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Predictors of Suicide Risk: Capability, Reasons, and Identification

by

Prachi Kene

Submitted to the Graduate Faculty as partial fulfillment of the
requirements for the Doctor of Philosophy Degree in Psychology

Dr. Joseph D. Hovey, Committee Chair

Dr. Gregory J. Meyer, Committee Member

Dr. Joni L. Mihura, Committee Member

Dr. Denis Lynch, Committee Member

Dr. Alice Skeens, Committee Member

Dr. Patricia Komuniecki, Dean
College of Graduate Studies

The University of Toledo

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A completed suicide is one of the most dreaded outcomes in the field of mental health. Although a variety of empirical suicide risk and protective factors have been identified, there is paucity of data regarding the role of theory-driven constructs. The present study examined the role of theoretical constructs – acquired capability for suicide, reasons for attempting suicide (internal perturbation based reasons vs. extrapunitive/manipulative reasons), implicit identification with self-injury, and implicit attitude towards self-injury. Suicide ideation, clinician-judgment of suicide risk, observation level, and lethality served as criterion variables. Participants were 100 forensic and civil inpatients at three psychiatric hospitals. A history of attempted suicide was very common in this sample. All patients completed the self-report measures and Self-Injury Implicit Association Test. A chart review was conducted for all patients to complete the Suicide Assessment Checklist and Lethality of Suicide Attempt Rating Scale and to identify patient's observation level during the four weeks prior to the survey

date. As predicted, acquired capability for suicide was significantly associated with clinician judgment of suicide risk, observation level, and lethality. In contrast to the expected trend, acquired capability was significantly associated with suicide ideation. Internal perturbation based reasons were significantly associated with suicide ideation, clinician judgment of suicide risk, and patient's observation level. As predicted, extrapunitive/manipulative reasons were not significantly associated with suicide risk. Depression and hopelessness were unrelated to lethality. Regression analyses indicated that the acquired capability was a particularly useful predictor of suicide ideation, clinician judgment of suicide risk, and lethality, independently of depression and hopelessness. Internal perturbation based reasons did not independently predict suicide risk after depression and hopelessness had been taken into account in the analysis. Axis I diagnosis and hopelessness were the only significant predictors of observation level. Attempters and non-attempters did not significantly differ with respect to implicit identification with self-injury and implicit attitude towards self-injury. Implications are presented for assessment of suicide risk, treatment of suicidality, and future research.

I dedicate this dissertation to my husband, mom, dad, sister, brother-in-law, nephew, and dog.

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Chapter 1

Introduction

A completed suicide is a significant problem in inpatient psychiatric settings and is the second most common sentinel event reported to the Joint Commission (formerly Joint Commission on Accreditation of Healthcare Organizations). Of 6782 sentinel events reported to the Joint Commission from January 1995 through March, 2010, 804 (11.9%) were inpatient suicides (Joint Commission, 2010). Numerous studies have identified that the prevalence of suicide, attempted suicide, and self-injurious behavior is disproportionately higher among forensic populations and populations with serious and persistent mental illness (SPMI) than among the general population (Kullgren, Tengstrom, & Grann, 1998; Liebling, 1993; Perez-Carceles, Inigo, Luna, & Osuna, 2001). About 5% of all suicides occur in psychiatric hospitals (Stebalaj, Tavcar, & Dernovsek, 1999). Approximately 30% of all offenders have engaged in some form of self-harm behavior during the course of their incarceration (Brooker, Repper, Beverley, Ferriter, & Brewer, 2002).

The objective of the present study was to explore the role of three theoretical constructs as predictors - acquired capability for suicide, reasons for attempting suicide, and implicit identification with self-injury/implicit attitude towards self-injury.

Specifically, the present study aimed to determine the relationship between these theoretical constructs and the resulting suicidal risk. Second, we aimed to determine which criterion measures of suicidal risk (suicide ideation, clinician judgment of suicide risk, observation level, and lethality) have the strongest relationship with these predictors and the traditional risk factors of depression and hopelessness. Third, this study aimed to determine differences in implicit identification with self-injury and implicit attitude towards self-injury between attempters and non-attempters. The present article begins with a review of suicide risk factors. The next section reviews the constructs of acquired capability for suicide, reasons for attempting suicide, and implicit identification and attitude. The primary argument of this paper is that our understanding of suicidality and its effects would be developed by a more detailed exploration of the suicidal individual's capability, reasons, and implicit attitudes.

1.1 Suicide Risk Factors

Suicide risk has been conceptualized primarily in terms of the interaction of risk and protective factors. Combinations of various risk and protective factors have been suggested as precipitating suicidal risk. For the purposes of the present review, these risk factors will be subsumed under five broad categories – demographic factors, specific risk factors, Axis I conditions, personality disorders, and comorbidity.

1.1.1 Demographic Factors

Research studies have identified that several demographic variables co-occur with elevated suicide risk. These factors include age (15 -24 and 65+), gender (being a male),

marital status (separation or divorce), ethnicity (specifically, White), educational level, low socioeconomic status, and unemployment (Corten, Ribordouille, Hermann, Rorsman, & Sims, 1988; Gausset, Casadebaig, Guillaud-Bataille, Quemada, & Terra, 1992; Kochanek, Murphy, Anderson, & Scott, 2004; Martin, Cloninger, Guze, & Clayton, 1985; Newman & Bland, 1987; Perez-Carceles, et al., 2001; Tsuang & Simpson, 1985).

1.1.2 Specific Risk Factors

Research on suicidal behavior has demonstrated that suicide risk co-occurs with numerous factors like impulsivity (Apter, Plutchik, & Van Praag, 1993; Kingsbury, Hawton, Steinhardt, & James, 1999; Maser, et al., 2002), childhood adversity (Joiner et al., 2006; King et al., 2001), and hopelessness (Brown, Beck, Steer, & Grisham, 2000; Williams & Pollock, 2001; Van Heeringen et al., 2003). Suicidal risk has been found to be associated with significantly higher scores on neuroticism (Boyle & Brandon, 1998; Roy, 2003) - neuroticism is generally higher in adult attempters, and especially in those with serious intent, concurrent substance misuse, and affective disorders (Beautrais, Joyce & Mulder, 1996). Suicide attempters have been demonstrated to show higher introversion (Brezo et al., 2006; Roy, 2003) and higher psychoticism as compared to non-attempters (Roy, 2003). Suicide risk co-occurs with high harm avoidance, self-transcendence (Van Heeringen, 2003), and low agreeableness (conduct problems) (Brezo et al., 2006). Additionally, suicide attempters typically demonstrate low self-esteem, permissive attitude toward committing suicide, and higher state and trait anxiety (De Wilde, Keinhorst, Diekstra & Wolters, 1993). With regards to cognitive processes, suicidal individuals typically demonstrate deficient problem solving strategies (Pollock &

Williams, 1998). Suicide risk has also been associated with high reward dependence – “a personality dimension supposed to reflect biases in the sensitivity to social communication” (Van Heeringen, Audenaert, Van De Wiele, & Verstraete, 2000), hostile disagreeableness (Clayton, Ernst, & Angst, 1994), low cooperativeness and low self-directedness which may be either subsyndromal forms or predictors of susceptibility to psychosis and mood disorders (Cloninger, Bayon & Svrakic, 1998).

Brezo et al (2006) in their review found that several individual traits distinguish quite consistently between attempters and non-attempters. Traits related to extroversion, for example, were lower in attempters. Positive and negative emotionality, emotional instability, and anxiety measures were also associated with the risk of attempts. Novelty seeking was also important in predicting future risk of attempts in young adults. Impulsive, indirect, verbal, general, and lifetime aggression were shown to be significantly associated with attempts in psychiatric patients.

1.1.3 Axis I Conditions

A large number of studies suggest that the presence of a major psychiatric disorder is the strongest risk factor for suicide. In fact, completed suicide in the absence of psychiatric disorders is rare (Cavanagh, Carson, Sharpe, & Lawrie, 2003; Clark & Fawcett, 1992). For instance, suicide risk is substantially higher in the presence of an affective disorder, including major depression and bipolar disorder than any other mental illness (Combs & Romm, 2007). Persson, Runeson, and Wasserman (1999) found that mood disorders were the most common diagnosis in their sample of suicide attempters. Affective disorders that co-occur with psychic anxiety, panic attacks, loss of pleasure and interest, diminished

concentration, and global insomnia are associated with suicide risk (Fawcett et al., 1987). Within the group of patients with a bipolar disorder diagnosis, those with an early onset, interpersonal problems with partner, and occupational maladjustment represented a high suicide risk group independent of demographic characteristics (Tsai, Lee, & Chen, 1999). A history of alcohol abuse and deterioration in function predicts suicide in bipolar disorder (Dutta et al., 2007).

Alcoholism (Berglund, 1984; Klatsky & Armstrong, 1993; Sher & Zalsman, 2005) and substance abuse (Rowan, 2010) are important risk factors for suicide. Based on a review of studies on alcoholism and suicidal behavior, Sher (2006) found that alcoholism is a strong risk factor for suicide and its strength is increased when it occurs along with major depressive episodes, stressful life events, interpersonal difficulties, poor social support, living alone, high aggression/impulsivity, negative affect, hopelessness, comorbid substance abuse (especially cocaine abuse), serious medical illness, suicidal communication, and prior suicidal behavior.

The risk for suicide is heightened with the diagnosis of schizophrenia (Harris & Barraclough, 1997).

Anxiety disorders too have been associated with suicidal risk (Khan, Leventhal, Khan, & Brown, 2002) with the suicide risk increasing with the number of anxiety disorders present (Boden, Fergusson, & Horwood, 2007). Within this diagnostic category, posttraumatic stress disorder, in particular, has been demonstrated to elevate suicide risk (Tarrier & Gregg, 2004).

1.1.4 Personality Disorders

Many studies have looked at the role of co-occurring personality disorders. The Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition - Text Revision (DSM-IV-TR; American Psychiatric Association, 2000) personality disorders represent personality trait constellations in extreme and rigid form. Suicide risk is strongly associated with and determined by personality disorders because personality disorders, by definition, involve chronic interpersonal difficulties and poor coping strategies (Schneider et al., 2006). Thus, the reactivity and hypersensitivity that is often manifested by individuals with personality disorders is believed to account for elevated suicidal risk.

An overwhelmingly large number of statistical studies suggest links between suicide and personality disorders. To illustrate, Marttunen, Aro, Henriksson, and Lonnqvist (1994) reviewed all adolescent suicides during a year in Finland and found that antisocial behavior was present among 45% of the male completers. Using psychological autopsies, Portzky, Audenaert, and Van Heeringen (2005) found that almost half of the adolescents who committed suicide were diagnosed with personality disorders. Duberstein and Conwell (1997) found that approximately 30 to 40% of all suicides were completed by patients diagnosed with personality disorder. In other investigations, 55% to 70% of individuals who attempt suicide have been found to meet diagnostic criteria for a personality disorder (Casey, 1989; Clarkin, Friedman, Hurt, Corn, & Aranoff, 1984).

Suicide risk among people with personality disorder is seven times the expected value, and among people treated for attempted suicide 38 times the expected value (Harris & Barraclough, 1997). Suicide attempters with personality disorders have the highest level of repetition (Casey, 1992). Harwood, Hawton, Hope and Jacoby (2001)

found that 16% of elderly who had attempted suicide had a personality disorder and an additional 28% had accentuated obsessive, anxious, and dependent personality traits.

Engstrom et al. (1996) using cluster analysis identified that individuals with high psychoticism and low socialization (this closely resembles Cluster A characteristics of the DSM-IV-TR) were most likely to be considered as ‘repeaters’ or ‘completers.’

Similarly, Maser et al. (2002) found that suicide completed within 12 months of data collection was predicted by clinical variables unlike suicide completed beyond 12 months that was predicted by personality variables. Furthermore, in their study, impulsivity and assertiveness were the best prospective predictors of completed suicides beyond 12 months. Schneider et al. (2006) found that the presence of a personality disorder alone, that is, independent of an Axis I diagnosis, increases the suicide risk seven times for men and six times for women. Furthermore, they found that the presence of two or more personality disorders belonging to the different clusters elevated suicidal risk 16-fold in men and 20-fold in women. Cluster B disorders in women and cluster C in men independently contributed to suicidal risk thereby suggesting the possible interaction of personality influences and gender.

A considerable amount of research has indicated that the cluster B¹ personality disorders are commonly associated with a history of suicidal and self-destructive behaviors. Within this cluster, antisocial personality disorder (Kullgren et al., 1998; Stalenheim, 2001; Verona, Hicks, & Patrick, 2005; Verona, Patrick, & Joiner, 2001) and borderline personality disorder (Corbitt, Malone, Haas, & Mann, 1996; Reich, 1998) have been related to an increased risk of suicidal behavior and completed suicide because

¹ People with Cluster B disorders act in a dramatic, emotional, and erratic fashion. Typically, they exhibit impulsivity, violation of social norms, and acting out behaviors. They can be self-abusive and hostile to others. This cluster includes Antisocial, Borderline, Histrionic, and Narcissistic Personality Disorders.

suicide risk in borderline personality disorder is attributed to impulsive aggression and affective instability; and in antisocial personality disorder to negative emotionality and low constraint (Verona, et al., 2001). However, at the same time, several studies have identified that cluster B is not the only cluster that appears to be exclusively at risk for suicide. To illustrate, Schenider et al. (2006) in their review of studies found that suicide risk was associated with all the three clusters of personality disorders. Thus, suicide risk is not confined to just the “dramatic” Cluster B but also accompanies the personality traits associated with the “odd” Cluster A² and “anxious” Cluster C³. Suicide risk has been associated with schizotypal personality (Cloninger et al., 1998), dependent personality disorder (only when there is a comorbid lifetime depressive disorder) (Chioqueta & Stiles, 2000; Portzky et al., 2005), and a combination of borderline and avoidant traits (Raczek, True, & Friend; 1989).

1.1.5 Comorbidity

As is evident from the previous discussion, comorbid diagnoses have been associated with elevated suicide risk. Suicidal risk is particularly amplified when the clinical presentation includes comorbid anxiety disorders and depression (Pawlak, Pascual-Sanchez, Rae, Fischer, & Ladame, 1999), comorbid anxiety disorders and bipolar disorder (Simon, et al., 2007), and severe mental illness and substance abuse (Buckley, 2007). Wunderlich, Bronisch, and Wittchen (1998) stated that the risk resulting from

² People with Cluster A disorders are often viewed as odd or eccentric. They have abnormal cognitions or ideas, they speak and act in strange ways, and they have difficulty relating to others. This cluster includes the Paranoid, Schizoid, and Schizotypal Personality Disorders.

³ People with Cluster C disorders are often viewed as anxious and fearful. People with these disorders are excessively afraid of social relations and of feeling out of control. This cluster encompasses Avoidant, Dependent, and Obsessive-Compulsive Personality Disorders.

comorbidity is the highest when an anxiety disorder is one of the comorbid diagnoses. Hawton, Houston, Haw, Townsend, and Harris (2003) found that comorbidity increased suicidal risk because it was associated with other suicide risk factors. In their sample, patients with comorbid psychiatric and personality disorders had a history of previous attempts and repeated attempts unlike patients without diagnostic comorbidity. Also, suicide attempters with comorbid diagnosis were found to have more depression, hopelessness, aggression, and impulsivity along with lower self-esteem and poorer problem-solving skills than patients without diagnostic comorbidity.

1.1.6 Problems with Risk Factors

The foregoing discussion on suicide risk factors has centered on empirically and clinically identified suicide risk factors. While several risk factors have been identified, the clinical assessment of suicidal risk continues to be a challenge because most individuals that present with these empirically identified risk factors do not complete or even attempt suicide (Van Orden, Witte, Gordon, Bender, & Joiner, 2008). Suicide is a low base rate behavior. Although one third of the general population reports suicidal ideation (Paykel, Myers, Lindenthal, & Tanner, 1974), only 0.01% of Americans commit suicide each year (American Association of Suicidology, 2006). Thus, the presence of these risk factors does not assist the clinician in making predictions of suicide completions (Goldstein, Black, Nasrallah, & Winokur, 1991; Pokorny, 1983). Examining suicide risk in groups at high risk (e.g., individuals with SPMI) is one way to address the problem of low-base rate occurrence. Second, there is a growing emphasis on the role of theory-driven risk factors (Van Orden et al., 2008). The principal hypothesis has been

that what leads to elevated suicidal risk is not necessarily the presence of transient risk factors per se but, rather, the presence of more stable risk factors and their impact on the transient risk factors like depression and hopelessness.

1.2 Constructs in the Current Study

As previously mentioned, the present study investigated the role of acquired capability to enact lethal self-injury, reasons for attempting suicide, and implicit identification with self-injury/implicit attitude towards self-injury as predictors of suicide risk.

1.2.1 Capability to Harm Oneself

In recent years acquired capability for suicide has become an increasingly important focus to the study of suicidality. Joiner's (2005) interpersonal-psychological theory of suicidal behavior suggests that completed suicides entail the presence of three specific variables – a sense of thwarted belongingness, a sense of being a burden on others, and the acquired capability for suicide. As defined by Joiner, acquired capability for suicide involves habituation to physical pain and the fear of death through repeated exposure to painful and provocative events. "When self-injury and other dangerous experiences become unthreatening and mundane – when people work up to the act of death by suicide by getting used to its threat and danger – that is when we might lose them" (p. 48).

According to Joiner, painful and provocative experiences diminish the fear of self-injury and cause desensitization to pain. This diminution in fear in turn weakens the basic instinct of self-preservation and enables the individual to engage in lethal self-injury. Habituation to fear and pain associated with self-injury is believed to occur

through repeated self-injury or repeated exposure to painful and provocative experiences. In addition to habituation, opponent process (Solomon, 1980) can make self-injurious or suicidal behavior reinforcing. In this context, Joiner states,

Not only do people habituate to self-injury, they also come to experience it as increasingly rewarding...it is relief because it distracts them from even deeper emotional pain, or because it makes them feel alive, or because it brings their inner world back into harmony with the world at large (p. 84-85).

Van Orden et al. (2008) found that acquired capability for suicide was significantly predicted by painful and provocative experiences.

