors	153	(65%)
Non-Suicidal Self-Injury	46	(19%)
Suicide Attempt/s	12	(5%)
Suicide Threats	18	(8%)
Suicide Ideation	63	(27%)

Note. Several participants reported engaging in multiple types of suicidal behaviors, and this explains why the number of participants in the Suicide Attempts, Suicide Threats, and Suicide Ideation categories does not sum to 67.

Table 3

Correlations between SHBQ Score, SHBQ Subscale Scores, and ACSS Score for Subsample of Participants Reporting a History of Suicidal Behavior (n = 67)

	M (SD)	1	2	3	4	5	6
1. SHBQ	19.43 (14.83)	-					
2. SHB	5.76 (6.96)	.77**	-				
3. SI	7.28 (3.28)	.49**	.34**	-			
4. ST	3.58 (6.25)	.54**	.11	.01	-		
5. SA	2.78 (6.10)	.74**	.42**	.25*	.17	-	
6. ACSS	44.84 (12.95)	-.03	.07	.25*	-.30*	.03	-

Note. Correlations significant at the 0.05 level (two-tailed) are delineated with a (*). Correlations significant at a 0.01 level (two-tailed) are delineated with a (**).

SHBQ: The Self-Harm Behavior Questionnaire (Gutierrez et al., 2001); higher scores indicate greater overall frequency and severity of respondents' self-harm behaviors. SHB: Self Harm Behavior subscale of the SHBQ; higher scores indicate greater overall frequency and severity of non-suicidal self-injury behaviors. SI: Suicide Ideation subscale of the SHBQ; higher scores indicate greater overall frequency and severity of suicidal ideation. ST: Suicide Threat subscale of the SHBQ; higher scores indicate greater overall frequency and severity of suicide threat (communications about suicide). SA: Suicide Attempt subscale of the SHBQ; higher scores indicate greater overall frequency and severity of suicide attempts behaviors. ACSS: The Acquired Capability for Suicide Scale (Van Orden et al., 2008); higher scores indicate greater levels of acquired capability for suicide.

Table 4

Correlations between MSCI Score, MSCI Item Scores, and ACSS Score for Subsample of Participants Reporting a History of Suicidal Behavior (n = 67)

	M (SD)	1	2	3	4	5	6	7	8	9	10	11
1. Img1	3.91 (3.03)	-										
2. Img3	3.81 (2.23)	.50**	-									
3. Img4	4.57 (2.65)	.32**	.56**	-								
4. Img5	4.46 (2.47)	.40**	.78**	.64**	-							
5. Img7	5.49 (2.98)	.16	.42**	.49**	.55**	-						
6. Img8	2.75 (2.40)	.23	.21	.14	.28**	.08	-					
7. Img9	5.73 (2.87)	.25*	.52**	.67**	.69**	.76**	.31*	-				
8. Img10	4.34 (2.68)	.34**	.47**	.60**	.48**	.48	.24	.66**	-			
9. Img12	5.43 (3.19)	.19	.25	.36**	.37**	.66**	.02	.54**	.47**	-		
10. MSCI	35.66 (15.34)	.57**	.77**	.78**	.84**	.71**	.42**	.86**	.75**	.53**	-	
11. ACSS	44.84 (12.95)	.26*	.40	.05	.09	-.02	-.08	-.01	-.16	-.09	.04	-

Note. Correlations significant at the 0.05 level (two-tailed) are delineated with a (*). Correlations significant at a 0.01 level (two-tailed) are delineated with a (**).

The Modified Suicidal Cognitions Interview (MSCI): A modified version of the 21-item Suicidal Cognitions Interview (Hales et al., 2011; Holmes et al., 2007); higher scores indicate greater engagement (frequency, emotional impact, vividness, realism) with suicide-related images. Img1...12: Individual imagery items on the MSCI; higher scores indicate greater levels of engagement with suicide-related images. ACSS: The Acquired Capability for Suicide Scale (Van Orden et al., 2008); higher scores indicate greater levels of acquired capability.

