ABSTRACT

Identifying psychological factors that can predict suicide risk is essential for reducing suicide rates. Shneidman (1993) postulated that psychache (or psychological pain) is a unique predictor of suicide when controlling for other relevant factors such as depression and hopelessness. Previous cross-sectional research has established a relationship between psychache and suicidality, leaving the question of whether or not feelings of psychache actually precede suicidal behaviours unanswered. Two studies were undertaken to increase knowledge on the relationship of depression, hopelessness, and psychache to suicidality. Psychological variables were examined prospectively to allow inferences to be drawn on their causal implications for suicidality. In Study 1, students (n = 1475) completed the Beck Depression Inventory, Beck Hopelessness Scale, Psychache Scale, Beck Scale for Suicide Ideation and provided information about prior suicidal behaviour. Regression analyses revealed that psychache was most strongly associated with suicidality, but that depression and hopelessness still contributed unique variance in the prediction of some suicidal outcomes. In Study 2, a subset of suicide ideators and attempters completed identical materials 10 weeks later (n = 90) and then another 10 weeks after that (n = 56). Again, regression analyses revealed that psychache was most strongly associated with suicidality. When looking at changes over time, dropping one predictor at a time could not overcome problems of multicollinearity, as most models were significant, but with no individual prediction from the factors. Results from models with significant regression coefficients revealed that psychache, hopelessness, and depression may be causes for suicide ideation. Theoretical and practical implications for the statistical prediction of suicide risk are discussed.
ACKNOWLEDGEMENTS

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CHAPTER 1
INTRODUCTION

Research in the area of suicide has become critical in recent years. In the United States, suicide is the 11th leading cause of death (National Institute of Mental Health, 2009) representing an average of 85 suicide deaths every day (Moscicki, 1999). In Canada, suicide takes the lives of over 3,500 people each year (Health Canada, 1994), occurring at a rate of 14 per 100,000 people. These numbers make suicide one of the 10 leading causes of death in Canada. It is important to note that official statistics tend to under-report suicide rates, and that there is an estimated eight to 25 attempts made for every completed suicide (Moscicki, 2001). Suicides also have a large economic impact, as one New Brunswick study showed that the cost per suicide is over $800,000 (Clayton & Barcelo, 2000). Another distressing trend is that since the 1950s, the suicide rate among adolescents in North America has approximately tripled (Health Canada). With such a surprisingly large number of people dying by suicide each year, suicide prevention is an important public health concern. There is also a huge impact on survivors of suicide. Those who have a significant other die by suicide report an exceptionally high level of distress and impairment, and researchers have found that a quarter of these individuals went on to think about suicide from a moderate to high degree (McMenamy, Jordan, & Mitchell, 2008). Therefore, it is crucial that researchers and health practitioners are better able to identify who is at risk and to design effective prevention programs.

Factors Related to Suicide

Suicide prevention must begin with identification of who is at risk. In 1994, the Task Force on Suicide in Canada (Health Canada, 1994) called the identification of risk
factors for suicide “one of the most vexing problems facing professionals in the health sciences” (p. xi). A number of perspectives, including, but not limited to, psychiatric (Harris & Barraclough, 1997), genetic (Roy, 1992), cultural (Kral, 1998), and psychological (Beck, Steer, Kovacs, & Garrison, 1985; Shneidman, 1993) have been taken in an attempt to better understand suicide risk and have led to more knowledge on variables related to suicide.

From demographic information, we know that men are three times more likely to die by suicide than are women (Statistics Canada, 2005), but that women are much more likely to attempt suicide (Moscicki, 2001). Research has also shown that suicide risk increases with age, and that whites are twice as likely as non-whites to die by suicide. Although this information is informative, it provides no sensitivity or specificity. It does not allow practitioners to properly assess their clients for suicide risk nor does it inform intervention. Researchers focused on suicides that occur after discharge from psychiatric hospitalization have also examined sociodemographic variables predicting suicide risk. One review found that being unemployed and living alone was associated with higher risk (Troister, Links, & Cutcliffe, 2008). Although this type of information may be more informative, it still represents variables that health practitioners may not have the ability to change or to address in prevention programs.