Any activity that allows adaptation to pain and provocation can diminish the fear and pain associated with self-injury. In addition to past suicidal behaviors, habituation to self-injury is believed to occur through a variety of painful and provocative experiences like assault; injury from recklessness or substance abuse; impulsivity; childhood physical and sexual abuse⁴; witnessing or engaging in violence; tattooing and piercing; multiple surgeries; serious drug abuse; prostitution; and psychiatric conditions like anorexia nervosa and borderline personality disorder that are characterized by pain and provocation (Brent, Johnson, Perper, & Connolly, 1994; Conner et al., 2001; Conner, Duberstein, Conwell, & Caine, 2003; Darke & Ross, 2002; DuRand, Burtka, Haycox, & Smith, 1995; Glowinski et al., 2001; Gunderson, 1984; Keel et al., 2003; Kidd & Kral, 2002; Maser et al., 2002; Mullen, Martin, Anderson, Romans, & Herbison, 1993; Nordstroem, Asberg, Aberg-Wistedt, & Nordin, 1995; Whitlock & Broadhurst, 1969; Yates, MacKenzie, Pennbride, & Swofford, 1991).

⁴ Joiner et al. (2007) found an association between childhood sexual abuse/physical abuse and later suicidality even after statistically controlling for variables like mental disorder, parents' mental disorders, divorce, and poverty.

1.2.1.1 Multiple Attempters

Research among multiple attempters has been important in unraveling the effects of acquired capability. The theoretical formulations underlying the concept of acquired capability have been supported by several studies that show progressively increasing suicide lethality and intent in individuals with a history of suicidal behaviors (O'Connor, Sheehy, & O'Connor, 2000; Pierce, 1981; Soloff, Lis, Kelly, & Cornelius, 1994; Soloff, Lynch, Kelly, Malone, & Mann, 2000). Multiple attempters, compared with suicidal ideators or single attempters, have been found to have stronger desire and resolve to die, and greater intensity and duration of suicidal ideation (Forman, Berk, Henriques, Brown, & Beck, 2004; Gispert, Davis, Marsh, & Wheeler, 1987; Lewinsohn, Rohde, & Seeley; Rudd, Joiner, & Rajab, 1996; Stein, Apter, Ratzoni, Har-Even, & Avidan, 1998). Past suicidal behavior has been shown to elevate risk for later suicidality even when empirically identified risk factors such as age, gender, marital status, ethnicity, family history of suicide, bipolar disorder, alcohol abuse, personal history of legal trouble, current and past diagnoses of depression, hopelessness, problem-solving difficulties, borderline personality symptoms, negative life events are statistically controlled (Cavanagh, Owens, & Johnstone, 1999; Joiner et al., 2005). Van Orden et al. (2008) found that the level of acquired capability for suicide was significantly associated with number of past suicide attempts. Thus, past suicidal behavior is not simply an additional contributory risk factor but has a specific and pervasive influence.

1.2.1.2 Pain Tolerance

A number of studies on pain sensitivity and suicidality have indicated that suicidal individuals have higher pain tolerance, less intense appraisals of pain, and lower physiological reactivity to pain than controls (Levine, Abramovich, Stein, & Newman, 1995; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006; Orbach, Mikulincer, King, Cohen, & Stein, 1997; Orbach, Palgi, Stein, and Har-Even, 1996a; Orbach et al., 1996b; Orbach et al., 2006; Rosenthal & Rosenthal, 1984; Russ, Campbell, Kakuma, Harrison, & Zanine, 1999).

1.2.2 Reasons for Attempting Suicide

Reasons have been demonstrated to link beliefs, motives, intentions, and behaviors (Westaby, 2005). Thus, individual's reasons for attempting suicide may reflect their feelings toward life and death which may influence their attitudes and behaviors. This may cause people who attempt suicide for different reasons to perceive, approach, and behave differently during a stressor.

It has long been recognized that patient's reasons for attempting suicide play an important role in subsequent levels of suicide risk; however, research investigations and theories have focused primarily on loss of meaning in life. Given the impact of reasons on behaviors, it is reasonable to assume that the meaning of death and purposes it would serve are important components of suicide risk. Identifying an association between reasons for attempting suicide and consequent suicidal risk is important to consider the hypothesis that treating reasons in therapy will improve suicide risk. If certain reasons are

associated with elevated suicide risk, this would inform interventions that aim to decrease suicide risk.

Although superficially many suicidal behaviors appear similar, reasons for attempting suicide are very complex. Previous research with suicidal patients has implicated depression, attempts to regulate mood, attempts to manipulate environment, and presence of psychotic symptoms as important precipitants of suicidality (Jeglic, Vanderhoff, & Donovan, 2005).

Reasons for attempting suicide have been classified into two separate categories – interpersonal reasons and reasons emerging from unbearable psychic pain.

1.2.2.1 Interpersonal Reasons

Schwartz, Flinn, and Slawson (1974) studied a group of chronically suicidal patients and found that one of the most common motives for suicidality was to secure nurturance. In this context, Schwartz (1979) stated, “There are some suicidal people for whom suicidality has become a means of securing nurturance from the interpersonal world. The usual ‘crisis response’ to suicidality reinforces such patients in their suicidal styles. Increased long-term risk becomes the price of short-term nurturance” (p. 194).

Malsberger (1994a, 1994b) too identified that one of the methods patients use in their attempts to secure nurturance is a suicidal attempt. The aggressive aspect of suicidality forces other people to respond in specific ways. A suicidal attempt is likely to trigger a crisis response in people who are seen as not likely to respond without the extreme pressure of suicidal threats and actions. Paris (2002) calls this the communication function of suicidality.

1.2.2.2 Reasons Emerging from Unbearable Psychic Pain

Emotional turmoil has been recognized as a prominent reason that triggers suicidal attempts. Unendurable psychological pain, severe intrapsychic pain, emptiness, hopelessness, and high levels of distress are reasons frequently cited for suicidal behaviors (Paris, 2007; Shnediman, 1985). Suicidal behaviors have been conceptualized as ways to cope with intense and shifting emotions, or to experience a sense of control. Thus, complete elimination of suicidal behaviors may not be a reasonable treatment goal until the patient has developed emotional regulation and distress tolerance skills. In this context, Paris (2007) states, “Such high level of distress can be tolerated only if the person knows he or she can escape it. The only way for them to go on living is to maintain the option of dying. They threaten to die in order to stay alive” (p. xv).

1.2.2.3 Empirical Investigation of Reasons

Empirical investigation of suicidal motivations during a crisis has been recognized as an important endeavor. These research studies are based on the assumption that reasons for attempting suicide provide clinicians with pertinent, significant, and independent information in explaining various suicide risk variables (Holden & McLeod, 2000).

Birtchnell and Alarcon (1971) were the first to examine reasons and found that non-death motives were important antecedents of deliberate self-harm among a majority of participants in their study. Feeling lonely or unwanted was the most frequently reported motive (53% of the sample). Intent to die was a strong correlate of the number of reported motives, thereby indicating ambivalence. Varadaraj, Mendonca, and Rauchenberg (1986) examined reasons using a list of motives for attempting suicide

(Bancroft, Skirmshire, & Simkin, 1976) and classified these reasons into three broad categories: Intrapunitive (e.g., to punish myself), Extrapunitive/Manipulative (e.g., to make people sorry for the way they treated me), and Escape/Relief (e.g., to get relief from a terrible state of mind). Most research studies have identified that intrapersonal/internal motives – to terminate unbearable emotional pain or to escape or take action in an unbearable situation – are prominent reasons for engaging in suicidal behaviors (Bancroft, Skrimshire, & Simkin, 1976; Bancroft et al., 1979; Boergers, Spirito, & Donaldson, 1998; Chopin, Kerkhof, & Arensman, 2004; Rodham, Hawton, & Evans, 2004; Sullivan, Arensman, Keeley, Corcoran, & Perry, 2004).

A review of literature revealed that internal perturbations based reasons are commonly present in suicide attempters. Holden, Kerr, Mendonca, and Velamoor (1998) investigated, “Why is it that for two equally hopeless persons, one will attempt or complete suicide whereas another will not?” (p. 569). These investigators studied adult psychiatric patients in crisis and found that internal perturbations based reasons significantly predicted intent to die, clinician’s judgment of suicide risk, and clinician’s judgment of patient’s suicidal desire and preparation for suicide, even after controlling for hopelessness. Internal perturbation based reasons, independent of hopelessness, predicted explanations of suicide attempts, ideation, and self-reported probability of future suicide completions (Johns & Holden, 1997). Research has indicated that internal perturbations based reasons are more strongly associated with suicidal actions than are depression and hopelessness, whereas depression and hopelessness are more strongly linked to suicide ideation (Johns & Holden, 1996). These authors concluded that internal

perturbations based reasons are more important than hopelessness for predicting more lethal suicide manifestations.

More recently, McAuliffe, Arensman, Keeley, Corcoran, and Fitzgerald (2007) compared patients with high and low suicidal intent. High suicide intent was associated with internal perturbations based reasons whereas low suicide intent was associated with extrapunitive reasons. Furthermore, multiple attempters were significantly more likely to report internal perturbations based reasons and significantly more number of motives than first time attempters. The explanation appears to be related to the process of sensitization wherein initial self-harm may be precipitated by stressful life events, but with repetition, self-harm progressively amplifies following aversive cognitive and emotional states (Joiner & Rudd, 2000).

In summary, internal perturbation based reasons are thought to worsen suicide risk and show promise as a particularly useful risk factor that may be helpful in determining suicidal risk.

1.2.3 Implicit Identification and Implicit Attitude

1.2.3.1 Problems with Reliance on Self-Report

Self-report data are frequently used in assessing suicide risk; however, the ability of suicidal patients to feel, experience, and report their suicidal ideation has been challenged by several studies. The discrepancies between self-reports of suicide risk and actual suicidal behaviors have emerged across several studies. Deisenhammer, DeCol, Honeder, Hinterhuber, and Fleischhacker (2000) examined inpatient suicides and found that 40.9% patients had not expressed any suicidal thoughts. Fawcett et al. (1987) found that suicidal

ideation was more prevalent in individuals that did not complete suicide than those who did. Studies on completed suicides in inpatient psychiatric settings have found that between 22.7% and 51% of patients had an improvement in psychiatric symptoms prior to the completion (Deisenhammer, et al. 2000; Dong, Ho, & Kan, 2005; Goh, Salmons, & Whittington, 1989; Morgan & Priest, 1991). Risk of completions is significantly elevated immediately following discharge, presumably shortly after patients denied suicidal intent (Goldacre, Seagroatt, & Hawton, 1993; Qin & Nordentoft, 2005).

American Association of Suicidology (AAS, 2005) emphasizes that patient's self-report of suicidal ideation is not always accurate. Busch, Fawcett, and Jacobs (2003) examined 76 suicides that occurred during inpatient hospitalization or immediately following discharge and found that 78% of the completers had denied suicidal ideation when last assessed. "No-suicide" contracts were found to be an intervention used in *every* completed suicide that occurred in an inpatient facility (Minnesota Office of the Ombudsman, 2002). Meehan et al. (2006) reported that the majority of suicide completers in inpatient psychiatric settings were judged to be at no or low immediate risk during the most recent assessment. These findings highlight the problem in relying exclusively on self-report in assessing suicide risk.

These discrepancies are often attributed to methodological issues, such as low base rate of suicidality, despite the possibility that patient and clinician perceptions of suicide may be somewhat different. It is possible that the apparent independence of self-reported suicide risk and actual behaviors may have stemmed from other variables that affect patient's self-reported suicidal ideation. For example, purposeful concealment of suicidal ideation and plans, exacerbation of suicidal symptoms following a suicide risk

assessment, and unawareness or lack of insight into suicidal thoughts may interfere with a more realistic self-report of suicidal ideation (Nock & Banaji, 2007b). Overall, empirical evidence indicates that suicidal individuals may be prone to reporting a level of suicide risk that does not correspond to their objective level of suicide risk. Thus, exclusive reliance on self-report measures is problematic.

1.2.3.2 Implicit Measures

Given the weaknesses of self-report measures, there has been an increased interest in alternative methods of suicide risk assessment, primarily the implicit measures of suicide risk. “Implicit attitudes are introspectively unidentified (or inaccurately unidentified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects” (Greenwald & Banaji, 1995, p. 8). Wilson, Lindsey, and Schooler (2000) expanded this definition by suggesting that implicit attitudes are “evaluations that (a) have an unknown origin... (b) are activated automatically, and (c) influence implicit responses...” (p. 104). The construct of implicit attitudes has been applied to a growing body of research.

Implicit attitudes are assessed using performance-based measures. “Measuring implicit responses is less like an archeological dig and more like fishing in a river. Implicit tests tap attitudes upstream, but explicit tests catch what flows downstream, muddied in the editing for public report” (Payne, Burkley, & Stokes, 2008, p. 16). Thus, implicit measures are believed to tap into automatic processes without an opportunity to edit the responses. Of particular importance, implicit attitudes have been hypothesized to guide behavior in a spontaneous and affective manner, independent of deliberate and

conscious processes (Fazio, 1990). Consequently, implicit measures have important implications for conceptualizing the discrepancy between self-reported suicidality and actual behaviors.

To address the issue of discrepancy between self-report and actual suicidal behaviors found in previous studies, the present study looked at the role of implicit identification with self-injury and implicit attitudes towards self-injury.

It is of interest to know whether these differential implicit perceptions co-occur with varying intensities of distress, nature and number of prior suicidal attempts, clinical variables, and overall suicide risk. Insight into implicit attitudes towards self-harm and suicidality can indicate differential prognostic expectations and thereby entail different therapeutic interventions. Thus, the inclusion of implicit attitudes in psychological theorizing about suicidality is expected to serve as a means to link our current understanding of the risk and protective factors and the actual suicide potential. By linking suicidality to issues that concern the self, psychological theories of suicidality will potentially be able to make better sense of the maladaptive behaviors and symptoms and the co-occurring risk and protective factors. Given the extent of distress inherent in suicidality as a major health problem, it is important that theories and research explore all possible mechanisms relevant to the maintenance or development of suicidality. It is hoped that this broader focus in conceptualization of suicidality will lead to newer and/or better prevention and treatment strategies.

1.2.3.3 Existing Research on Attitudes

As previously noted, research studies in the field of suicidality, including the ones examining attitudes have primarily relied on self-report measures. Furthermore, most research in this area of investigation has focused on the attitudes of the general population (Mofidi, Ghazinour, Salander-Renberg, & Richter, 2008) or health practitioners (Anderson & Stander, 2007; Berlim, et al., 2007; Nirui & Chenoweth, 1999). Of the studies that have looked at individual's perceptions of own suicidality, most have explored whether a past history of suicidal ideation and/or attempts is associated with liberal attitudes towards suicide. For instance, Stein, Brom, Elizur, and Witztum (1998) found a significant association between generally approving attitude towards suicide and suicidal ideation. Similarly, Beautrais, Horwood, and Fergusson (2004) examined knowledge and attitudes to suicidal behavior in a birth cohort of New Zealand-born young adults and found that individuals with a family history of suicide, and those with a personal history of suicidal ideation or attempt, tended to hold more liberal attitudes about suicide. They concluded that an individual's attitudes to suicide are, to some extent, shaped by personal experience and, to some extent, may shape personal suicidal behaviors and responses.

Chesley and Loring-McNulty (2003) looked at the subjective experience of the suicidal individual and factors that contribute to survival following a suicide attempt. These investigators found that feelings of sadness, depression, disappointment, and emptiness were the emotions most often experienced in the period immediately following a suicide attempt. However, attempters later felt glad or grateful that they had survived.

These authors concluded that attempters were able to find meaning in life following an attempt.

1.2.3.4 Importance of Implicit Suicidality

Thus, little is reliably known about suicidal individuals' implicit perception of suicidality. At least two strands of conceptual work can be invoked to emphasize the importance of studying the role of implicit perceptions. First, from health psychology literature, the perception of illness impacts help-seeking behaviors, adherence to treatment, and response to treatment (Manber et al., 2003). Leventhal's self-regulation theory (Leventhal, 1970; Leventhal, Meyer, & Nerenz's, 1980) postulates that illness representations in the form of identity (name of label placed on the disease), timeline (expectations about the duration and the characteristic course of the disease), consequences (the believed consequence), causes (personal ideas about the causal mechanism), and controllability/cure (beliefs about the degree to which the disease is amenable to control or cure) have implications for behaviors. Controllability of symptoms has been emphasized in almost all physical and psychological conditions and particularly in relation to suicidality since suicidal symptoms have been demonstrated to become progressively uncontrollable. To illustrate, Joiner and Rudd (2000) demonstrated that suicidal symptoms are progressively triggered by cognitive and emotional variables rather than stressful life events (Joiner & Rudd, 2000).

Second, literature on psychotherapy (particularly client centered and psychodynamic psychotherapy) emphasizes that the overarching goal is to heighten

client's awareness of their symptoms and/or patterns (Greenberg & Paivio, 1997). Thus, the meaning of suicidality and the functions it serves for the client needs to be explored.

1.3 Present Study

Previous research has implicated acquired capability for suicide, internal-perturbations based reasons, and implicit identification with self-injury as important predictors of suicidal behaviors. Using hierarchical multiple regression, we hypothesized that acquired capability for suicide and internal perturbation based reasons would account for significant variance in clinician judgment of suicide risk, observation level, and lethality, independently of depression and hopelessness. By suggesting that acquired capability for suicide and internal perturbation based reasons are unique correlates and predictors of suicidality, such a finding would have theoretical significance and would also suggest that these factors should be a target of intervention strategies.

Understanding the relations between implicit attitudes and suicidal behaviors was the second goal of this study. We examined the implicit identification with self-injury and implicit attitude towards self-injury of attempters and non-attempters.

The identification of measures most related to suicidal ideation, clinician-judgment of suicide risk, observation level, and lethality was believed to serve two important functions. First, this study has implications for improving suicide screening procedures and provides direction for more comprehensive suicide risk assessment. Second, the results of this study also have implications for prevention of suicidality as well as furthering our understanding of suicide risk factors.