In addition, this subsample provided further data suggesting a significant link between suicide-related imagery and suicidality. Of the participants who reported varying degrees of past and present suicidal behaviors (suicide attempts, suicide threat,

suicide ideation) on the SHBQ, 85% reported thinking in images specifically related to suicide on the Suicidal Imagery measure. Moreover, 69% of these participants reported experiencing their suicide-related images as seeming at least moderately vivid. Higher reported levels of image vividness were related to higher scores on the SHBQ ($r = .38, p < .01, n = 67$). The 12 participants who reported suicide attempts on the SHBQ all reported experiencing their suicide-related images as seeming at least moderately vivid. In addition, 50% of participants who indicated a history of suicidality reported experiencing their suicide-related images as feeling at least half-real (as opposed to solely a mental event). Higher reported levels of image realism were related to higher scores on the SHBQ ($r = .27, p < .05, n = 67$).

The Suicidal Imagery Questionnaire also captures qualitative data. The content of the reported suicide-related images reliably fell into one or more of four image types. A list of the four categories and examples of eight participant descriptions are provided below (Table 5). The image descriptions that most clearly exemplified each of the given categories were selected for inclusion.

Table 5

Examples of Reported Suicide-Related Images Categorized by Content Type

Image Type	Participant Description
<p>Imagining details of the location, logistics, and sensory experiences of a suicide attempt</p>	<p>The image was of me hanging myself. I pictured the rope, the feeling of it around my neck, the pressure building in my head. I pictured the chair I'd climb on as well.</p> <p>The image was of myself driving my truck to school and intentionally swerving into a tree, going way over the speed limit. My friends and family would all think it was an accident, so that my family wouldn't have to deal with a 'suicide'.</p>
<p>Picturing the reaction of family members and friends to the suicide</p>	<p>The image is of my family and friends smiling and laughing—being happier if I were dead or just gone from their lives.</p> <p>The image is of my children crying, my parents crying, but seeing if hell was better than the fear of domestic violence daily.</p>
<p>Fantasizing about pleasurable outcomes of suicide</p>	<p>The image was of my sisters and close friends at my funeral crying and me turned away because I was finally with my mother in heaven.</p> <p>The image is of when my dad killed himself and how it affected all of his loved ones. I imagine the hardest parts of my life right now, like school and work, and how easy it would be to quit.</p>
<p>Seeing the aftermath of the suicide attempt</p>	<p>The image is of an urn with my ashes being poured somewhere. All my stuff sitting in storage. My death not really shocking people and people forgetting about me.</p> <p>The image I see is my mother going crazy, a lot of people not caring and talking a bunch of nonsense, and myself feeling free.</p>

Discussion

The primary aim of this study was to investigate the role of suicide-related mental imagery in self-harm behaviors. It was hypothesized that individuals who indicated the greatest engagement with suicide-related images would report the most severe expressions of suicidality. Furthermore, it was expected that heightened levels of acquired capability among those with the greatest engagement with suicide-related imagery would explain this relationship. The results showed that high levels of suicide-related imagery engagement corresponded with greater severity of prior suicidality. However, the results did not support the mediation hypothesis.

The significant relationship between suicidal imagery and suicidality reinforces prior investigations suggesting that mental imagery plays an important role in suicidal behavior (Crane et al., 2012; Hales et al., 2011; Holmes et al., 2007; Selby et al., 2007). Like earlier studies that directly addressed suicidal imagery (Crane et al., 2012; Hales et al., 2011; Holmes et al., 2007), the present investigation found that an overwhelming majority of participants who reported prior suicidality also indicated experiencing suicidal imagery. Moreover, the significant correlation between scores on the MSCI and scores on the SHBQ reinforced prior findings suggesting that scores on quantifiable items of the interview format of the Suicide Cognitions Interview correspond with scores on the Beck Scale for Suicide Ideation—Worst-Ever Version (BSSw; Beck, Brown, & Steer, 1997), a measure of severity of past suicidality. These similarities were found despite the fact that the previous studies were conducted in England, used diagnostic inclusion criteria (previous diagnosis and/or treatment for mood disorder), a structured interview

design (as opposed to the adapted questionnaire format of the current design), and included far fewer participants (the largest prior sample size was 40 participants).