Chapter 2

Method

2.1 Participants

One hundred patients were recruited from February 2009 through June 2009 from three psychiatric hospitals – Northwest Ohio Psychiatric Hospital, Toledo, Ohio; Northcoast Behavioral Healthcare, Cleveland, Ohio; and Northcoast Behavioral Healthcare, Northfield, Ohio. Miles and Shelvin's (2001) criteria on required sample size for a regression analysis depending on the number of predictors and the size of expected effect indicated that a total of 100 participants were needed to conduct multiple regression analyses with five independent variables in order to have 80% confidence of detecting a medium effect in the current study (i.e., power = .80) with alpha set at .05, 2-tailed.

The total sample consisted of 63 males and 37 females ranging in age from 18 to 63 years ($M = 35.84$, $SD = 11.44$). The sample was 64% Caucasian, 29% African American, 4% Hispanic, and 3% biracial. Years of education ranged from 7 to 17 ($M = 12.11$, $SD = 1.86$). Seventy-three percent of the patients were single, 5% were married, 16% were divorced, and 6% were separated. Ninety-seven percent of the patients identified their sexual orientation as heterosexual, 2% as homosexual, and 1% as bisexual.

Among all 100 patients, 55% were involuntarily civilly committed, 11% were committed pursuant to judicial proceedings, 1% voluntarily admitted themselves, 21% were admitted by criminal courts as Not Guilty by Reason of Insanity (NGRI), and 12% were admitted during the pretrial phase of the criminal justice process as incompetent to stand trial. Among the 33 forensic patients, 91% were charged with a felony, and 9% with a misdemeanor. Charges included murder, attempted murder, rape, arson, assault, robbery, burglary, stalking, kidnapping, abduction, drug trafficking, disorderly conduct, theft, public indecency, reckless driving, domestic violence, resisting arrest, criminal damaging, and probation violation.

Of the sample, 25% had a diagnosis of Major Depressive Disorder, 22% were diagnosed with Schizoaffective Disorder, 21% with Schizophrenia, 18% with Bipolar Disorder, 11% with Psychotic Disorder Not Otherwise Specified (NOS), 1% with Oppositional Defiant Disorder, 1% with Unspecified Episodic Mood Disorder, and 1% with Impulse Control Disorder. Eighty-two percent of the patients were diagnosed with a comorbid substance abuse disorder. Personality disorder diagnosis was present in 39% of patients, deferred in 51% of patients, and absent in 10%. The most common primary Axis II diagnosis was Antisocial Personality Disorder (59%), followed by Borderline Personality Disorder (18%) and Personality Disorder NOS (18%); and the least common were Narcissistic Personality Disorder (2.5%) and Paranoid Personality Disorder (2.5%). Fourteen percent of the patients had two personality disorder diagnoses; the most common secondary personality disorder diagnosis was Borderline Personality Disorder. The number of days of hospitalization ranged from 1 to 3391 days ($M = 202.89$, $SD =$

570.44). Axis V Global Assessment of Functioning (GAF) level at admission ranged from 10 to 65 ($M = 37.17$, $SD = 12.77$).

2.2 Measures

Seven primary measures constituted the basis of the current study.

2.2.1 Acquired Capability for Suicide Scale (ACSS; Bender, Gordon, & Joiner, 2007)

Acquired capability for suicide was measured with the Acquired Capability for Suicide Scale, developed by Bender, Gordon, and Joiner (2007). The ACSS consists of 20 items that assess fearlessness about lethal self-injury (Appendix A). Individuals respond to each item on a 1 (*not at all like me*) to 5 (*very much like me*) scale. Examples of items include “Things that scare most people don’t scare me” and “I can tolerate more pain than most people.”

ACSS is negatively correlated with Linehan, Goodstein, Nielsen, and Chiles’s (1983) Fear of Suicide subscale of the Reasons for Living Inventory ($r = -.48$, $p < .0001$; Bender et al., 2007). The ACSS has been found to be positively correlated with item 14 of the Beck Scale for Suicide Ideation (BSS) that asks about one’s courage to kill oneself ($r = .79$, $p = .007$; Bender et al., 2007). ACSS has been shown to be unrelated to the BSS ($r = .09$, $p = .35$) or the Beck Depression Inventory (BDI) ($r = -.11$, $p = .24$; Bender et al., 2007) and these findings are consistent with the assumption that acquired capability for suicide is distinct from current distress/ depression.

2.2.2 Reasons for Attempting Suicide Questionnaire (RASQ; Holden, Kerr, Mendonca, & Velamoor, 1998; Johns & Holden, 1997)

The RASQ is a 14-item self-report structured measure designed to assess suicidal motivations (Appendix B). Each item is rated on a five-point scale that is scored from 1 (*disagree completely*) to 5 (*agree completely*). The RASQ consists of two subscales – Internal Perturbation Based Reasons (INT) and Extrapunitive/Manipulative Motivations (EXT). Example of an item assessing INT includes “I have thought of or tried ending my life to punish myself.” Example of an item assessing EXT includes “I have thought of or tried ending my life because I was angry with someone and wanted to get back at him/her.” The RASQ was scored using Statistical Package for the Social Sciences (SPSS) 17.0 (Appendix C). INT and EXT scores were calculated provided a patient had no more than one missing response on each of the subscales.

The RASQ was developed based on reasons reported by suicide attempters (Bancroft et al., 1979). Holden et al. (1998) factor analyzed the items of the instrument in a sample of patients in a psychiatric hospital crisis unit and obtained two factors - extrapunitive/manipulative reasons and internal perturbation based motivations. Holden and McLeod (2000) factor analyzed the items of the instruments in a nonclinical adult sample and obtained three distinct factors: internal perturbation based reasons, manipulative motivations, and extrapunitive motivations. The psychometric adequacy of the RASQ has been supported. The alpha coefficients for the internal perturbations based reasons and extrapunitive/manipulative motivation subscales were .80 and .71 respectively (Holden et al., 1998). In terms of validity, the internal perturbation based reasons subscale has been demonstrated to predict patient’s self-reported degree of

wanting to die, clinicians' judgment of patient's current intent to die, and clinician's judgment of probability of suicide completion (Holden et al., 1998). The three factors identified by Holden and McLeod (2000) have been found to significantly differentiate between attempters and non-attempters. Furthermore, scores on the internal perturbations component has been demonstrated to provide incremental validity relative to scores on scales of hopelessness (Holden et al., 1998) or depression (Johns & Holden, 1997). In general, the internal perturbations based reasons scale has found to have greater empirical validity for predicting suicide criteria than the extrapunitive/manipulative scale.

2.2.3 Self-Injury Implicit Association Test (SI-IAT, Nock & Banaji, 2007)

The SI-IAT is a computer test designed to measure the implicit associations about self-injury. The Implicit Association Test (IAT) measures the strength of automatic association between representations of concepts by requiring rapid categorization of various stimuli. It is based on the assumption that easier pairings and the associated faster responses are indicative of stronger association than difficult pairings and the associated slower responses.

Stimuli were presented one at a time in the center of the computer screen and participants were instructed to classify them to the group labels appearing on the top half of the screen. Participants were instructed to press keys "e" (for stimuli to be classified on the left) and "i" (for stimuli to be classified on the right) immediately following the presentation of a stimulus. In this version of the IAT, following correct responses, participants were presented with the next stimulus. However, following an incorrect

response, a red “X” appeared below the stimulus and remained on the screen until the correct key was pressed. The importance of both speed and accuracy was emphasized.

In the present study, three different IATs were administered:

The Flowers-Insects/Good-Bad IAT involved presentation of Flower names (*Daffodil, Tulip, Rose, Daisy, and Sunflower*) or Insect names (*Ant, Bugs, Fly, Dragonfly, and Caterpillar*) classified as “*Flower*” or “*Insect*” along with Favorable words (*Relief, Peace, Pleasure, Effective, and Helpful*) or Unfavorable words (*Incorrect, Ineffective, Wrong, Painful, and Worse*) classified as either “*Good*” or “*Bad*.” The first block introduced the target stimuli (e.g. *Flowers* and *Insects*); block two introduced the attribute stimuli (e.g. *Good* and *Bad*); block three presented a pairing of both targets and attributes (e.g. *Flowers + Good, Insects + Bad*); block four re-presented the attribute stimuli, though now on the opposite side of the screen (e.g. if *Good* was presented on the right during block two, it now appeared on the left); and the final block presented the inverse of the pairing presented in block three (e.g. *Flowers + Bad, Insects + Good*). Only blocks three and five (the pairings) were used in the scoring. Blocks one, two, and four were provided for familiarization and did not influence the scoring.

The SI-IAT that measures implicit identification with self-injury (i.e., the extent to which self-injury is associated with self) involved presentation of self-relevant words (*Myself, I, Mine, Self, and My*) or other-relevant words (*Their, Them, They, Other, and Theirs*) classified as “*Me*” or “*Not Me*” along with self-injury images (e.g., pictures of skin that has been cut –) or neutral images (i.e., pictures of non-injured skin –) classified as either “*Cutting*” or “*No Cutting*.” The SI-IAT uses images of cutting because it is clearly associated with self-injury, unlike firearms or tall buildings that may not always

be associated with self-injury. In one block, patients were required to press the same computer key in response to both “Cutting” and “Me” stimuli, and the other computer key for “No Cutting” and “Not Me” stimuli. In the second critical test block, the opposite sorting was performed, pairing “Cutting/Not Me” on the same computer key and “No Cutting/Me” on the other.

The SI-IAT that measures implicit attitude about self-injury (i.e., the extent to which self-injury is associated with being a favorable vs. unfavorable behavior) involved the presentation of favorable words (*Relief, Peace, Pleasure, Effective, and Helpful*) or unfavorable words (*Incorrect, Ineffective, Wrong, Painful, and Worse*) classified as either “Good” or “Bad” along with self-injury or neutral images classified as either “Cutting” or “No Cutting.” In one block, participants were required to press the same computer key in response to both “Cutting” and “Good” stimuli and the other computer key for “No Cutting” and “Bad” stimuli. In the second critical test block, the opposite sorting was performed, pairing “Cutting/Bad” on the same computer key and “No Cutting/Good” on the other.

The IAT began with a brief introduction,

“Words will appear one at a time in the middle of the screen. Classify these words into groups which will be designated with labels appearing on top half of the screen. All words belonging to the groups on the left will be classified with the “e” key. All words belonging to the groups on the right will be classified with the “i” key. Classify the words as quickly as possible while making as few mistakes as possible. Accuracy and speed are both important. Pay close attention to the group labels, they will change from block to block. Direct any questions to the experimenter.”

The order of administration of the Flowers-Insects IAT and two SI-IATs was fixed, that is, the Flowers-Insects IAT always preceded the SI-IATs. For counterbalancing, the presentation order of the identity and attitude versions varied across patients. Furthermore, the presentation of pairings within the attitude and identity versions of the IAT was counterbalanced. For example, even numbered patients first saw *Cutting* paired with *Good* and *No Cutting* paired with *Bad*, and odd numbered patients first saw the inverse pairing. Table 2.1 describes the blocks of the three IATs. For each of the pairings of the attitude and identity versions of the IAT, patients were presented with one practice and one test trial block.

Table 2.1: Order of the Three Implicit Association Tests

Block	Number of Trials	Type of Trial	Left Response	Right Response
1	20	Practice	Flowers	Insects
2	20	Practice	Bad	Good
3	20	Practice	Flowers + Bad	Insects + Good
4	40	Test	Flowers + Bad	Insects + Good
5	20	Practice	Insects	Flowers
6	20	Practice	Insects + Bad	Flowers + Good
7	40	Test	Insects + Bad	Flowers + Good
8	20	Practice	Cutting + Not Me	No Cutting + Me
9	40	Test	Cutting + Not Me	No Cutting + Me
10	20	Practice	No Cutting + Not Me	Cutting + Me
11	40	Test	No Cutting + Not Me	Cutting + Me
12	20	Practice	Cutting + Bad	No Cutting + Good
13	40	Test	Cutting + Bad	No Cutting + Good
14	20	Practice	No Cutting + Bad	Cutting + Good
15	40	Test	No Cutting + Bad	Cutting + Good

Note. The presentation order of identity and attitude versions varied across patients. The presentation of pairings within the attitude and identity versions of the IAT was counterbalanced.

Prior to the attitude version of the SI-IAT, following instructions appeared on the screen,

“For the next portion of the study, you will be asked to classify “images” into categories of Cutting and No Cutting, as well as words related to Good and Bad. The words related to Good and Bad are shown below. Remember when the word or image in the center corresponds to the category on the left, you will use the “e” key, and when the word or image in the center corresponds to the category on the right, you will use the “i” key. Classify the words and images as quickly as possible while making as few mistakes as possible.”

Prior to the identity version of the SI-IAT, following instructions appeared on the screen,

“For the next portion of the study, you will be asked to classify “images” into categories of Cutting and No Cutting, as well as words related to Me and Not Me. The words related to Me and Not Me are shown below. Remember when the word or image in the center corresponds to the category on the left, you will use the “e” key, and when the word or image in the center corresponds to the category on the right, you will use the “i” key. Classify the words and images as quickly as possible while making as few mistakes as possible.”

In addition to these instructions, all the patients were exhaustively informed on the tasks by the investigator to make certain they fully understood the task.

Inquisit 3.0 recorded the accuracy and the response times (in milliseconds) to each trial. Following the recommendations of Greenwald, Nosek, and Banaji (2003), response latencies of the practice and test blocks that involved pairings were analyzed

using the most recent IAT scoring algorithm in SPSS. Trial latencies greater than 10,000 milliseconds were deleted. Standardized D score was obtained by subtracting the mean latency of one pairing (e.g., *Cutting/Me*) from the mean latency of opposite pairing (e.g., *Cutting/Not Me*). This difference was divided by the single standard deviation of both pairings. The formula expressing the operations necessary to obtain the D score is shown below:

$$D = \frac{\text{Mean2} - \text{Mean1}}{SD}$$

D score indicates the relative strength of the association between the concepts relative to the inverse pairings. The range of the D score is from -2.0 to 2.0. A D score of zero indicates identical response times for each pairing, and greater or lesser values indicate the strength of association (i.e., faster vs. slower latency) for one pairing relative to the other. A positive or negative D score indicates the direction of the association (e.g., identification with cutting vs. identification with no cutting).

Following recommendations of Greenwald et al. (2003), a patient's D score was eligible for further analyses if the following conditions were satisfied: (1) the average latency of a patient was not greater (too slow responding) or lesser (too fast responding) than two standard deviations from the mean D score of the given IAT, (2) less than 11% of the trials were faster than 400 milliseconds, and (3) error rate was less than 33.3%. Thus, latencies and error rates of all patients were examined; however, none of the patients' scores needed to be deleted for these reasons.

Nock and Banaji (2007a) compared the performance of self-injurers and non-injurers on the identity version of the SI-IAT and found that self-injurers strongly associated self-injury with self while non-injurers did not. Nock and Banaji (2007b)

found significant differences between non-suicidal adolescents, suicide ideators, and attempters on the identity version of the SI-IAT. Non-suicidal participants demonstrated negative associations between self-injury and self, ideators demonstrated small positive associations, while attempters strongly associated self-injury and self. Of particular importance, identity version of the SI-IAT was more important than demographic and psychiatric risk factors in predicting non-suicidal self-injury, current suicide ideation, and attempt status.

2.2.4 Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974)

The BHS is a 20-item scale for measuring negative attitudes about the future. Eleven items are negatively phrased (e.g., “My future seems dark to me”) and nine items are positively phrased (e.g., “I can look forward to more good times than bad times”). The scale has good reliability and validity (Beck & Steer, 1988; Dyer & Kreitman, 1984; Linehan & Neilsen, 1981).

2.2.5 Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979)

The BDI is a frequently used 21-item self-report inventory designed for the assessment of depressive symptomatology. A score of 0–3 is assigned for each item, and total scores for the BDI range from 0–63, with higher scores representing a higher occurrence of symptoms associated with depression. The BDI has been shown to have high reliability and validity in psychiatric and non-psychiatric samples (Beck, Steer, & Garbin, 1988).

2.2.6 Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991)

The BSS is a 21-item self-report inventory designed for the assessment of suicidal symptoms. Items 1–19 measure suicidal ideation, and items 20 and 21 assess past attempts and are not used in the calculation of the BSS total score. A score of 0–2 is assigned for each item, and total scores for the BSS range from 0–38, with an increase in score representing a higher level of suicidal ideation and possible intent.

2.2.7 Suicide Assessment Checklist (SAC; Rogers, 1990)

The SAC is a 21-item clinician-administered measure that assesses suicide risk. The SAC consists of 12 client status and demographic items and 9 psychological, psychosocial, and clinical items. The 9 psychological, psychosocial, and clinical items are rated on a 1 to 5 scale and the 12 categorical items are scored based on assigned item values derived from prior research. The scores on all the items are added to create a total score that may range from a minimum of 11 to a maximum of 108, with higher scores indicative of higher suicide risk. To facilitate consistent use, the SAC contains definitions and explanations of the terms used in the scale.

Rogers, Alexander, and Subich (1994) outlined the following as the primary considerations in the development of the checklist: (a) it should have a broad population focus, (b) it should be usable across the differential training and experience levels of emergency room clinicians, (c) it should be a brief yet relatively comprehensive measure, and (d) it should have psychometric integrity. Additionally, they outlined three major objectives underlying the construction of the SAC: (a) to provide a semi-structured guide for the assessment interview, (b) to provide a standardized means of risk assessment that

could inform the clinical decision process, and (c) to develop a measure that could provide clear documentation of the risk assessment protocol.