Exploratory quantitative analyses run on data collected from participants reporting some level of past suicidal behavior also seemed to support previous research findings. Ratings of imagery realism were somewhat lower in the current study than in the Holmes et al. (2007) study, but this seems to be explained by the fact that participants in the Holmes' investigation were selected exclusively from a clinical population (all were patients with a history of recurrent depression). Approximately two thirds of the participants with a history of suicidality in the Holmes et al. (2007) study rated the "realness" of their suicidal imagery as at least moderately real as compared to half of the participants with a history of suicidality in the current study. This difference could easily be explained by disparities in the severity of psychopathology experienced among participants in the two studies.

The significance of these findings is highlighted by the fact that prior studies have shown that vividness of mental imagery is one of the most crucial aspects of whether an imagined event will be considered real (Gonsalves et al., 2004; Johnson, 2006). Direct or real experiences with pain and provocation have repeatedly been shown to lead to heightened levels of acquired capability, and a phenomenon such as experiencing the vivid suicide-related images reported in the study should be expected to activate similar habituating processes. This expectation is strengthened by the fact that clinical treatments such as systematic desensitization, a practice in which a patient is asked to repeatedly imagine coming into contact with a feared stimulus until that anxiety subsides, have been shown to be effective in treatment for phobias and obsessive compulsive

disorder (Wild, Hackmann, & Clark, 2007). Moreover, recent neuropsychological investigation suggests that the mental mechanisms involved in perception significantly overlap with those tied to mental imagining and that mental imagery is a particularly strong emotional amplifier (Ganis, Thompson, & Kosslyn, 2004; Holmes, Mathews, Mackintosh, & Dalgleish, 2008).

In addition, the exploratory qualitative analyses performed on the current data conform to previous findings. The qualitative content of participants' descriptions of their suicidal imagery was similar to that gathered in earlier studies. For instance, the following imagery content was documented in the Crane et al. 2012 and Holmes et al. 2007 investigations, respectively: "I see myself climbing the tree, tying rope to a branch above, putting the noose over my head and tightening it" and "I picture my dead parents, flipping from one face to another." These images correspond strikingly with examples documented in the results section of the current study. Furthermore, images in the current and previous studies appear to most frequently involve picturing the reaction of family members and friends to the suicide; imagining details of the location, logistics, and sensory experiences of a suicide attempt; seeing the aftermath of the suicide attempt such as viewing their body in a casket or an urn; and/or fantasizing about pleasurable outcomes of suicide such as seeing a deceased parent or feeling a sense of relief from current suffering. Only rarely do participants in any of the studies report imagining past events. In these infrequent cases, the imagery reported is most frequently of a traumatic event in the participant's personal history. The similarity of this qualitative data is significant considering the fact that the questionnaire used to measure suicidal imagery was adapted from a measure using a structured interview format. The likeness between

the degrees of detail supplied by participants in the current study as compared to the prior investigations is especially noteworthy.

The fact that research suggests individuals with suicidal histories experience mental images consisting of this content is important for a number of reasons. Mental rehearsal of future personal action increases the likelihood that the imagined events will be carried out (Koehler, 1991; Libby et al., 2007). Therefore, individuals who imagine details of suicidal preparation and action are likely to experience increases in suicidality. Furthermore, repeatedly imagining details of fearsome subjects can activate habituating mechanisms. Individuals who have habituated to the fear of suicide related stimuli are more likely to exhibit approach behaviors toward these stimuli in reality. When suicidal imagery centers on the aftermath of suicidal behavior, comforting images of reduced suffering following death can similarly assuage death related fears. Finally, suicide related imagery, regardless of specific content, initiates availability heuristics. A belief that suicide is a likely outcome threatens to reify “all or nothing thinking” (i.e., irrational certainty that the only choice is to suffer a seemingly intolerable level of pain or stop the pain via suicide) that is prevalent in suicidal individuals (Weishaar & Beck, 1992).