Reliability evaluations of the 9 rated items have identified alpha values ranging from .69 to .87 (Kene-Allampalli, Hovey, Meyer, & Mihura, 2010; Rogers & Alexander, 1989). Interrater reliability coefficients have ranged from .83 to .87 (Kene-Allampalli et al., 2010; Rogers & Alexander, 1994), and test-retest reliability over a 4-week period was .82 (Rogers & Alexander, 1994). Criterion- and content-related validity evidence has been promising. Criterion-related validity evaluations have found significant differences in total SAC scores of involuntary inpatients, voluntary inpatients, and outpatients. Examinations of construct-related validity indicate that the SAC can differentiate between non-suicidal individuals, ideators, and attempters; that the SAC has convergent validity with the conceptually similar items of the BDI; and that the SAC accounts for greater variance in suicide risk at intake than does the BDI (Rogers et al., 2002). Parts 1 and 2 of the SAC have been found to have significant positive correlations with the Suicide Ideation Scale and Suicide Potential Index of the Personality Assessment Inventory (Kene-Allampalli et al., 2010). Lastly, content-related validity examinations suggest that 19 of the 21 items significantly contribute to the prediction of reason for referral (suicide ideation, suicide attempt, or issues unrelated to suicide) and that 15 of the 21 items significantly contribute to the prediction of the referral setting (home, voluntary inpatient, or involuntary inpatient) (Rogers et al., 2002).

2.2.8 Observation Level

Observation of patients involves allocation of a nurse to “observe” a patient determined to be at risk. Individual observation is the major technique utilized to keep the acutely suicidal patient safe from self-harm in inpatient psychiatric settings. The Joint Commission requires “around-the-clock observation” for patients determined to be at high suicide risk (Joint Commission, 1998). Higher levels of observation are used for a variety of high risk behaviors - suicide, self-harm, violence, elopement, and sexually disinhibition (Bowers, Gournay, & Duffy, 2000).

For the purposes of the present study, observation level assignments relevant exclusively to suicide risk were recorded. The following levels of observation were being used at the three hospitals where data were collected: Q30 (Routine Observation) is the minimum acceptable level of observation for *all* in-patients; Q30 (Suicide Precaution Observation) involves checking patient’s location every 30 minutes. This level of observation is used when the patient is determined to be at mild risk. That is, the patient is potentially, but not immediately, at risk; Q15 observation involves checking patient’s location every 15 minutes. This level of observation is used when the patient is determined to be at moderate risk; Q1: This observation level is used when the patient could, at any time, make an attempt to harm himself/herself. The patient is kept within sight at all times although the staff member may be required to observe the patient at arm’s length.

Assessments are performed per shift for the first 72 hours when a patient is admitted due to a suicide attempt, suicidal ideation, or self-destructive actions. Patients are rated as high, moderate, low, or no risk and appropriate observation level is ordered.

If a change is found in patient's status, corresponding change in observation level is made. Anecdotally, the patient's psychiatrist typically decides the risk level and assigns the observation level. Because we were interested in *current* suicide risk, observations levels during the four weeks prior to the survey date were incorporated into the study.

2.2.9 Lethality of Suicide Attempt Rating Scale (LSARS; Smith, Conroy, & Ehler, 2002)

The LSARS is a standardized clinician-rated measure of likelihood of death following a suicide attempt (either past or present), which provides a lethality score based on the medical severity of the suicide attempt *and* the circumstances surrounding the attempt, particularly the possibility of detection and intervention, help-seeking behaviors, and the availability of medical intervention related to the method. Ratings range from 0 to 10 wherein 0 = Death is an improbable result of the "suicidal" behavior; 1 = Death is very high improbable; 2 = Death is improbable as an outcome of the act; 3.5 = Death is improbable so long as first aid is administered by victim or other agent; 5 = Death is a 50-50 probability directly or indirectly, or in the opinion of the average person, the chosen method has an equivocal outcome; 7 = Death is the probable outcome unless there is "immediate" and "vigorous" first aid or medical attention by victim or other agent; 8 = Death would be ordinarily considered the outcome of the suicidal act; 9 = Death is a highly probable outcome; 10 = Death is almost a certainty regardless of the circumstances or interventions by an outside agent. Higher scores indicate greater lethality. LSARS provides extensive and thorough descriptions of attempts at each level of rating. The instrument includes cutting and ingestion at each rating level thereby

indicating that lethality is not exclusively determined by a general category of method (e.g., overdose) alone.

The LSARS has been demonstrated to possess good concurrent validity and interrater reliability in previous investigations (Berman, Shepherd, & Silverman, 2003; Diamond et al., 2005; Goldston, 2003; Handwerk, Larzelere, Friman & Mitchell, 1998; Smith et al., 2002).

To complete the LSARS, details of present and past suicidal behaviors, their lethality, and dates were obtained from patient's medical record. Because we were interested in overall lethality, only the most lethal attempt was incorporated into the study.

2.3 Procedure

This study was approved by the University of Toledo's (UT) Institutional Review Board, Ohio Department Mental Health's (ODMH) Institutional Review Board, Office of Program Evaluation and Research of ODMH, and the three hospitals - Northwest Ohio Psychiatric Hospital, Toledo; Northcoast Behavioral Healthcare, Cleveland; and Northcoast Behavioral Healthcare, Northfield – where data were collected. These three psychiatric hospitals are operated by ODMH and provide comprehensive treatment to individuals with SPMI in compliance with the national healthcare standards of the Joint Commission.

All patients were informed of the study and were invited to participate during on-unit groups or individually. The investigator explained the nature, purpose, and goals of the study, and potential risks involved in participation. The investigator emphasized that

enrolling in the research was voluntary and that patients may withdraw from the study at any time without penalty or loss of privileges. To be included in the study, patients were asked to provide informed consent. Patients were excluded from the study if they refused to provide informed consent, were identified as having a developmental disability or dementia, were unable to complete the IATs and/or self-report measures, or posed a danger to the investigator.

The patients that agreed to participate in the study first reviewed and signed a statement of informed consent (Appendix D) detailing the purpose, procedures, and goals of the study. For patients with guardians, consent was obtained from the legal guardians. Patients were administered the self-report measures and IATs by the investigator (clinical psychology doctoral student). The IATs were administered on a Dell Inspiron 630m personal computer using Inquisit 3.0 purchased from Millisecond Software. The investigator was passively present in the room during the administration of the IATs. All patients were administered the IATs and self-report in a fixed order, that is, the IATs always preceded the self-report measures.

Of the patients who participated in the study ($N = 205$) approximately 51% were excluded. Primary reasons for exclusion included aggressive behavior or the inability to complete the measures. Patients that were included in the study did not differ from nonparticipants on gender, ethnicity, duration of hospitalization, and diagnoses; however, patients that participated were younger and had higher levels of education than patients that were excluded.

To complete the SAC, LSARS, and to determine observation level, patient's medical record (consisting of narrative summary, social work release summary,

psychiatric examination, history and physical, psychological evaluation, social work assessment, progress notes, treatment plan, and consultation) from the time of patient's admission to the survey date or until patient's discharge (whichever came first) was reviewed. The patient's treatment team (consisting of psychiatrist, psychologist, nurse practitioner, social worker, pharmacist, dietician, and rehabilitation staff member) typically participates in the process of clinical documentation.

The investigator was blind to the patient's responses on the self-report measures and IAT to control the influence of rater biases and expectations when completing the SAC and LSARS. To keep the investigator blind to the information on the self-report measures and IATs that could possibly influence ratings on the SAC and LSARS, chart review was conducted before the patient completed the self-report measures and IATs.

Responses to the questions about suicide were screened by the investigator for severe suicide risk. If a patient's score on the BSS exceeded the cut-off of 27 and/or the patient reported suicidal plans on the BSS, this information was documented in the patient's chart and the treatment team was notified. All patients that participated in the study were debriefed and were reimbursed with hygiene items worth \$1.

2.4 Data Analyses

Frequency analyses were conducted to examine the prevalence of suicidality. Descriptive statistics for demographic and clinical variables such as age, marital status, gender, ethnicity, educational level, duration of hospitalization, Axis I and Axis II diagnoses, substance abuse, forensic vs. non-forensic status, and legal charges (felony vs. misdemeanor) were computed. Similarities and differences on the demographic and

clinical variables across the forensic and non-forensic patients, attempters and non-attempters, and patients who had attempted suicide at varying intervals prior to the survey date were examined. Means, ranges, standard deviations, and intercorrelations were computed for all the measures employed in the present study. Additionally, preliminary analyses were conducted to determine the internal consistency of each instrument included as part of the questionnaire packet.

The relationship between the continuous demographic and clinical variables (age, GAF, duration of hospitalization) and the criterion variables were measured with correlational analyses. In order to determine whether the dependent variables varied as a function of the demographic and clinical variables such as gender, marital status, ethnicity, Axis I diagnosis, Axis II diagnosis, substance abuse, legal status, and type of charges, several ANOVAs were performed. When post hoc tests were used, Type I error rate was controlled using the Holm Multistage Bonferroni procedure (Holm, 1979; Howell, 2007; Larzelere & Mulaik, 1977). This posthoc procedure involved adjustments to uncorrected p-values based on the total number of pair-wise group comparisons being performed.

Correlations were performed to examine the extent to which each set of predictors were related to the dependent variables at the bivariate level. Based on previous literature, three specific hypotheses were examined: (1) Acquired capability (ACSS) would be positively associated with clinician judgment of suicide risk (SAC), observation level, and lethality (LSARS), but would be unrelated to depression (BDI) and suicide ideation (BSS); (2) Internal perturbation based reasons (INT) as measured by the RASQ would be strongly positively associated with clinical judgment of suicide risk (SAC),

observation level, and lethality (LSARS); and (3) Internal perturbation based reasons would be more strongly related to suicide risk than extrapunitive/manipulative reasons (EXT).

Hierarchical multiple regression analyses were used to identify which measures would optimally predict results from the criterion measures. Four variables were designated as criterion variables: BSS, SAC, observation level, and LSARS. Four variables were selected as potential predictors: scores on the ACSS, INT, BDI, and BHS. The regression analyses did not examine EXT and the SI-IATs as predictors because they were not correlated with the criterion variables. The general F test for increments in variance accounted for were used to test the significance of each independent variable's contribution to the squared multiple correlation at the point of entry to the regression (Cohen & Cohen, 1975). Prior to conducting the above described analyses, the data were examined to ensure that all statistical assumptions required for these analyses were met in this data set. Following the recommendations of Cohen, Cohen, West, and Aiken (2003), regression lines were plotted to determine impact on the dependent variables as a function of levels of each of the predictors.

Multinomial logistic regression analyses were conducted to determine which measures would optimally predict patients at 1:1 observation level, 15-minute observation level, 30-minute suicide precaution observation level, and 30-minute routine observation level. The factors examined were BDI, BHS, ACSS, and INT. The 30-minute routine observation group was the reference group.

Differences between attempters and non-attempters on the attitude and identity versions of the SI-IAT were measured with two independent-sample t tests. It was

hypothesized that the attempters would show positive identification with self-injury while non-attempters would show negative association between self-injury and self. It was also hypothesized that attempters would demonstrate more favorable attitudes towards self-injury than the non-attempters.

Chapter 3

Results

3.1 Descriptive Statistics

To establish the adequacy of the measures used in this study, psychometric properties of each measure were evaluated. Table 3.1 presents means, standard deviations, and internal consistencies for the criterion and predictor variables. Alpha coefficients for the predictor variables ranged from 0.80 (Internal Perturbations Based Reasons Subscale of the RASQ) to .95 (BDI), and for the criterion variables from .86 (Part 2 of SAC) to .97 (BSS). The alpha coefficients indicate good to excellent levels of clinical significance (Cicchetti, 1994).

Mean average latency for the Attitude version of the SI-IAT was 1655.79 milliseconds ($SD = 460.13$) and for the Identity version was 1704.37 milliseconds ($SD = 536.13$). The mean error percentage for the Attitude version, as recorded by the computer, was 6.25 ($SD = 5.84$) and for the Identity version 7.02 ($SD = 6.71$). As previously noted, none of the patients had an error percentage greater than 33.33. None of the patients had more than 6.67% of latencies less than 400 milliseconds. As noted above, Greenwald et al., (2003) indicate that latencies less than 400 milliseconds imply too fast responding and latencies more than 10,000 milliseconds imply too slow responding.

Table 3.1: Alpha, Means, and Standard Deviations of the Criterion and Predictor Variables (N = 100)

<i>Variables</i>	<i>Mean</i>	<i>S.D.</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Alpha</i>
Predictor Variables					
ACSS	45.76	16.24	0	80	.87
RASQ	39.52	12.83	14	69	.86
INT	20.22	6.54	6	30	.80
EXT	19.30	9.17	8	39	.89
BDI	22.41	16.12	0	63	.95
BHS	6.49	6.22	0	19	.94
SI-IAT-A	-.53	.35	-1.31	.26	N/A
SI-IAT - I	-.29	.41	-1.16	.67	N/A
Criterion Variables					
BSS	7.6	10.96	0	39	.97
SAC (Part2)	40.72	16.31	18	90	.86
Observation	3.14	1.10	1	4	N/A
Lethality	5.01	3.20	0	10	N/A

Note. ACSS = Acquired Capability for Suicide Scale; RASQ = Reasons for Attempting Suicide Questionnaire; INT = Internal Perturbation Based Reasons Subscale of RASQ; EXT = Extrapunitive/Manipulative Motivations Subscale of RASQ; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; SI-IAT-A = Attitude version of the Self-Injury Implicit Association Test (Cutting/No Cutting – Good/Bad); SI-IAT-I = Identity version of the Self-Injury Implicit Association Test (Cutting/No Cutting – Me/Not Me); BSS = Beck Scale for Suicide Ideation; SAC = Suicide Assessment Checklist; Observation = Observation Level (1 = 1:1 observation, 2 = 15-minute observation, 3 = 30-minute suicide precaution observation, 4 = 30-minute routine observation); Lethality = Lethality of Suicide Attempt Rating Scale; RASQ, INT, EXT, Lethality ($N = 60$); SI-IAT-A and SI-IAT-I ($N = 98$, negative values = healthy response; positive values = unhealthy response).

3.2 Incidence of Suicidality

The majority of patients (60%) had attempted suicide at least once. The number of suicide attempts ranged from a minimum of 0 to a maximum of 55 and the mean number of suicide attempts was 2.22. Among the patients with at least one suicide attempt, 41.67% had attempted suicide in the 18-day period prior to the survey date, 5% had attempted suicide in the 19-day to two-month period prior to the survey date. A much

larger percentage of patients (53.33%), however, attempted suicide in the 60-day to 10-year period prior to the survey date. In terms of methods of attempt, overdose/poisoning was the most common (71.67%), followed by cutting (35%), hanging (23.33%), and jumping (13.33%). The least common methods were car exhaust (3.33%), firearm (1.67%), and drowning (1.67%). Lethality of suicide attempts ranged from 0 to 10 ($M = 5.09$, $SD = 3.16$). The mean LSARS score indicated that considering the method chosen and circumstances surround the attempt; death was a 50-50 probability. During the four weeks before the survey date, 9.9% of patients were placed on 1:1 observation, 22.8% on 15-minute observation, 8.9% on 30-minute suicide precaution observation, and 56.4% on routine observation. Review of medical records revealed that command hallucinations to engage in self-harmful or suicidal behavior were present in 7% of the sample. Response to item 20 of the BSS that asks about previous suicide attempts was compared to information about prior suicidal behaviors derived from the patient's medical records to determine the correspondence between self-report ratings and objective information. As previously noted, 60 patients were classified as attempters based on the chart review. However, 11 (18.3%) of patients classified as attempters denied past history of suicide attempts on item 20 of the BSS. Of the 40 patients that were classified as non-attempters based on chart review, 6 (15%) reported prior suicide attempts.

While it is not recommended to dichotomize a continuous variable (Cohen, 1983), for the purpose of illustration, means scores on the criterion and predictor variables of patients who had attempted suicide in the 18-day period prior to the survey date were compared to the mean scores of patients who had attempted suicide during the 19 to 60-day period prior to the survey date, and patients who had attempted suicide during the 60-

day to 10-year period prior to the survey date. These comparisons are presented in Table 3.2. Patients who had attempted suicide in the 18-day period prior to the survey date had higher mean scores than the other two groups on all measures, except for the Extrapunitive/Manipulative Motivations Subscale of the RASQ. Patients who attempted suicide in the 18-day period prior to the survey were also more likely to be placed on 1:1 or 15-minute observation level. It is noteworthy that patients who had attempted suicide during the 60-day to 10-year period prior to the survey date had higher scores on all measures, except for BHS, than patients who had attempted suicide in the 19 to 60-day period prior to the survey date.

Table 3.2: Comparison of Mean Scores of Patients who Attempted Suicide in the 18-day Period Prior the Survey Date (N = 25), 19 to 60-day Period Prior the Survey Date (N = 3), and 60-day to 10-year Period Prior the Survey Date (N = 32)

<i>Variable</i>	<i>Time since Most Recent Suicide Attempt</i>		
	< 18 days	19 – 60 days	> 60 days
ACSS	51.52	29.67	38.06
INT	22.68	11.67	18.97
EXT	17.04	17.33	21.18
BDI	36.72	20	21.61
BHS	11.56	6	5.21
SI-IAT-A	-.58	-.79	-.51
SI-IAT- I	-.34	-.19	-.23
BSS	18.24	.67	6.67
SAC	57.52	32.33	41.53
Observation Level	1.96	3	3.36
Number of Attempts	5.72	1.67	2.27
LSARS	6.44	1.83	4.32

Note. ACSS = Acquired Capability for Suicide Scale; INT = Internal Perturbation Based Reasons Subscale; EXT = Extrapunitive/Manipulative Motivations Subscale; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; SI-IAT-A = Attitude version of the Self-Injury Implicit Association Test (Cutting/No Cutting – Good/Bad); SI-IAT-I = Identity version of the Self-Injury Implicit Association Test (Cutting/No Cutting – Me/Not Me); BSS = Beck Scale for Suicide Ideation; SAC = Suicide Assessment Checklist; Observation = Observation Level (1 = 1:1 observation, 2 = 15-minute observation, 3 = 30-minute suicide precaution observation, 4 = 30-minute routine observation); Lethality = Lethality of Suicide Attempt Rating Scale.

3.3 Differences between Non-Forensic, Forensic Pre-Trial, and NGRI

Patients

Table 3.3 summarizes the demographic and clinical characteristics of non-forensic, forensic pre-trial, and forensic NGRI patients. Non-forensic patients were more likely to be Caucasian than forensic patients. Pretrial patients were more likely to be diagnosed with Schizophrenia; NGRI patients were more likely to be diagnosed with Schizoaffective Disorder; and non-forensic patients were more likely to be diagnosed

with Major Depressive Disorder. As compared to non-forensic patients, forensic patients were more likely to be diagnosed with Antisocial Personality Disorder. With regards to the GAF, NGRI patients, overall, were the highest functioning, whereas non-forensic patients were the lowest functioning. As expected, non-forensic patients were hospitalized for much shorter periods of time.

Table 3.3: Comparison of Demographic and Clinical Characteristics of Non-Forensic Patients (N = 67), Forensic Pre-Trial Patients (N = 12), and Forensic NGRI Patients (N = 21)

Demographic/Clinical Characteristics	Non-Forensic	Forensic Pretrial	Forensic NGRI
Mean Age	35.15	37.08	37.33
Gender (% Male)	63	66.7	61.9
Ethnicity (%)			
Caucasian	70.1	41.7	57.1
African American	25.4	41.7	33.3
Hispanic	3	8.3	4.8
Other	1.5	8.3	4.8
Marital Status (%)			
Single	67.2	91.7	81
Married	6	8.3	0
Divorced	20.9	0	9.5
Separated	6	0	9.5
Sexual Orientation (%)			
Heterosexual	97	91.7	100
Homosexual	3	8.3	0
Mean Years of Education	12.24	11.42	12.10
Axis I Diagnosis (%)			
Schizophrenia	13.4	50	28.6
Schizoaffective	17.9	8.3	42.9
Bipolar Disorder	22.4	8.3	9.5
Major Depressive	34.3	0	9.5
Psychotic Disorder NOS	9	33.3	4.8
Other	3	0	4.8
Substance Abuse (%)			
Present	83	75	81
Axis II Diagnosis (%)			
Antisocial	13.4	41.7	42.9
Narcissistic	0	0	4.8
Borderline	10.4	0	0
Paranoid	1.5	0	0
Other	9	0	4.8
None/Deferred	65.7	58.3	47.6
Mean GAF	32.82	39.33	49.81
Mean Days since Admission	16.01	133.33	838.86

Note. NGRI = Not Guilty by Reason of Insanity; GAF = Global Assessment of Functioning; Other Axis I diagnosis included Oppositional Defiant Disorder, Unspecified Mood Disorder, and Impulse Control Disorder; Other Axis II diagnosis included Personality Disorder Not Otherwise Specified and Cluster B Traits.

3.4 Differences between Attempters and Non-Attempters

Table 3.4 summarizes the demographic and clinical characteristics of attempters and non-attempters. Both attempters and non-attempters had fairly similar characteristics with regards to mean age, sexual orientation, marital status, mean education level, and mean GAF score. With regards to ethnicity, 71.7% of attempters and 52.5% of non-attempters were Caucasians. Fifty-five percent of the attempters were male whereas 75% of the non-attempters were male. Attempters were more likely to be given a diagnosis of Bipolar Disorder and Major Depressive Disorder compared to the non-attempters. Schizophrenia and Schizoaffective Disorder were more common in the non-attempters. Substance abuse was equally prevalent in both the groups. With regards to personality disorder diagnoses, Antisocial Personality Disorder was the most common diagnosis in both the groups. Attempters were more likely to be given a diagnosis of Borderline Personality Disorder compared to non-attempters. There was a trend for Narcissistic and Paranoid Personality Disorder diagnoses to be more common in the non-attempter group. The inpatient mean length of stay for the attempters was 122 days and for the non-attempters was 324 days.

Table 3.4: Comparison of Demographic and Clinical Characteristics of Attempters (N = 60) and Non-Attempters (N = 40)

<i>Variable</i>	<i>Attempters</i>	<i>Non-Attempters</i>
Mean Age	36.13	35.40
Gender (% Male)	55	75
Ethnicity (%)		
Caucasian	71.7	52.5
African American	20	42.5
Hispanic	6.7	0
Other	1.7	5
Marital Status (%)		
Single	73.3	72.5
Married	6.7	2.5
Divorced	16.7	15
Separated	3.3	10
Sexual Orientation (%)		
Heterosexual	95	100
Homosexual	5	0
Mean Years of Education	12.33	11.93
Axis I Diagnosis (%)		
Schizophrenia	13.3	32.5
Schizoaffective	23.3	20
Bipolar Disorder	21.7	12.5
Major Depressive	35	10
Psychotic Disorder NOS	3.3	22.5
Other	3.3	2.5
Substance Abuse (%)		
Present	81.7	82.5
Axis II Diagnosis (%)		
Antisocial	28.3	15
Narcissistic	0	2.5
Borderline	11.7	0
Paranoid	0	2.5
Other	8.3	5
None/Deferred	51.7	75
Mean GAF	37.4	36.83
Mean Days since Admission	121.9	324.38

Note. GAF = Global Assessment of Functioning; Other Axis I diagnosis included Oppositional Defiant Disorder, Unspecified Mood Disorder, and Impulse Control Disorder; Other Axis II diagnosis included Personality Disorder Not Otherwise Specified and Cluster B Traits.

3.5 Correlations between All Variables

Table 3.5 summarizes the correlations among all the variables. The self-report measures used in this study were found to be highly intercorrelated. With the exception of the correlations between Acquired Capability for Suicide Scale and Beck Depression Inventory ($r = -.005$) and Extrapunitive/Manipulative Reasons Subscale and other measures, there were weak to strong correlations between the self-report measures, indicating a certain degree of commonality of suicidal risk across the different measures. However, at least 41% ($.77 \times .77 = 59$) of the variance of each scale was accounted for by components that are unique to that scale.

Table 3.5: Intercorrelations for All Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. ACSS												
2. INT	.41**											
3. EXT	.08	.31**										
4. SI-IAT-A	-.07	-.08	-.17									
5. SI-IAT-I	-.04	.11	-.12	.25*								
6. BDI	-.005	.55**	.02	-.02	-.09							
7. BHS	.21*	.50**	.03	-.11	-.20	.64**						
8. BSS	.28**	.50**	-.02	.05	.05	.64**	.72**					
9. SAC	.32**	.36**	-.11	.04	-.03	.54**	.61**	.77**				
10. Ob	-.15	-.29**	-.03	-.14	-.01	-.40**	-.44**	-.54**	-.63**			
11. Number	.11	.07	.18	-.03	.02	.10	.13	.31**	.31**	.25*		
12. LSARS	.28**	.22*	.10	-.08	-.07	.24*	.24*	.32**	.24*	-.35**	.23*	

* $p < 0.05$, ** $p < 0.01$

Note. ACSS = Acquired Capability for Suicide Scale; INT = Internal Perturbations Based Reasons Subscale of the RASQ; EXT = Extrapunitive/Manipulative Reasons Subscale of the RASQ; SI-IAT-A = Attitude version of the Self-Injury Implicit Association Test (Cutting/No Cutting – Good/Bad); SI-IAT-I = Identity version of the Self-Injury Implicit Association Test (Cutting/No Cutting – Me/Not Me); BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; BSS = Beck Scale for Suicide Ideation; SAC = Suicide Assessment Checklist; Ob = Observation Level (1 = 1:1 observation, 2 = 15-minute observation, 3 = 30-minute suicide precaution observation, 4 = 30-minute routine observation); Number = Number of Suicide Attempts; LSARS = Lethality of Suicide Attempt Rating Scale
INT, EXT, Lethality ($N = 60$)

As predicted, ACSS was significantly positively correlated with the SAC ($r = .32$, $p < 0.01$). ACSS was also correlated positively with LSARS ($r = .28$, $p < .01$), in keeping with the interpersonal-psychological theory of suicidal behavior (Joiner, 2005). As predicted, ACSS was unrelated to BDI ($r = -.005$). In contrast to the expected trend, ACSS was significantly positively correlated with BSS ($r = .28$, $p < 0.01$). Correlation between ACSS and BSS was higher than those obtained by Van Orden et al. (2008) for a sample of 228 adult patients at an outpatient community mental health center (.14), and by Bender et al. (2007) (.09). Furthermore, in contrast to the expected trend, ACSS was not correlated significantly with observation level.

It is noteworthy that none of the predictors had statistically significant relationship with the number of attempts.

As predicted, the Internal Perturbations Based Reasons subscale of the RASQ was correlated with the SAC ($r = .36$, $p < 0.01$), observation level ($r = -.29$, $p < .01$), and lethality ($r = .22$, $p < 0.05$). INT was also positively correlated with BSS ($r = .50$, $p < 0.01$). Also, it is noteworthy that the INT, compared with the EXT, consistently exhibited stronger positive correlations with all other measures. Thus, as expected, compared with the EXT, the INT was a superior index of suicide risk.

All three Beck scales were correlated positively correlated with each other - BDI and the BHS ($r = .64$, $p < 0.01$), the BDI and the BSS ($r = .64$, $p < 0.01$), and the BHS and BSS ($r = .72$, $p < 0.01$).

Given that suicide ideation, clinician-judgment of suicide risk, observation level, and lethality are all important indicators of suicide risk, some degree of intercorrelations between these measures was expected. As shown in Table 6, all criterion variables

demonstrated associations with one another in the expected direction. In fact, the highest correlation in this matrix ($r = .77, p < 0.01$) was between SAC and BSS. Both of these variables also related positively to observation level, number of suicide attempts, and LSARS.

Furthermore, the attitude and identity versions of the SI-IAT were not correlated significantly with any of the self-report measures; however, this lack of correlations was not surprising given that implicit and explicit suicidality are two distinct concepts.

3.5.1 Recent Attempters

The correlation between LSARS and Observation Level among recent attempters ($N = 25$) was higher ($r = -.42, p < .05$) than the attempters ($r = -.35, p < .01$). In contrast to the pattern of associations in attempters, among the recent attempters, LSARS was not significantly related to BSS ($r = .22$) and SAC ($r = .06$).

3.6 Correlations between Age, GAF, Duration of Hospitalization, and Criterion Variables

The continuous demographic and clinical variables (age, GAF, duration of hospitalization) were investigated as correlates of the criterion variables. Age was not correlated with any of the criterion variables – BSS ($r = -.01$), SAC ($r = -.14$), Observation Level ($r = -.02$), and LSARS ($r = -.13$). Similarly, GAF demonstrated low and non-significant correlations with all the criterion measures – BSS ($r = -.13$), SAC ($r = -.14$), Observation Level ($r = -.13$), and LSARS ($r = .04$). Only observation level was found to be significantly associated with duration of hospitalization ($r = -.21, p < .05$). As the number of days of hospitalization increased, the observation level decreased.

However, duration of hospitalization did not correlate significantly with any of the other criterion variables - BSS ($r = -.09$), SAC ($r = -.17$), or LSARS ($r = .01$).

3.7 One-Way ANOVAs

To test the relationship between the categorical demographic and clinical variables of gender, marital status, ethnicity, axis I diagnosis, Axis II diagnosis, substance abuse, legal status, criminal charges, and the dependent variables of BSS, SAC, Observation Level, and LSARS, several one-way analysis of variances (ANOVA) were employed. The independent variables were different levels of gender (male and female), marital status (single, married, divorced, widowed, and separated), ethnicity (Caucasian, African American, Hispanic, Asian, and biracial), Axis I diagnosis (Schizophrenia, Schizoaffective Disorder, Bipolar Disorder, Major Depressive Disorder, Psychotic Disorder NOS, and other), Axis II diagnosis (Antisocial Personality Disorder, Borderline Personality Disorder, Narcissistic Personality Disorder, Paranoid Personality Disorder, and other), presence or absence of substance abuse, types of legal status (non-forensic, pre-trial forensic, or NGRI), and type of charge (felony vs. misdemeanor).

3.7.1 Beck Scale for Suicide Ideation

Table 3.6 summarizes the results of one-way ANOVA with BSS as the dependent variable. The results of the ANOVA indicated a significant relationship between Axis I Diagnosis and the total BSS score, $F(5, 94) = 3.02, p = .01$. The independent variable of Axis I diagnosis included diagnoses of Schizophrenia, Schizoaffective Disorder, Bipolar Disorder, Major Depressive Disorder, Psychotic Disorder NOS, and Other (Oppositional

Defiant Disorder, Unspecific Mood Disorder, and Impulse Control Disorder), while the dependent variable was the total score on the BSS. Levene's test indicated that the variances among the groups differed significantly, $F(5, 94) = 4.90, p = .001$. The variability was much greater for patients with a diagnosis of Major Depressive Disorder ($SD = 13.25$) than the other diagnostic groups. The Holm Multistage Bonferroni procedure was conducted to determine if the means of each group were significantly different from each other. It was found that the mean scores of patients diagnosed with Major Depressive Disorder ($M = 12.08, SD = 13.25$) were significantly different from the mean scores of patients diagnosed with Schizophrenia ($M = 2.71, SD = 4.46$). However, the mean scores of patients with diagnoses of Schizoaffective Disorder, Bipolar Disorder, Major Depressive Disorder, and Psychotic Disorder NOS were not significantly different from each other.

Table 3.6: Analysis of Variance for the Beck Scale for Suicide Ideation

<i>Source of Variation</i>	<i>Sum of Squares</i>	<i>DF</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig</i>
Gender	435.89	1	435.89	3.73	.06
Marital Status	151.77	3	50.59	.41	.74
Ethnicity	299.68	3	99.89	.83	.48
Axis I	1649.01	5	329.80	3.02	.01*
Axis II	166.48	2	83.24	.69	.51
Substance Abuse	164	1	164	1.37	.25
Legal Status	653.54	4	163.39	1.38	.25
Type of Charge	.68	1	.68	.02	.89

* $p < .05$, ** $p < .01$

3.7.2 Suicide Assessment Checklist

Table 3.7 summarizes the results of one-way ANOVA with SAC as the dependent variable. The results of the ANOVA indicated a significant relationship between legal status and the total score on the Suicide Assessment Checklist, $F(2, 96) = 6.05, p = .003$. The independent variable of legal status at admission included three groups – non-forensic patients, NGRI patients, and pre-trial forensic patients. Levene’s test indicated that the variances among the group differed significantly, $F(2, 96) = 12.42, p = .0001$. Post hoc comparisons using the Holm Multistage Bonferroni procedure indicated that the mean score of non-forensic patients ($M = 44.56, SD = 17.84$) was significantly different from the mean score of NGRI patients ($M = 33.43, SD = 9.96$) and pre-trial forensic patients ($M = 32.42, SD = 6.63$) with higher mean scores for non-forensic patients followed by NGRI patients, and lastly, pre-trial forensic patients. However, the mean scores of NGRI and pre-trial patients were not significantly different from each other. The results of the ANOVA suggested that there was no evidence that other demographic or clinical variables had a relationship to the score on the Suicide Assessment Checklist.

Table 3.7: Analysis of Variance for the Suicide Assessment Checklist

<i>Source of Variation</i>	<i>Sum of Squares</i>	<i>DF</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig</i>
Gender	107.50	1	107.50	.40	.53
Marital Status	516.75	3	172.25	.64	.59
Ethnicity	2013.03	3	671.01	2.65	.05*
Axis I	5097.85	7	728.26	3.16	.005**
Axis II	641.20	2	320.60	1.21	.30
Substance Abuse	206.08	1	206.08	.77	.38
Legal Status	2917.32	2	1458.66	6.05	.003**
Type of Charge	239.28	1	239.28	3.33	.08

* $p < .05$, ** $p < .01$

3.7.3 Observation Level

Table 3.8 summarizes the results of one-way ANOVA with observation level as the dependent variable.

The results of ANOVA also indicated a significant relationship between Axis I diagnosis and Observation Level, $F(5, 93) = 4.51, p = .001$. Using the Holm Multistage Bonferroni procedure, it was found that the mean observation level of patients with a diagnosis of Bipolar Disorder ($M = 2.72, SD = 1.13$) and Schizophrenia ($M = 3.81, SD = .52$), and Major Depressive Disorder ($M = 2.60, SD = 1.15$) and Schizophrenia ($M = 3.81, SD = .52$) were significantly different from each other. Patients with a diagnosis of Major Depressive Disorder and Bipolar Disorder were more likely to on higher levels of observation than patients with a diagnosis of Schizophrenia.

The results of the ANOVA indicated a significant relationship between legal status of the participant and the observation level, $F(2, 96) = 6.35, p = .003$. Levene's test indicated that the variances among the groups differed significantly, $F(2, 96) = 17.72, p < .0001$. The variability for patients with non-forensic status ($SD = 1.16$), NGRI patients ($SD = .86$), and pre-trial competency restoration patients ($SD = .45$) were significantly different from each other. Post hoc comparisons using the Holm Multistage Bonferroni indicated the mean observation level of non-forensic patients ($M = 2.89, SD = 1.16$) was significantly different from the mean observation level of NGRI ($M = 3.62, SD = .86$) and pretrial forensic patients ($M = 3.75, SD = .45$). However, the mean observation level of NGRI and pretrial forensic patients was not significantly different from each other.

Table 3.8: Analysis of Variance for Observation Level

<i>Source of Variation</i>	<i>Sum of Squares</i>	<i>DF</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig</i>
Gender	.773	1	.773	.64	.43
Marital Status	2.67	3	.89	.73	.53
Ethnicity	5.46	3	1.82	1.54	.21
Axis I	23.04	5	4.61	4.51	.001**
Axis II	3.09	2	1.55	1.29	.28
Substance Abuse	.16	1	.16	.13	.72
Legal Status	13.79	2	6.89	6.35	.003**
Type of Charge	.003	1	.003	.006	.94

* $p < .05$, ** $p < .01$

3.7.4 Lethality of Suicide Attempt Rating Scale

Table 3.9 summarizes the results of one-way ANOVA with lethality as the dependent variable. The results of the ANOVA indicated that the variables of gender, marital status, ethnicity, Axis I diagnosis, Axis II diagnosis, presence or absence of Substance Abuse, and Legal Status were unrelated to lethality.