The previous investigations discussed above were focused on establishing the prevalence of suicidal imagery and the nature and content of this imagery, and were not designed to explicitly examine the role of suicidal imagery in suicidal behaviors. Nevertheless, the investigators put forth several hypotheses regarding the function of suicidal imagery based on the qualitative information gathered and existing theoretical frameworks [e.g., emotional dysregulation (Linehan, 1993), the escape hypothesis (Baumeister, 1990), and the Interpersonal-Psychological Theory of Suicidal Behavior

(Joiner, 2005)]. The current study examined suicidal imagery through the lens of the Interpersonal-Psychological Theory of Suicidal Behavior. Suicidal imagery was thought to have served as an indirect means for people to acclimate themselves to fear of death and pain. The previously discussed positive relationships between the experienced vividness and realism of suicide-related images and history of self-harm related behavior conform to the expectations of Joiner's theory. In addition, the content of the reported suicidal images appears to support this hypothesis. Participants indicated that they experienced vivid images of different methods of suicide completion (e.g., hanging) and detailed images of the aftermath of suicidal action (e.g., scenes of a comforting afterlife). Nevertheless, acquired capability measures were not correlated with suicidal imagery or suicidality.

The absence of a relationship between ACSS scores and SHBQ scores is unexpected. Previous literature has widely documented an association between acquired capability and frequency/severity of suicidal behavior. One possible explanation for these findings is that previous replications have not employed the SHBQ as a measure of self-harm behaviors. Another explanation could be that students felt overwhelmed by the number of measures administered in the single testing session and were careless when filling out the questionnaires. Another likely explanation is there was not enough variability in the undergraduate sample for prediction. Future studies should include replications of the current design using clinical populations and larger university/community samples.

The exploratory correlational analyses on a subsample of data comprised only of participants who reported any history of suicidal behaviors (suicide attempts, suicide

threat, suicide ideation) on the SHBQ are difficult to interpret until these future studies have been conducted. There is no current theoretical explanation for the fact that significant relationships between acquired capability and other measured constructs only appeared after participants solely engaging in non-suicidal self-injury were excluded from the data set. The inverse relationship between the Suicide Threat subscale and acquired capability, the non-significant relationship between the Non-Suicidal Self-Injury subscale and acquired capability, and the non-significant relationship between the Suicide Attempt subscale and acquired capability found in this subsample also run contrary to theoretical expectations and an abundance of empirical findings. Determining the significance of the fact that both the amount of time spent engaging in mental imagery when suicidal and/or despairing and the severity of suicidal ideation were the only constructs correlated in the expected direction (i.e., positively) with acquired capability is difficult in light of the many questions surrounding the aforementioned findings.

Although chance irregularities due to a small sample size could explain these results, the data were included because of the possibility that these findings reflect differences between the SHBQ and measures of suicidality used in previous acquired capability research. The SHBQ Non-Suicidal Self-Injury subscale does not measure level of pain experienced during NSSI. In the Nock et al. (2006) study, level of pain experienced was the most important predictor of suicide attempts while frequency of NSSI was unexpectedly unrelated to suicidality. In addition, there are no items assessing the functional nature of NSSI behavior on the SHBQ. Previous researchers have suggested that the function (e.g., affect regulation or interpersonal) of NSSI may be vital to its relationship with suicidal behavior (Glenn & Klonsky, 2009). It is, therefore,

reasonable to expect that function could play an important role in the relationship between NSSI and acquired capability. Regardless, further investigation is needed to determine the specific circumstances under which NSSI leads to heightened acquired capability.