Table 3.9: Analysis of Variance for Lethality of Suicide Attempt Rating Scale

<i>Source of Variation</i>	<i>Sum of Squares</i>	<i>DF</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig</i>
Gender	1.13	1	12.44	1.22	.27
Marital Status	1.91	3	.64	.06	.98
Ethnicity	21.83	3	7.28	.70	.56
Axis I	22.01	5	4.40	.41	.84
Axis II	9.32	2	4.66	.45	.64
Substance Abuse	.46	1	.46	.04	.84
Legal Status	58.80	2	29.40	3.06	.06
Type of Charge	NA	NA	NA	NA	NA

* $p < .05$, ** $p < .01$

Note. One-way ANOVA could not be computed for the variable Type of Legal Charge because there were fewer than two groups.

Overall, the results indicated that the demographic variables of gender, ethnicity, and marital status were unrelated to the dependent variables (SAC, BSS, Observation Level, and LSARS) and thus were not included in further analyses. Clinical variables - Axis II diagnosis and Substance Abuse - were also examined in relation to these dependent variables. These variables were not related to BSS, SAC, Observation Level, or LSARS and thus were not included in further analysis. Axis I Diagnosis and Legal Status were found have significant relationship and were included in the regression model.

3.8 Regression Analyses

A series of regression analyses were performed. A separate analysis was conducted for each of the two criterion measures (ACSS and INT). In each case, the criterion measure served as the dependent variable. The independent variables were entered into three hierarchical blocks. In these analyses, forced entry rather than stepwise entry was used to be congruent with a theory-driven approach. This entry of the variables was determined by the clinical conceptualization of suicide risk rather than statistical optimization. Consequently, the focus was on the extent to which the independent variable added to the predictive capacity rather than using statistical significance level to determine whether the scale entered the model.

3.8.1 Hierarchical Linear Regression Models

In the first series, regression analyses were performed to examine the role of ACSS over BDI and BHS in the prediction of the suicidal ideation scores as measured by the BSS.

Because patients with a diagnosis of Major Depressive Disorder ($M = 12.08$, $SD = 13.25$) demonstrated significantly greater suicide risk on the BSS than patients with a diagnosis of Schizophrenia ($M = 2.71$, $SD = 4.46$), Axis I diagnosis was entered on Step 1 of the regression analysis. To ensure that any relationship between acquired capability and suicidal ideation was independent of depression and hopelessness, BDI and BHS scores were entered on Step 2. The model was first tested for the problem of multicollinearity using variance inflation factors (VIF). None of the VIFs were greater than two, a finding indicative of the absence of the problem of multicollinearity. Furthermore, no condition indexes were greater than the critical value of 15, and no two variance proportions associated with any condition index were both greater than 0.50.

Axis I diagnosis explained approximately 6% of the variance in the BSS scores. With the addition of BDI and BHS in the second step, R^2 increased from .06 to .57 ($\Delta R^2 = .51$) and this increase was statistically significant ($F_{\text{chg}} = 57.64$, $p < .001$). With the addition of ACSS in the third step, R^2 increased from .57 to .61 ($\Delta R^2 = .04$) and this increase was statistically significant ($F_{\text{chg}} = 7.64$, $p < .05$). Thus, ACSS was found to have significant incremental predictive capacity over Axis I diagnosis, BDI, and BHS when suicidal ideation was the criterion. The results this hierarchical regression analyses are presented in Table 3.10. Figure 3.1 shows the scatter plot of BSS and ACSS. Also shown is the regression line for BSS regressed on ACSS.

Table 3.10: Summary of Hierarchical Linear Regression Analyses for Axis I Diagnosis, BDI, BHS, and ACSS Predicting Suicidal Ideation (N = 100)

Independent Variables	<i>B</i>	<i>SE</i>	β
<i>Step 1</i>			
Axis I Diagnosis	-.20	.54	-.03
<i>Step 2</i>			
BDI	.24	.06	.36
BHS	.81	.15	.46
<i>Step 3</i>			
ACSS	.13	.05	.19

Note. $R^2 = .06$ for Step 1 ($p < .05$); $R^2 = .57$ for Step 2 ($p < .001$); and $R^2 = .61$ for Step 3 ($p < .05$). Beta weights are shown for all variables only at the final step of the hierarchical model. Axis I Diagnosis = Schizophrenia, Schizoaffective Disorder, Bipolar Disorder, Major Depressive Disorder, Psychotic Disorder NOS, and other; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; ACSS = Acquired Capability for Suicide Scale.

Figure 3.1: Scatter plot with Fitted Linear Regression Line showing the Beck Scale for Suicide Ideation Scale as a function of the Acquired Capability for Suicide Scale

In the next model, BSS once again served as the dependent variable and the order of entry of Axis I diagnosis, BDI, and BHS was the same. However, INT comprised Block 3. These findings are illustrated in Table 3.11. None of the VIFs were greater than two thereby indicating the absence of the problem of multicollinearity. No condition indexes were greater than the critical value of 15, and no two variance proportions associated with any condition index were both greater than 0.50. Axis I diagnosis was entered in the first step and it explained approximately 10% of the variance in the BSS scores and thereby contributed significantly to the prediction of BSS. With the addition of

BDI and BHS in the second step, R^2 increased from .10 to .61 ($\Delta R^2 = .51$) and this increase was statistically significant ($F_{\text{chg}} = 36.28, p < .001$). The addition of INT in the third step did not cause an increase in R^2 ($F_{\text{chg}} = .46, p = .50$). Thus, INT was not found to have significant incremental predictive capacity over Axis I diagnosis, BDI, and BHS when suicidal ideation was the criterion. Figure 3.2 shows the scatter plot of BSS and INT, and the regression line for BSS regressed on INT.

Table 3.11: Summary of Hierarchical Linear Regression Analyses for Axis I Diagnosis, BDI, BHS, and INT Predicting Suicidal Ideation (N = 60)

Independent Variables	<i>B</i>	<i>SE</i>	β
<i>Step 1</i>			
Axis I Diagnosis	-.06	.94	-.006
<i>Step 2</i>			
BDI	.25	.09	.32
BHS	.92	.20	.51
<i>Step 3</i>			
INT	.14	.20	.07

Note. $R^2 = .10$ for Step 1 ($p < .05$); $R^2 = .61$ for Step 2 ($p < .001$); and $R^2 = .61$ for Step 3 ($p = .50$). Beta weights are shown for all variables only at the final step of the hierarchical model. Axis I Diagnosis = Schizophrenia, Schizoaffective Disorder, Bipolar Disorder, Major Depressive Disorder, Psychotic Disorder NOS, and other; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; INT = Internal Perturbation Based Reasons Subscale.

Figure 3.2: Scatter Plot with Fitted Linear Regression Line showing the Beck Scale for Suicide Ideation Scale as a Function of the Internal Perturbations Based Reasons Subscale

Next, hierarchical linear regression analysis was performed to determine which variables were most strongly predictive of clinical judgment of suicide risk as measured by the SAC. Thus, the SAC served as the dependent variable. Because nonforensic patients ($M = 44.56$, $SD = 17.84$) evidenced significantly greater suicidal risk on the SAC than the NGRI patients ($M = 33.43$, $SD = 9.96$) and pre-trial forensic patients ($M = 32.42$, $SD = 6.63$), legal status at admission was entered on Step 1 of the regression analysis. BDI and BHS comprised Block 2 to ensure that any relationship between acquired capability and clinician judgment of suicide risk was independent of depression

and hopelessness; and ACSS comprised Block 3. These findings are illustrated in Table 3.12.

The model was first tested for the problem of multicollinearity using VIF. None of the VIFs were greater than 1.84, a finding indicative of the absence of the problem of multicollinearity. Furthermore, no condition indexes were greater than the critical value of 15, and no two variance proportions associated with any condition index were both greater than 0.50. Thus, the model was free of multicollinearity.

Legal status at admission explained approximately 12% of variance in the SAC scores and thereby contributed significantly to the prediction of the SAC. With the addition of BDI and BHS in second step, R^2 increased from .12 to .45 ($\Delta R^2 = .33$) and this increase was statistically significant ($F_{\text{chg}} = 27.83, p < .001$). Thus, BDI and BHS were found to have significant incremental predictive capacity over legal status at admission when SAC was the criterion. In the next step, ACSS was entered into the equation and the R^2 increased from .45 to .49 ($\Delta R^2 = .04$) and this increase was statistically significant ($F_{\text{chg}} = 8.87, p < .05$). Figure 3.3 shows the scatter plot of SAC and ACSS. Also shown is the regression line for SAC regressed on ACSS.

Table 3.12: Summary of Hierarchical Linear Regression Analyses for Legal Status, BDI, BHS, and ACSS Predicting Clinician Judgment of Suicide Risk (N = 100)

Independent Variables	<i>B</i>	<i>SE</i>	β
<i>Step 1</i>			
Legal Status	-2.54	1.04	-.19
<i>Step 2</i>			
BDI	.28	.10	.28
BHS	.90	.26	.34
<i>Step 3</i>			
ACSS	.23	.08	.23

Note. $R^2 = .12$ for Step 1 ($p < .001$); $R^2 = .45$ for Step 2 ($p < .001$); and $R^2 = .49$ for Step 3 ($p < .05$). Beta weights are shown for all variables only at the final step of the hierarchical model. Legal Status = Non-Forensic, Forensic Pre-trial, and NGRI; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; ACSS = Acquired Capability for Suicide Scale.

Figure 3.3: Scatter Plot with Fitted Linear Regression Line showing the Suicide Assessment Checklist as a Function of the Acquired Capability for Suicide Scale

In the next model, SAC once again served as the dependent variable and the order of entry of Axis I diagnosis, BDI, and BHS was the same. However, INT comprised Block 3. These findings are illustrated in Table 3.13. None of the VIFs were greater than 1.78 thereby indicating the absence of the problem of multicollinearity. No condition indexes were greater than the critical value of 15, and no two variance proportions associated with any condition index were both greater than 0.50. Legal status at admission was entered in the first step and it explained approximately 13% of the variance in the SAC scores and thereby contributed significantly to the prediction of

SAC. With the addition of BDI and BHS in the second step, R^2 increased from .13 to .45 ($\Delta R^2 = .32$) and this increase was statistically significant ($F_{\text{chg}} = 15.58, p < .001$). The addition of INT in the third step did not cause an increase in R^2 ($F_{\text{chg}} = .02, p = .88$). Thus, INT was not found to have significant incremental predictive capacity over Legal Status, BDI, and BHS, when SAC was the criterion. Figure 3.4 shows the scatter plot of SAC and INT, and the regression line for SAC regressed on INT.

Table 3.13: Summary of Hierarchical Linear Regression Analyses for Legal Status, BDI, BHS, and INT predicting Clinician Judgment of Suicide Risk (N = 60)

Independent Variables	<i>B</i>	<i>SE</i>	β
<i>Step 1</i>			
Legal Status	-3.26	1.60	-.21
<i>Step 2</i>			
BDI	.16	.15	.15
BHS	1.14	.32	.47
<i>Step 3</i>			
INT	.05	.32	.02

Note. $R^2 = .13$ for Step 1 ($p < .001$); $R^2 = .45$ for Step 2 ($p < .001$); and $R^2 = .45$ for Step 3 ($p = .88$). Beta weights are shown for all variables only at the final step of the hierarchical model. Legal Status = Non-Forensic, Forensic Pre-trial, NGRI; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; INT = Internal Perturbations-Based Reasons Subscale.

Figure 3.4: Scatter Plot with Fitted Linear Regression Line showing the Suicide Assessment Checklist as a Function of the Internal Perturbations Based Reasons Subscale

The only significant correlate of LSARS was ACSS; hence, a regression analysis was not conducted. Figure 3.5 shows the regression line for LSARS regressed on ACSS.

Figure 3.5: Scatter Plot with Fitted Linear Regression Line showing the Lethality of Suicide Attempt Rating Scale as a Function of the Acquired Capability for Suicide Scale

In summary, these results of the regression analyses indicated significant predictive capacity of ACSS incrementally over Axis I diagnosis, BDI, and BHS in predicting suicidal ideation as measured by BSS. The results also revealed significant predictive capacity of ACSS over legal status, BDI, and BHS in predicting clinician judgment of suicide risk as measured by SAC. With regards to lethality of suicide attempts, ACSS was found to be the only significant correlate. Contradictory to the initial hypothesis that regression analyses would reveal unique contributions of internal perturbation based reasons to clinician judgment of suicide risk, internal perturbation

based reasons did not account for a significant increment in variance in suicidal risk in the regression models.

3.8.2 Multinomial Logistic Regression Models

Multinomial logistic regression analysis with observation level as the dependent variable was used as a multivariate approach to predict level of observation. In the first model, Axis I Diagnosis, Legal Status, Duration of Hospitalization, BDI, BHS, and ACSS were used as predictors (independent variables). Table 3.14 shows the multinomial logistic regression analyses performed to examine the relative utility of these variables for predicting whether the patient was placed on 1:1, 15-minute, 30-minute suicide precaution, or 30-minute routine observation. The statistic for the model ($\chi^2 = 236.35$; $df = 279$; $p = .97$; Nagelkerke $R^2 = .44$) indicated that the model did not fit very well to data. This is also demonstrated by the fact that the model predicted 1:1 observation level with 30 % accuracy, 15-minute observation level with 47.8% accuracy, 30-minute suicide precaution observation with 11.1% accuracy, and 30-minute routine observation with 91.4% accuracy, with an overall accuracy of 68%. Of the six independent variables, only BHS was a significant predictor of 1:1 observation level.

Table 3.14: Summary of Multinomial Logistic Regression Analysis of Axis I Diagnosis, Legal Status, Duration of Hospitalization, BDI, BHS, and ACSS Distinguishing Patients at 1:1 (N = 10), 15-minute (N = 22), 30-minute Suicide Precaution (N = 9), and 30-minute Routine Observation (N = 57)

	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>Sig.</i>	<i>Exp(B)</i>	<i>95% C.I.</i>	
1:1							
Axis I	-.03	.38	.01	.94	.97	.46	2.06
Legal	-.78	1.13	.45	.50	.47	.05	4.33
Duration	-.01	.01	.22	.64	.99	.97	1.02
BDI	.04	.03	1.45	.23	1.04	.98	1.11
BHS	.17	.08	4.37	.04*	1.19	1.01	1.39
ACSS	-.01	.03	.32	.57	.99	.94	1.04
15-minute							
Axis I	.38	.23	2.68	.10	1.46	.93	2.30
Legal	-1.75	.91	3.69	.06	.18	.03	1.04
Duration	.00	.00	.14	.71	1.00	.99	1.00
BDI	.01	.02	.20	.66	1.01	.97	1.06
BHS	.04	.06	.36	.55	1.04	.92	1.17
ACSS	.03	.02	2.16	.14	1.03	.99	1.07
30-minute							
Axis I	.33	.27	1.51	.22	1.39	.82	2.36
Legal	.60	.45	1.75	.19	1.82	.75	4.39
Duration	-.01	.01	1.19	.28	.99	.98	1.01
BDI	.01	.03	.16	.69	.99	.93	1.05
BHS	.02	.09	.05	.83	1.02	.86	1.21
ACSS	-.03	.02	1.27	.26	.97	.93	1.02

* $p < .05$, ** $p < .01$

Note. Axis I = Axis I Diagnosis; Legal = Non-forensic, Pre-trial Forensic, or Not Guilty by Reason of Insanity; Duration = Duration of Hospitalization in days; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; ACSS = Acquired Capability for Suicide Scale; Reference category: 30-minute routine observation

Table 3.15 shows the multinomial logistic regression analyses performed to examine the relative utility of Axis I Diagnosis, Legal Status, Duration of Hospitalization, BDI, BHS, and INT for predicting whether the patient placed on 1:1, 15-minute, 30-minute suicide precaution, or 30-minute routine observation. The statistic for

the model ($\chi^2 = 151.36$; $df = 159$; $p = .66$; Nagelkerke $R^2 = .53$) indicated that the model did not fit very well to data. This is also demonstrated by the fact that the model predicted 1:1 observation level with 20 % accuracy, 15-minute observation level with 60 % accuracy, 30-minute suicide precaution observation with 20 % accuracy, and 30-minute routine observation with 76 % accuracy, with an overall accuracy of 56.7%. Of the six independent variables, only Axis I Diagnosis was a significant predictor of 15-minute observation level.

Table 3.15: Summary of Multinomial Logistic Regression Analysis of Axis I Diagnosis, Legal Status, Duration of Hospitalization, BDI, BHS, and INT Distinguishing Patients at 1:1 (N = 10), 15-minute (N = 20), 30-minute Suicide Precaution (N = 5), and 30-minute Routine Observation (N = 25)

	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>Sig.</i>	<i>Exp(B)</i>	<i>95% C.I.</i>	
1:1							
Axis I	.28	.48	.33	.57	1.32	.51	3.40
Legal	-.90	1.23	.53	.47	.41	.04	4.55
Duration	-.01	.01	.19	.66	1.00	.97	1.02
BDI	.05	.04	.13	.72	1.02	.94	1.10
BHS	.16	.08	3.48	.06	1.17	.99	1.38
INT	.01	.10	.02	.90	1.01	.84	1.23
15-minute							
Axis I	.91	.43	4.53	.03*	2.47	1.08	5.69
Legal	-2.16	1.34	2.57	.11	.12	.01	1.62
Duration	.001	.001	1.09	.30	1.00	.99	1.00
BDI	-.03	.03	.55	.46	.98	.91	1.04
BHS	.09	.07	1.63	.20	1.09	.95	1.26
INT	.05	.08	.42	.52	1.05	.90	1.22
30-minute							
Axis I	1.05	.59	3.12	.08	2.86	.89	9.15
Legal	1.16	.94	1.52	.22	3.18	.51	19.93
Duration	-.02	.03	.62	.43	.98	.92	1.04
BDI	-.004	.05	.004	.95	1.00	.90	1.12
BHS	.03	.13	.05	.82	1.03	.80	1.33
INT	-.10	.09	1.35	.25	.90	.76	1.07

* $p < .05$, ** $p < .01$

Note. Axis I = Axis I Diagnosis; Legal = Non-forensic, Pre-trial Forensic, or Not Guilty by Reason of Insanity; Duration = Duration of Hospitalization in days; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; INT = Internal Perturbations-Based Reasons subscale; Reference category: 30-minute routine observation

3.9 T-Tests

3.9.1 Attempters versus Non-Attempters

3.9.1.1 Attitude Version of the Self-Injury Implicit Association Test

An independent samples t-test was conducted to determine if attempters and non-attempters showed different associations on the Attitude version of the SI-IAT. The mean score for attempters ($M = -.56$, $SD = .34$) was not significantly different from the mean score of non-attempters ($M = -.49$, $SD = .38$), $t(96) = .93$, $p = .35$. These data are presented in Table 3.16. Although the sizes of the two groups were imbalanced (58 attempters, 40 non-attempters), the Levene's test was not significant, $F = .19$, $p = .66$. The 95% confidence interval for the difference in means between attempters and non-attempters was $-.08$ to $.21$, thus including the expected value of 0 and thereby indicating that the difference was not statistically significant. Therefore, there was no statistically significant difference on the Attitude version of the SI-IAT between attempters and non-attempters. The histograms (Figure 3.6) show a similar distribution for the standardized D score for the Attitude version of the SI-IAT for attempters and non-attempters. The distribution is positively skewed for both the groups thereby indicating that most individuals in the two groups associated "Cutting" with "Bad."