An additional difference between the SHBQ and suicidality measures most frequently used in acquired capability studies is that the SHBQ Suicide Attempt subscale asks for a great deal more information to ascertain attempt severity than is typical. For instance, the question “During the past 12 months, how many times did you actually attempt suicide?” is commonly the sole item used to assess severity of suicide attempt/s and responses to this question are coded into two distinct categories, single attempters and multiple attempters (Capron et al., 2012; Joiner et al. 2007; Tang et al., 2011). The SHBQ determines attempt severity on the basis of lifetime incidence, lethality, intent, and outcome. There is a possibility that the variability of the SHBQ results in a ceiling effect on ACSS scores that is not seen when only a two-part distinction is made to classify attempt severity (single attempter vs. multiple attempter). Taken together, these exploratory findings highlight the fact that the route/s through which certain events and actions influence the development of acquired capability is/are complex and multifaceted, and suggest that additional research is needed in order to fully understand these relationships.

Regardless of whether the role of mental imagery in suicidality is best explained by the Interpersonal-Psychological Theory of Suicidal Behavior, this line of inquiry has important clinical applications. Mental health professionals can best treat suicidal clients when they have a comprehensive understanding of these individuals’ mental experiences

and emerging research suggests that a vast majority of people with self-destructive states of mind experience vivid suicide-related imagery. Several empirically supported treatment techniques would directly target this maladaptive form of mental imagery. Imagery restructuring exercises could be used to help suicidal clients mold their harmful imaginings into more healthy fantasies. For example, the participant who imagines being able to turn away from her distraught family and friends at her funeral and towards happy images of being with her deceased mother could be instructed to form a fantasy where she turns toward life. She could be encouraged to begin simulating images of happy times she can experience with her living loved ones in the future and the positive impact she can have on their lives. In addition, if clients interpret the frequency of their suicidal imagery as evidence that suicide is their best or only option, then cognitive therapy aimed at investigating the rationality and/or reality of this belief could prove helpful. Moreover, frequency and vividness of suicide-related imagery could be used as an effective means of enhancing the accuracy of suicide risk assessment and of treatment efficacy. Less frequent and less vivid imagery should indicate lower overall risk and, if observed after regular monitoring, serve as a sign that a particular form of therapy is proving successful.

In conclusion, the present study supports previous findings that mental imagery plays an important role in suicidality. However, the results do little to clarify the mechanisms that explain this relationship. Future research should attempt to provide a clearer explanation of how and why suicidal imagery impacts suicidal behavior. Furthermore, applied research into the clinical applications of this knowledge is required.

APPENDIX A: Institutional Review Board Approval Letter



A LEADING AMERICAN UNIVERSITY WITH INTERNATIONAL REACH

OFFICE OF COMPLIANCE

DATE: October 12, 2012

TO: Amy Brausch, PhD

FROM: Western Kentucky University (WKU) IRB

PROJECT TITLE: [387261-1] College Student Mental Health and Risk Behaviors

REFERENCE #: IRB 13-076

SUBMISSION TYPE: New Project

ACTION: APPROVED

APPROVAL DATE: October 12, 2012

EXPIRATION DATE: October 12, 2013

REVIEW TYPE: Expedited Review

Thank you for your submission of New Project materials for this project. The Western Kentucky University (WKU) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

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

Please note that any revision to previously approved materials must be approved

by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

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

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of October 12, 2013.

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

If you have any questions, please contact Paul Mooney at (270) 745-2129 or paul.mooney@wku.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Western Kentucky University (WKU) IRB's records.

APPENDIX B: The Modified Suicidal Cognitions Interview

Sometimes we think in the form of words and phrases (“**verbal thoughts**”), sometimes we think more in the form of “**mental images**.” I am interested in the *mental images* that run through our heads when we are the most despairing or suicidal.

Definitions

Verbal thoughts: When we think in verbal thoughts, we think using verbal language (i.e., the sort we would use when we speak). A verbal thought about this survey might be, “there are so many questions!” This thought would run through your mind as words.

Mental Images: When we think in mental images, we imagine pictures in our mind’s eye. A mental image about taking this survey might be picturing in your mind’s eye what the room looks like with you sitting in it. Although mental images often take the form of pictures, they can actually include any of the five senses. For example, you might be able to “hear” the sound of your pencil scribbling across the survey papers in your imagination. We can also have image memories that come back as smells or sensations. Images can be clear or unclear. When we talk about *mental images*, we are referring to all of these types of ‘imagining.’