Table 3.16: Summary of T-Tests for the Attitude and Identity Versions of the Self-Injury Implicit Association Test for Attempters ($N = 58$) and Non-Attempters ($N = 40$)

	<i>Attempters</i>	<i>Non-Attempters</i>	<i>t</i>	<i>df</i>
Attitude	-.56 (.34)	-.49 (.38)	.93	96
Identity	-.30 (.44)	-.29 (.36)	.11	96

* $p < .05$, ** $p < .01$

Note. Standard deviations appear in parentheses below means.

Figure 3.6: Comparison of Performance of Attempters ($N = 58$) and Non-Attempters ($N = 40$) on the Attitude Version of the Self-Injury Implicit Association Test

Note. Negative or positive values indicate the direction of the association (negative = *Cutting/Bad*, positive = *Cutting/Good*)

3.9.1.2 Identity Version of the Self-Injury Implicit Association Test

An independent samples t-test was conducted to determine if attempters showed a stronger association between “*Cutting*” and “*Me*” than non-attempters. The mean score for attempters ($M = -.30, SD = .44$) was not significantly different from the mean score of non-attempters ($M = -.29, SD = .36$), $t(96) = .11, p = .91$. These data are summarized in Table 3.16. Although the sizes of the two groups were imbalanced (58 attempters, 40 non-attempters), the Levene’s test was not significant, $F = .357, p = .06$. The 95% confidence interval for the difference in means between attempters and non-attempters was $-.16$ to $.17$ which contains the expected value of 0 thereby indicating that the sample statistic belongs to the null distribution. Therefore, there was no statistically significant difference on the identity version of the SI-IAT between attempters and non-attempters. The histograms (Figure 3.7) show a positively skewed distribution for attempters and non-attempters thereby indicating that most individuals in these two groups associated “*Cutting*” with “*Not Me*.”

Figure 3.7: Comparison of Performance of Attempters (N = 58) and Non-Attempters (N = 40) on the Identity Version of the Self-Injury Implicit Association Test

Note. Negative values indicate association between *Cutting/Not Me* and positive values indicate association between *Cutting/Me*.

3.9.2 Cutters vs. Non-Cutters

3.9.2.1 Attitude Version of the Self-Injury Implicit Association Test

An independent samples t-test was conducted to determine if cutters and non-cutters showed different associations on the Attitude version of the SI-IAT. The mean score for cutters ($M = -.65$, $SD = .38$) was not significantly different from the mean score of non-

cutters ($M = -.51$, $SD = .35$), $t(96) = 1.40$, $p = .17$. These data are presented in Table 3.17. Although the sizes of the two groups were imbalanced (14 cutters, 84 non-cutters), the Levene's test was not significant, $F = .28$, $p = .60$. The 95% confidence interval for the difference in means between cutters and non-cutters was $-.06$ to $.34$, thus including the expected value of 0 and thereby indicating that the difference was not statistically significant. Therefore, there was no statistically significant difference on the Attitude version of the SI-IAT between cutters and non-cutters. The histograms (Figure 3.8) show a similar distribution for the standardized D score for the Attitude version of the SI-IAT for cutters and non-cutters. The distribution is positively skewed for both the groups thereby indicating that that most individuals in the two groups associated “Cutting” with “Bad.”

Table 3.17: Summary of T-Tests for the Attitude and Identity Versions of the Self-Injury Implicit Association Test for Cutters ($N = 14$) and Non-Cutters ($N = 84$)

	<i>Cutters</i>	<i>Non-Cutters</i>	<i>t</i>	<i>df</i>
Attitude	-.65 (.38)	-.51 (.35)	1.40	96
Identity	-.21 (.42)	-.31 (.41)	.79	96

* $p < .05$, ** $p < .01$

Note. Standard deviations appear in parentheses below means.

Figure 3.8: Comparison of Performance of Cutters (N = 14) and Non-Cutters (N = 84) on the Attitude Version of the Self-Injury Implicit Association Test

Note. Negative or positive values indicate the direction of the association (negative = *Cutting/Bad*, positive = *Cutting/Good*)

3.9.2.2 Identity Version of the Self-Injury Implicit Association Test

An independent samples t-test was conducted to determine if cutters showed a stronger association between “*Cutting*” and “*Me*” than non-cutters. The mean score for cutters ($M = -.21$, $SD = .42$) was not significantly different from the mean score of non-cutters ($M = -.31$, $SD = .41$), $t(96) = .79$ $p = .43$. These data are summarized in Table 3.17. Although the sizes of the two groups were imbalanced (14 cutters, 84 non-cutters), the Levene’s

test was not significant, $F = .10, p = .75$. The 95% confidence interval for the difference in means between attempters and non-attempters was $-.33$ to $.14$ which contains the expected value of 0 thereby indicating that the sample statistic belongs to the null distribution. Therefore, there was no statistically significant difference on the identity version of the SI-IAT between cutters and non-cutters. The histograms (Figure 3.9) show a positively skewed distribution for cutters and non-cutters thereby indicating that most individuals in these two groups associated “Cutting” with “Not Me.”

Figure 3.9: Comparison of Performance of Cutters (N = 14) and Non-Cutters (N = 84) on the Identity Version of the Self-Injury Implicit Association Test

Note. Negative or positive values indicate the direction of the association (negative = Cutting/Not Me, positive = Cutting/Me)

Chapter 4

Discussion

The current study is the first to evaluate the role of acquired capability, reasons for attempting suicide, implicit identification with self-injury, and implicit attitude towards self-injury in forensic and non-forensic patients in an inpatient psychiatric setting. This sample and setting were selected to address one of the biggest challenges facing clinicians and researchers in the field of suicide risk assessment - low base rate occurrence of suicidality. A history of attempted suicide was very common in this sample.

This study built on previous investigations, which have typically been restricted to only one or two classes of criterion and predictor variables. A comprehensive model was examined which included predictors of acquired capability for suicide, reasons for attempting suicide (internal perturbation based reasons vs. extrapunitive/manipulative reasons), depression, hopelessness, Axis I diagnosis (Schizophrenia, Schizoaffective Disorder, Bipolar Disorder, Major Depressive Disorder, and Psychotic Disorder NOS), legal status (non-forensic, forensic pre-trial, and NGRI), and duration of hospitalization. The model examined the predictors that correlated significantly with suicide risk as measured by suicide ideation, clinician judgment of suicide risk, observation level, and

lethality. These four distinct categories of suicide risk criterion variables were utilized to reflect the multidimensional conceptualization of suicide wherein ideation, attempts, and completions are distinct phenomena (Holden & Kroner, 2003). This study also examined the implicit identification with self-injury and implicit attitude towards self-injury of attempters and non-attempters.

The principal hypotheses concerned the relations between the different risk factors (acquired capability, reasons for attempting suicide, depression, and hopelessness) on one hand and suicidal risk (self-reported suicidal ideation, clinician judgment, observation level, and lethality) on the other. It was expected that depression and hopelessness would be related to higher levels of suicidal ideation, whereas acquired capability and internal perturbations based reasons, would be related to higher levels of clinician judgment of suicide risk, observation level, and lethality. These hypotheses were generated based on the theoretical explanation that acquired capability and internal perturbation based reasons might be of greater relative importance than hopelessness and depression for predicting more behavioral suicide manifestations like clinician judgment, observation level, and lethality.

4.1 Clinical Variables

Some clinical variables (affective disorders, non-forensic status, and duration of hospitalization) were associated with increased suicide risk on the criterion variables.

4.1.1 Affective Disorders

Patients diagnosed with Major Depressive Disorder had significantly higher scores on the Beck Scale for Suicide Ideation than patients diagnosed with Schizophrenia.

Furthermore, patients diagnosed with Major Depressive Disorder and Bipolar Disorder were significantly more likely to be placed on higher levels of observation than patients diagnosed with Schizophrenia. The association between affective disorders and suicide risk is strong and consistent across several research studies (Combs & Romm, 2007; Dutta et al., 2007; Fawcett et al., 1987; Persson, et al., 1999; Tsai et al., 1999). However, it is important to note that the majority of the patients described as experiencing command hallucinations to engage in self-harm or suicide were placed on 1:1 or 15-minute suicide risk observation although they did not report desire to make a suicide attempt. This is because although suicidal desire was absent, the potential for command-driven self-harm was high.

4.1.2 Non-Forensic vs. Forensic Status

Non-forensic patients had significantly higher scores on the Suicide Assessment Checklist than the NGRI or pre-trial forensic patients. Additionally, non-forensic patients were significantly more likely to be placed on higher levels of observation than the NGRI or pre-trial forensic patients. Other comparisons of these three groups revealed that non-forensic patients were more likely to have been recently hospitalized, diagnosed with affective disorders, and acutely ill (as reflected by the GAF) than NGRI or pre-trial forensic patients. This constellation of findings suggests that while non-forensic status

may not induce higher risk per se, affective disorders and acute symptoms may account for the link between non-forensic status and elevated suicide risk.

4.1.3 Duration of Hospitalization

As would be expected, newly admitted patients were significantly more likely to be placed on higher levels of observation than patients who had been hospitalized for longer durations.

4.2 Acquired Capability for Suicide

It was hypothesized that acquired capability would be positively associated with clinician judgment of suicide risk, observation level, and particularly lethality, but would be unrelated to depression and suicide ideation. Consistent with this hypothesis, acquired capability was significantly associated with clinician judgment of suicide risk and lethality; however, acquired capability was unrelated to observation level. An important caveat in interpreting this lack of correspondence between acquired capability and observation level relates to the issue of recording of data in the present study. Only observation level from four weeks prior to the survey date was incorporated into the study.

Also as predicted, acquired capability was unrelated to depression thereby indicating that acquired capability for suicide diverges from depression. Thus, acquired capability and depression are two different constructs. Based on previous research (Van Orden et al., 2008), it was also hypothesized that acquired capability would be unrelated to suicide ideation. However, in contrast to the expected trend of lack of correlations

between acquired capability and suicide ideation, the correlation between these variables was statistically significant. The correlation between acquired capability and suicide ideation in the present study was higher than that obtained in other studies (Bender et al., 2007; Van Orden et al., 2008). This result is surprising given that acquired capability has been conceptualized as distinct from current suicidal ideation. Current suicidal ideation may *temporarily* elevate fearlessness about lethal self-injury. This elevation in fearlessness may be due to aversive thoughts and emotions and accompanying physiological arousal associated with suicide ideation. A direct assessment is needed, however, regarding the relation between acquired capability and suicide ideation.

Apart from the hypothesized correlations, the most notable correlations of acquired capability were internal perturbation based reasons, hopelessness, and clinical judgment of suicide risk.

With regards to regression analyses, in line with previous research (Van Orden et al., 2008), acquired capability for suicide was a significant predictor of lethality. It is important to note that depression and hopelessness were unrelated to lethality. As predicted, results indicated that acquired capability for suicide accounted for significant portions of unique variance in suicide ideation, clinically judged suicide risk, and lethality. More importantly, acquired capability demonstrated significant incremental predictive capacity over depression and hopelessness in the prediction of suicide ideation, clinician judgment of suicide risk, and lethality. The results of the present study indicate that acquired capability for suicide has considerable importance for understanding suicidal risk, even when depression and hopelessness have been taken into consideration. Therefore, the important finding is that whether or not suicidal risk is defined by suicidal

ideation (BSS), clinical judgment of suicide risk (SAC), or lethality (Scale Points for Lethality Assessment), acquired capability was an important predictor.

4.3 Internal Perturbation Based Reasons

It was hypothesized that internal perturbation based reasons as measured by the RASQ would be strongly positively associated with clinical judgment of suicide risk, observation level, and lethality. As predicted, internal perturbation based reasons were significantly associated with clinician judgment of suicide risk, observation level, and lethality thereby indicating that internal perturbations based reasons are important for understanding more behavioral suicide manifestations. The link between internal perturbation based reasons and suicide risk may be attributable jointly to unbearable psychological pain and perception of suicide as a solution to cease the pain. When the inner world is characterized by unbearable emotional pain, individuals are likely to be motivated to escape this pain through actions, including suicidal actions. Indeed this relationship has been supported by previous research studies (Holden, et al., 1998; Holden & Kroner, 2003; Johns & Holden, 1996; McAuliffe, et al., 2007). Furthermore, although internal perturbation based reasons were significantly correlated with extrapunitive/manipulative motivations, the latter were unrelated to suicide risk.

In addition to the hypothesized correlations, internal perturbation based reasons were related to depression, hopelessness, and suicidal ideation. This result is not surprising given that the BDI, BSS, BHS, and INT of RASQ all consist of items that tap into self-defeating cognitions.

Contradictory to the initial hypothesis that regression analyses would reveal unique contributions of internal perturbation based reasons to clinician judgment of suicide risk, observation level, and lethality, internal perturbation based reasons did not account for a significant increment in variance in suicidal risk in the regression models. An important caveat in interpreting this finding relates to the issue of sample size. RASQ scores of only patients with documented suicide attempts ($N = 60$) were incorporated in the analyses. This small size sample is likely to have caused lack of statistical power and the nil findings are likely to be due to statistical type II errors. A second possible explanation may involve the use of forced entry rather than stepwise entry in this study. With internal perturbation based reasons being the final variable entered, the predictive power of internal perturbation based reasons may have been underestimated.

4.4 Implicit Attitude/Implicit Identity

The absence of an association between the implicit and explicit measures of suicide risk warrants discussion. Given the distinct nature of explicit and implicit mental representations, low correlations are expected (Gschwender, 2008; Steiger, Gortiz, & Burger, 2010). Previous research has shown that the correlations between implicit and explicit measures depend on the psychological attribute being examined (Hofmann, Gawronski, Gschwendener, Le, & Schmitt, 2005) and structural fit between the implicit and explicit measures (Payne et al., 2008). Egloff and Schmukle (2004) argue that low correlations between the implicit and explicit measures are not likely to be the result of methodological issues because both implicit and explicit measures usually show a good distribution and adequate reliability.

It was hypothesized that attempters would show a stronger positive association between “*Cutting*” and “*Me*,” and “*Cutting*” and “*Good*,” whereas non-attempters would show a stronger positive association between “*Cutting*” and “*Not Me*,” and “*Cutting*” and “*Bad*.” However, most patients in the present sample demonstrated lack of identification with self-injury and demonstrated unfavorable attitude towards self-harm. This pattern of associations is consistent with prior research on the SI-IAT (Nock & Banaji, 2007a).

In previous research, non-suicidal individuals, ideators, and attempters have been found to significantly differ in terms of the association between self-injury and oneself (Nock & Banaji, 2007b). In the present study, neither implicit identity nor implicit attitude distinguished between attempters and non-attempters and this pattern of results was not consistent with expected findings. Nock and Banaji (2007b) suggest that images of skin cutting unambiguously represent the construct of self-injury. In their investigation, images of skin cutting predicted suicide criteria beyond the relation of these images to non-suicidal self-injury. However, all the suicide attempters in their study had a history of non-suicidal self-injury and most of these attempters had engaged in cutting. On the contrary, the majority of patients in the present study had used overdose/poisoning as a method of attempting suicide. It is possible that the differences in the nature of suicide attempts accounted for this unexpected finding. Given that the majority of patients in the present sample had used methods other than cutting, images of cutting may not have tapped into the associations between self-injury and oneself. Furthermore, the relationship between self-harm and suicide is complicated.

Another possible explanation for the failure of the implicit measures to predict attempter and non-attempter status is the prevalence of *recent* suicidality in the present

sample. Although suicidality was very common in the present sample, only 18 patients had *recently* attempted suicide. In fact, the majority of patients had attempted suicide in the 6-month to 10-year period prior to the survey date. This is a particularly important consideration because IATs have been hypothesized to predict actual behavior only when the behavior results from *recurrent* impulsive behavioral activation (Back, Schmukle, & Egloff, 2009). According to the Behavioral Process Model of Personality (BPMP; Strack & Deutsch, 2004), indirect tests like Thematic Apperception Test and IAT assess impulsive processes wherein automatic processing of situational cues and automatic actions create associative representations of the self (e.g., “*Me*” – “*Cutting*”). Back et al. (2009) argue that the strength of these associations depends on the frequency of the behavior - “The more often an individual executes such a course of action, the stronger her/his association between the self and the respective trait concept will be” (p. 534). In the present study, a relatively low number of patients had *recently* attempted suicide and this may have made the impulsive processes tapped by the IATs less pronounced in the present sample. Perhaps this result may be counteracted by studying a large sample of suicidal individuals with recent attempts.

4.5 Criterion Variables

4.5.1 Suicide Ideation

There was considerable variance in suicidal ideation in this sample. Consistent with previous research (Brown et al, 2000; Van Heeringen et al., 2003; Williams & Pollock, 2001), suicide ideation was the most significantly correlated with hopelessness in this sample. Individuals, who are feeling hopeless, understandably experience suicidal

ideation because they believe that their condition will never improve and that there is no solution to problems. Thus, hopelessness makes suicide seem better than living. In contrast, individuals with low levels of hopelessness are optimistic about the future and are motivated, and, therefore, may be less likely to experience suicidal ideation.