The questions we are going to ask now are about your way of thinking at times when you have been at your most despairing or suicidal. Please select the answer that applies to you.

1. When you have been at your most despairing or suicidal, how much did you find yourself thinking in images (e.g., mental pictures, sound images, images of sensations or smells)?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9

(1 = not at all)

(5 = half of the time)

(9 = all the time)

2. We would like to know a bit more about what your mental images are like. Please indicate if you have had any of these types of images when you have been at your most despairing or suicidal.

At your most despairing or suicidal, did you have:	(Please circle the answer that applies to you)		
	Never	Sometimes	Often
A distressing image of a real event that happened to you (e.g., a traumatic event)	0	1	2
An image of when you tried to hurt yourself in the past	0	1	2

An image of yourself planning/preparing to harm yourself or make a suicide attempt	0	1	2
An image of the things you were escaping from	0	1	2
An image of what might happen to you if you died	0	1	2
An image of what might happen to <i>other people</i> if you died	0	1	2

3. When you have been at your most despairing or suicidal, for how much of the time did you experience images specifically related to suicide?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9

(1 = not at all) (5 = half of the time) (9 = all of the time)

4. When you have been at your most despairing or suicidal, how real did your image(s) feel?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9

(1 = not at all real) (5 = half real) (9 = as if it was reality)

5. When you have been at your most despairing or suicidal, how compelling did your image(s) feel?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9

(1 = not at all compelling) (5 = moderately compelling) (9 = completely compelling)

6. Please describe in as much detail as you can one of the images that you experienced when you have been at your most despairing or suicidal. Please choose the one image that is/was most important to you. Describe it as if you were a film director, and please tell me in as much detail as possible. Please try to include answers to the following questions:

What is the image of?

How did it make you feel?

What did it mean to you?

What did it make you want to do?

Anything else about this image?

7. At the times when you were despairing and suicidal and you experienced this image, how **distressing** was the image?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9

(1 = not at all)

(5 = moderately distressing)

(9 = extremely distressing)

8. At the times when you were despairing and suicidal and you experienced this image, how **comforting** was the image?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9

(1 = not at all) (5 = moderately comforting) (9 = extremely comforting)

9. At the times when you were despairing and suicidal and you experienced this image, how **vivid** was the image?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9

(1 = not at all) (5 = moderately vivid) (9 = extremely vivid)

10. At the times when you were despairing and suicidal and you experienced this image, how much did it seem as though it was happening “right now,” rather than being something related to the past or future?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9

(1 = not at all “now”) (5 = moderately “now”) (9 = as if it were happening “now”)

11. From what perspective did you view the image?

(-3) _____ (-2) _____ (-1) _____ (0) _____ (+1) _____ (+2) _____ (+3)

(-3 = entirely looking out
through my own eyes)

(+3 = entirely observing myself
from an external)

12. When you hold the image you described in mind now, how distressing is the image?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9

(1 = not at all) (5 = moderately distressing) (9 = extremely distressing)

13. Have you experienced any positive future-oriented images at time of crisis? If so, please give a brief description.

14. In general, from what perspective did you view this future-oriented image?

(-3)____(-2)____(-1)____(0)____(+1)____(+2)____(+3)

(-3 = entirely looking out
through my own eyes)

(+3 = entirely observing myself
from an external)

15. How could you make this image more helpful?

16. In general, from what perspective do you view images in your mind's eye?

(-3)____(-2)____(-1)____(0)____(+1)____(+2)____(+3)

(-3 = entirely looking out
through my own eyes)

(+3 = entirely observing myself
from an external)

_____ 18. I prefer to shut my eyes during the violent parts of movies.

_____ 19. I am not at all afraid to die.

_____ 20. I could kill myself if I wanted to. (Even if you have never wanted to kill yourself, please answer this question.)