4.5.2 Clinician Judgment of Suicide Risk

Clinician judgment of suicide risk is an important variable to consider because treatment decisions, particularly in inpatient settings, are directly dependent on the clinician's formulation of suicide risk. Joint Commission requires documented suicide risk assessment for all patients in inpatient settings (Giordano & Stichler, 2009). Moreover, clinical formulation of suicide risk decreases potential liability if suicide occurs. In the present study, clinician judgment of suicide risk as measured by the SAC was most significantly associated with the criterion measure of suicide ideation, followed by the predictor variables of depression, hopelessness, internal perturbation based reasons, and acquired capability for suicide. Thus, clinical formulation of suicide risk most heavily relies on suicidal ideation, depression, and hopelessness.

4.5.3 Observation Level

In this study, of those variables found to be significantly related to observation level, clinician judgment of suicide risk was found to account for most of the variance in observation level, followed by suicide ideation, depression, hopelessness, and internal perturbation based reasons. This finding highlights the importance of clinician judgment of suicide risk on treatment planning. Thus, a close monitoring level was associated with

higher suicide risk as determined by the clinician. In regression analyses, hopelessness was the only significant predictor of constant observation and Axis I diagnosis was the only significant predictor of 15-minute observation.

4.5.4 Lethality

Of the predictor variables, acquired capability for suicide, internal perturbation based reasons, depression, and hopelessness were found to be significantly associated with lethality. Furthermore, all the criterion variables were significantly associated with lethality – suicide ideation, clinician judgment of suicide risk, and observation level.

4.6 Summary

This study highlights the factors associated with suicide risk among forensic and non-forensic inpatients. Overall, then, these findings are consistent with past research pointing to the role of acquired capability and internal perturbation based reasons in elevating suicidal risk. Nevertheless, these findings build on this previous research by combining these variables in a single, comprehensive model. Thus, a less inclusive model that did not incorporate these variables would have had a weaker association with the criterion measures. Results also revealed that acquired capability accounted for unique variance in the criterion measures and thereby represented a unique predictor of suicide risk. Taken together, these findings provide support for the constructs of acquired capability for suicide proposed by Joiner (2005) and reasons for attempting suicide by Holden et al. (1998).

4.7 Implications

The current study enhances our understanding of suicidality. The results of the present study indicate that acquired capability and reasons for attempting suicide have considerable importance for understanding suicide risk. Integration of acquired capability for suicide and reasons for attempting suicide into assessment and treatment is warranted.

The results of the present study carry some potentially important treatment implications. As such, treatment of internal perturbation based reasons may be an important target for the treatment of suicidal individuals. Internal perturbation based reasons could be directly addressed as part of intervention programs. It would be beneficial to provide psychotherapy that may address these reasons and eventually protect these individuals from attempting suicide. For example, cognitive-behavioral treatment teaches patients to recognize distortions in thinking and consciously try to combat them by using more adaptive self-talk. Dialectical behavioral therapy requires patients to accept themselves and change destructive coping methods. It would be interesting to study whether internal perturbation based reasons can indeed be changed by treatment. However, it is important to consider that even when suicidal behaviors are a result of extrapunitive/manipulative reasons, they strongly affect interpersonal relationships (Scocco, Girolamo, Vilagut, & Alonso, 2008).

In terms of assessment, the results of this study support continuing emphasis given to the role of depression and hopelessness in the prediction of suicide risk in a clinical sample. Furthermore, strategies to assess and improve suicidal risk may require that clinicians ask about and address symptoms beyond those generally associated with suicide risk. Clinicians working with suicidal individuals should assess variables of

acquired capability and internal perturbation based reasons, Axis I diagnosis, duration of hospitalization, and forensic vs. non-forensic status in addition to depression and hopelessness, to determine which ones appear most salient in individual patients.

Lethality is a particularly advantageous construct because it has been identified as linked to more severe forms of suicide outcomes because of its inverse relationship with help-seeking communications (Barnes, Ikeda, & Kresnow, 2001; Handwerk et al., 1998), and positive relationship with suicide intent (Nasser & Overholser, 1999) and completed suicides (Hawton, 2001; Pallis & Barraclough, 1977). Several factors that are related to suicide risk seem to be amenable to intervention. The present study indicates that internal perturbations based reasons might be a candidate for such intervention programs.

From a practical point of view, the ACSS, RASQ, and IATs are brief and easy to administer. However, the IATs may be difficult for some patients to use, especially those who are unable to use a computer.

4.8 Limitations

The findings of the present study should be interpreted in the context of several important limitations. First, psychotropic medications could have influenced performance on the IATs; however, medication information was not recorded for the patients. The potential of medications on suppressing suicidality cannot be dismissed. Although the investigation of the effect of psychotropic drugs on this measure was not the primary aim of our study, the influence of drug treatment is a relevant issue that deserves further investigation. Second, some patients who were severely ill because of psychiatric symptoms were unable to complete the IATs and the self-report measures, which could

have biased sample selection. Third, there was considerable discrepancy between self-reported information and information obtained from chart review with regards to the presence of history of suicide attempt. Some patients may have been concerned about reporting suicidal ideation and/or suicidal plans on the self-report measures to avoid loss of privileges or delay of discharge. Furthermore, there was no control with regard to the conditions of original recording of the data in patients' charts. Fourth, although the importance of studying "actual" behavior has long been recognized (Baumeister, Vohs, & Funder, 2007), in the present study, suicidal risk was operationalized using the construct of observation level. Observation level was significantly associated with clinician judgment of suicide risk and it is possible that observation level and suicidal behavior differ in important ways. Thus, recording observation level as an indication of suicidal risk would omit important and significant contributors to actual suicidal behaviors. Fifth, patients were not followed after the survey date. This is an important limitation since suicide risk has been demonstrated to exacerbate in the initial two weeks following discharge (Appleby, et al., 1999; Geddes, Juszczak, O'Brien, & Kendrick, 1997; Goldacre et al., 1993; Ismetsa et al., 1994; Qin & Nordentoft, 2005). Sixth, interrater reliability data were not available for the variables of clinician judgment of suicide risk and lethality. As stated above, SAC and LSARS scores were determined based on the data gathered from patient's medical records. Variability existed in the extent to which information about suicide attempts was documented. Thus, this method of scoring LSARS could have underestimated or overestimated the lethality of an attempt. Seventh, reliability of self-report information warrants discussion. Previous research on the reliability of self-reported information within populations with psychosis has been mixed.

has shown that self-reported information within populations with psychosis of psychotic and depressive symptoms correlated well with observer rating scales; however, others found that self-reported psychopathology significantly correlated with subjective quality-of-life scores but not observer-rated psychopathology (Addington, Addington, & Maticka-Tyndale, 1993; Lasalvia, Ruggeri, & Santolini, 2002; Liraud, Droulout, Parrot, & Verdoux, 2004). Eighth, there was considerable heterogeneity in the sample with regards to the duration of hospitalization (range = 1 to 3391 days) wherein some patients were more fluid in suicide risk. Ninth, suicidal behavior was remote relative to the time of the survey date for the majority of attempters. Low correlations may be attributed in part to the temporal differences in nature of measures employed. For instance, the SAC assessed factors that are contemporary or recent, whereas the LSARS was applied to attempts that occurred as far back as ten years. Two consecutive measures/behaviors are expected to be more tightly correlated than two measures or behaviors that occur far apart in time. Finally, given that these results are not cross-validated, it would be desirable to replicate them through future research.

4.9 Strengths

The most important strength of the present study lies in the diverse range of suicidal manifestations that were examined – suicide ideation, clinician judgment of suicide risk, observation level, and lethality. Second, the study involved detailed and comprehensive examination of sociodemographic and clinical correlates of suicide risk. Lastly, the patients studied were from three different state psychiatric hospitals, and there was wide variability with regards to their clinical and sociodemographic status.

4.10 Future Research

A completed suicide is one of the most dreaded outcomes in the field of mental health. The results of the present study offer important insights for future research and should be viewed as a preliminary step towards a more comprehensive understanding of factors associated with suicidality. As a whole, our findings suggest that future research should investigate the role of all three variables – acquired capability for suicide, reasons for attempting suicide, and implicit identification/attitude. Indeed, studies that examine these variables in combination with transient risk factors of depression and hopelessness may lead to a more comprehensive understanding of suicide risk. Researchers could attempt to determine how these three variables interact with depression and hopelessness. It is possible that interactions among these variables result in an increased likelihood of suicidal attempts and eventually, completions.

It should be noted that there is great need for more extensive studies of the theoretical risk factors in general, as much of the available research focuses on empirically identified risk factors (like depression and hopelessness) and does not necessarily examine theoretical risk factors. A study that follows suicidal individuals and examines both theoretical and empirical risk factors may shed light on the construct of suicidality. In addition, it is still unclear what characteristics, if any, individuals who attempt suicide share with those who complete suicide. It is our hope that knowledge gained through such studies will aid researchers and clinicians in developing comprehensive assessment and intervention strategies for suicidal individuals.

The need for more research in this area is a growing concern as chronically suicidal patients enter the mental health system repeatedly. It is important to identify the most effective assessment and treatment strategies for this group.

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Appendix A

Acquired Capability for Suicide Scale

Please read each item below and indicate to what extent you feel the statement describes you. Rate each statement using the scale below and indicate your responses on your answer sheet.

0	1	2	3	4
Not at all like
me				Very much like
me
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
1. Things that scare most people do not scare me.
 2. The sight of my own blood does not bother me.
 3. I avoid certain situations (e.g., certain sports) because of the possibility of injury.*
 4. I can tolerate a lot more pain than most people.
 5. People describe me as fearless.
 6. The sight of blood bothers me a great deal.*
 7. The fact that I am going to die does not affect me.
 8. The pain involved in dying frightens me.*
 9. Killing animals in a science course would not bother me.
 10. I am very much afraid to die.*
 11. It does not make me nervous when people talk about death.
 12. The sight of a dead body is horrifying to me.*
 13. The prospect of my own death arouses anxiety in me.*
 14. I am not disturbed by death being the end of life as I know it.
 15. I like watching the aggressive contact in sports games.

- _____ 16. The best parts of hockey games are the fights.
- _____ 17. When I see a fight, I stop to watch.
- _____ 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.)

*Items 3, 6, 8, 10, 12, 13, and 18 are reverse scored to make higher numbers indicate higher levels of acquired capability.

Appendix B

Reasons for Attempting Suicide Questionnaire

Please rate how much you agree with each of these statements. They describe reasons you may have had for considering an attempt to end your life. In answering, please circle one option per statement.

1. Punish myself.	Completely
Disagree	Agree
A Little	Agree
Somewhat	Almost
Agree	Completely
Agree
2. I seemed to lose control and have no idea why I behaved that way.	Completely
Disagree	Agree
A Little	Agree
Somewhat	Almost
Agree	Completely
Agree
3. Make people sorry for the way they treated me.	Completely
Disagree	Agree
A Little	Agree
Somewhat	Almost
Agree	Completely
Agree
4. Frighten someone.	Completely
Disagree	Agree
A Little	Agree
Somewhat	Almost
Agree	Completely
Agree
5. Because I was angry with someone and wanted to get back at him (her).	Completely
Disagree	Agree
A Little	Agree
Somewhat	Almost
Agree	Completely
Agree
6. Seek help from someone for my nerves and my difficulties.	Completely
Disagree	Agree
A Little	Agree
Somewhat	Almost
Agree	Completely
Agree
7. Make people understand how I was feeling and how distressed I was.	Completely
Disagree	Agree
A Little	Agree
Somewhat	Almost
Agree	Completely
Agree
8. Show how much I love someone.	Completely
Disagree	Agree
A Little	Agree
Somewhat	Almost
Agree	Completely
Agree
9. To find out if someone loves me or not.	Completely
Disagree	Agree
A Little	Agree
Somewhat	Almost
Agree	Completely
Agree

10. Try to influence or change someone's mind.
Completely	Agree	Agree	Almost	Completely
Disagree	A Little	Somewhat	Agree	Agree
11. The situation was so unbearable I felt I had to do something and did not know what else to do.
Completely	Agree	Agree	Almost	Completely
Disagree	A Little	Somewhat	Agree	Agree
12. Escape for a while from an impossible situation.
Completely	Agree	Agree	Almost	Completely
Disagree	A Little	Somewhat	Agree	Agree
13. To get relief from a terrible state of mind.
Completely	Agree	Agree	Almost	Completely
Disagree	A Little	Somewhat	Agree	Agree
14. Because I am not good enough to have accomplished anything worthwhile, I am a failure.
Completely	Agree	Agree	Almost	Completely
Disagree	A Little	Somewhat	Agree	Agree

Appendix C

SPSS syntax for Reasons for Attempting Suicide Questionnaire

1. rasq_1 to rasq_14 are the raw scores on the 14 RASQ items.
2. INT is the computed Internal Perturbation Based Reasons Scale.
3. EXT is the computed Extrapunitive/Manipulative Motivations Scale.
4. Scale scores are calculated providing a patient has no more than one missing response on a scale.

```
recode rasq_1 rasq_2 rasq_11 rasq_12 rasq_13 rasq_14  
  (1=1) (2=2) (3=3) (4=4) (5=5) INTO int1 int2 int3 int4 int5 int6.  
recode rasq_3 rasq_4 rasq_5 rasq_6 rasq_7 rasq_8 rasq_9 rasq_10  
  (1=1) (2=2) (3=3) (4=4) (5=5) INTO ext1 ext2 ext3 ext4 ext5 ext6 ext7 ext8.  
execute.  
compute INT=6*mean.5(int1,int2,int3,int4,int5,int6).  
compute EXT=8*mean.7(ext1,ext2,ext3,ext4,ext5,ext6,ext7,ext8).  
execute.
```

Appendix D

Informed Consent Form

**Department of Psychology
Mail Stop # 948
2801 W. Bancroft Street
University of Toledo
Toledo, Ohio 43606-3390**

ADULT RESEARCH SUBJECT - INFORMED CONSENT FORM

Predictors of Suicide Risk: Capability, Reasons, and Identification

Principal Investigator: Joseph D. Hovey, Ph.D., 419-530-2693
Prachi Kene, M. A., 419-530-2721

Purpose: You are invited to participate in the research project entitled, ‘*Predictors of Suicide Risk: Capability, Reasons, and Identification*’ which is being conducted at the University of Toledo under the direction of Dr. Joseph D. Hovey and Prachi Kene. The purpose of this study is to understand suicidal behaviors. This study will fulfill Ms. Kene’s doctoral dissertation requirements at the University of Toledo.

Description of Procedures: This research will take place at Northcoast Behavioral Healthcare, Northfield, Cleveland, and Toledo campuses from November, 2008 through June, 2009. A total of 100 patients will be participating in this study. You will be asked to complete various questionnaires and a computer task aimed at assessing suicide risk. The questionnaires will probe for various types of information including your feelings and attitudes during the past two weeks; if you have attempted suicide in the past, reasons you have had for considering an attempt; and statements that best describe you. The computer task will involve classifying pictures of skin that has been cut or pictures of non-injured skin that appear on the computer screen as quickly as possible. Your participation will take about 45 minutes. After you have completed your participation, the investigator will disclose to you the purpose of this research study and answer any questions you may

have about the research. The current study will also involve reviewing your medical record (consisting of narrative summary, social work release summary, psychiatric examination, history and physical, psychology evaluation, social work assessment, progress notes, treatment plan, and consultation) from the time of your admission to four months after participating in this study or until your discharge, whichever comes first. The information taken from your medical record will not include any identifiable information.

Potential Risks: **Answering the surveys and taking the computer test might cause you to feel upset or anxious or even suicidal. If so, you may stop at any time.** If you feel suicidal, your treatment team will be notified of your anxiety, distress, and/or suicidal thoughts, and your participation in the study and consequent adverse reactions will be documented in your chart to ensure prompt communication with the treatment team.

Potential Benefits: You will not directly benefit from participating in this study.

Confidentiality: The researchers will make every effort to prevent anyone who is not on the research team from knowing that you provided this information, or what that information is. The consent forms with signatures will be kept separate from responses, which will not include names and which will be presented to others only when combined with other responses. Although we will make every effort to protect your confidentiality, there is a low risk that this might be unintentionally breached. **If you are determined to be a serious threat to yourself, your responses may be shared with the treatment team to prevent you from harming yourself.**

Voluntary Participation:

Your decision to participate or to not participate in this study will NOT:

1. Change the treatment or services you are receiving at Northcoast Behavioral Healthcare;
2. Cause you to gain or lose any rights;
3. Change your date of discharge.

In addition, if you have a forensic status, your decision to participate or to not participate in this study will NOT:

1. Cause your Judge to look at you more favorably or less favorably;
2. Cause your privilege/movement level to be decreased or increased.

In addition, you may discontinue your participation at any time without any penalty, as described above.

Costs of Participation: There will be no costs to you or your insurance company for your participation in this study.

Compensation for Participation: You will receive hygiene products worth \$1.00 for participating in this study.

Contact Information: Before you decide to accept this invitation to take part in this study, you may ask any questions that you might have. If you have any questions at any time before, during or after your participation or experience any psychological distress as a result of this research you should contact a member of the research team – Joseph D. Hovey at (419) 530-2693 or Prachi Kene at (419) 530-2721. If you have questions beyond those answered by the research team or your rights as a research subject or research-related injuries, please feel free to contact the Chairperson of the SBE Institutional Review Board, Dr. Barbara Chesney, in the Office of Research on the main campus at (419) 530-2844.

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

SIGNATURE SECTION – Please read carefully

You are making a decision whether or not to participate in this research study. Your signature indicates that you have read the information provided above, you have had all your questions answered, and you have decided to take part in this research. A copy of this signed consent form will be given to you and another copy will be placed in your medical record.

The date you sign this document to enroll in this study, that is, today's date must fall between the dates indicated at the bottom of the page.

Name of Subject (please print)	Signature	Date
Name of Legal Guardian (please print)	Signature	Date
Name of Person Obtaining Consent	Signature	Date