APPENDIX D: The Self-Harm Behavior Questionnaire

Current age: _____ SHBQ

A lot of people do things which are dangerous and might get them hurt. There are many reasons why people take these risks. Often people take risks without thinking about the fact that they might get hurt. Sometimes, however, people hurt themselves on purpose. We are interested in learning more about the ways in which you may have intentionally or unintentionally hurt yourself. We are also interested in trying to understand why people your age may do some of these dangerous things. It is important for you to understand that if you tell us about things you've done which may have been unsafe or make it possible that you may not be able to keep yourself safe, we will encourage you to discuss this with a counselor or other confidant in order to keep you safe in the future. Please circle YES or NO in response to each question and answer the follow-up questions. For questions where you are asked who you told something to do not give specific names. We only want to know if it was someone like a parent, teacher, doctor, etc.

Things you may have actually done to yourself on purpose.

1. Have you ever hurt yourself on purpose? (e.g., scratched yourself with finger nails or sharp object) **YES** **NO**
If no, go on to question #2.
If yes, what did you do?

- a. Approximately how many times did you do this? _____
- b. Approximately when did you first do this to yourself? (*write your age*) _____
- c. When was the last time you did this to yourself? (*write your age*) _____
- d. Have you ever told any one that you had done these things? **YES** **NO**
If yes, who did you tell? _____
- e. Have you ever needed to see a doctor after doing these things? **YES** **NO**

Times you hurt yourself badly on purpose or tried to kill yourself.

2. Have you ever attempted suicide? **YES** **NO**
If no, go on to question #4.
If yes, how?

- (**Note:** If you took pills, what kind? _____ how many? _____ over how long a period of time did you take them? _____)
- a. How many times have you attempted suicide? _____
 - b. When was the most recent attempt? (*write your age*) _____
 - c. Did you tell anyone about the attempt? **YES** **NO**

- Who? _____
- d. Did you require medical attention after the attempt? **YES** **NO**
 If yes, were you hospitalized over night or longer? **YES** **NO**
 How long were you hospitalized? _____
- e. Did you talk to a counselor or some other person like that after your attempt?
YES **NO** Who? _____

3. If you attempted suicide, please answer the following:

- a. what other things were going on in your life around the time that you tried to kill yourself? _____

- b. Did you actually want to die? **YES** **NO**
- c. Were you hoping for a specific reaction to your attempt? **YES** **NO**
 If yes, what was the reaction you were looking for? _____

- d. Did you get the reaction you wanted? **YES** **NO**
- e. Who knew about your attempt? _____

Times you threatened to hurt yourself badly or try to kill yourself.

4. Have you ever threatened to commit suicide? **YES** **NO**
 If no, go on to question # 5.
 If yes, what did you threaten to do? _____

- a. Approximately how many times did you do this? _____
- b. Approximately when did you first do this? (*write your age*) _____
- c. When was the last time you did this? (*write your age*) _____
- d. Who did you make the threats to? (e.g., mom, dad) _____
- e. What other things were going on in your life during the time that you were threatening to kill yourself? _____

- f. Did you actually want to die? **YES** **NO**
- g. Were you hoping for a specific reaction to your threat? **YES** **NO**
 If yes, what was the reaction you were looking for? _____

- h. Did you get the reaction you wanted? **YES** **NO**
 If you didn't, what type of reaction was there to your threat? _____

5. Have you ever talked or thought about:

Wanting to die? **YES** **NO**
Committing suicide? **YES** **NO**

a. What did you talk about doing? _____

b. With whom did you discuss this? _____

c. What made you feel like doing that? _____

d. Did you have a specific plan for how you would try to kill yourself? **YES** **NO**
If yes, what plan did you have? _____

e. In looking back, how do you imagine people would react to your attempt?

f. Did you think about how people would react if you did succeed in killing yourself?
YES **NO** If yes, how did you think they would react? _____

g. Did you ever take steps to prepare for this plan? **YES** **NO**
If yes, what did you do to prepare? _____

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