Identifying psychological variables associated with suicidality\(^1\) represents an important avenue for assessing risk, because these variables can be targeted during interventions and are more amenable to change. The presence of a mental disorder

\(^1\)Definitions for all terms related to suicide may be found in Table 1
Table 1

*Definitions of Terms Related to Suicide*

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parasuicide</td>
<td>An apparent attempt at suicide, where the aim is not death. For example, a sublethal drug overdose.</td>
</tr>
<tr>
<td>Suicidality</td>
<td>General term related to all manifestations that indicate one’s tendency to suicide, including thoughts and actions.</td>
</tr>
<tr>
<td>Suicide Ideation</td>
<td>Term related to having thoughts about suicide. These thoughts can vary in severity and may or may not involve thinking about an actual plan to commit suicide.</td>
</tr>
<tr>
<td>Suicide Intent</td>
<td>An individual’s intensity or strength of their wish to die during a suicide attempt.</td>
</tr>
<tr>
<td>Suicide Motivation</td>
<td>Passive component of suicidal ideation, including one’s attitude towards living or dying, and the frequency and duration of thoughts of suicide.</td>
</tr>
<tr>
<td>Suicide Preparation</td>
<td>A more active component of suicidal ideation, involving carrying out steps to a suicide attempt such as making a plan or formulating a suicide note.</td>
</tr>
</tbody>
</table>
provides the context for a large majority of attempted and completed suicides. Findings from the United States and Europe show that over 90% of individuals who die by suicide suffer from a mental or addictive disorder (Moscicki, 2001). Both schizophrenia and alcohol abuse are associated with higher rates of suicide. Although the lifetime risk of suicide in the general population is 1.4%, rates for individuals with schizophrenia and alcoholism are 10% and 3% respectively (Clark & Fawcett, 1992). A mood disorder is the diagnosis most commonly seen in those dying by suicide (Moscicki, 1999; Troister, Links, & Cutcliffe, 2008).

**Depression and its Association with Suicidality**

Depression in particular has long been a well-recognized risk factor for suicide (Robins, Schmidt, & O’Neil, 1959). A major depressive episode is the most common Axis I disorder diagnosed in individuals who go on to die by suicide, with some estimates as high as 87%. Literature has also shown that the possibility of dying by suicide if currently suffering from unipolar major depression is 20 times higher than would be expected in the general population (Cheng, Chen, Chen, & Jenkins, 2000).

Beck’s cognitive theory of depression and its relation to suicide is the broadest in scope, postulating that negative cognitions about the self, the world, and the future can explain depressive symptoms. He believed that depressed individuals see themselves as inadequate and unworthy because of their own perceived defects. Depressed individuals are presumed to have a biased perspective towards the world and their own life events, interpreting everything through a lens of negativity. When looking to the future, the depressed person believes that this suffering will continue indefinitely (Rush & Beck, 1978). Beck called these beliefs automatic and dysfunctional thoughts, and believed that
depressed individuals favour these negative beliefs while excluding more positive cognitions (Haaga, Dyck, & Ernst, 1991). An individual begins having suicidal thoughts as a means to escape from their problems when they become too unbearable (Rush & Beck). The depressed person, who considers themselves a burden, may also believe that other people will be better off if he/she were dead.

Although support for Beck’s theory has varied, a large review found support for the notion that depressed individuals think more negatively about themselves, the world, and the future (Haaga et al., 1991). Extending from his theory, Beck is also the founder of cognitive-behavioural therapy for depression. This treatment strategy has been shown effective in numerous studies (Beck, 1993) and supports the notion that better treatment of depression reduces the number of suicide victims (Rihmer, 2001). An abundance of other research has supported the notion that depression is associated with suicidality. One study of attempters showed that 80% scored in the depressed range on the Beck Depression Inventory (BDI), with a significant correlation between the depth of depression and suicidal intent (Silver, Bohnert, Beck, & Marcus, 1971). Longitudinal work found that risk of completed suicide was approximately three times higher in severely depressed people, as opposed to those with mild depression (Bradvick, Mattisson, Bogren, & Nettelbladt, 2008). Prospective studies of suicide attempts found that a worsening of the course of major depressive disorder in the month prior to the attempt was predictive of an attempt (Yen, Shea, Pagano, Sanislow, Grilo, et al., 2003). Although it is clear that depression plays a role in suicide, not every depressed person is suicidal and not all suicide attempts occur during a depressive episode (Harkavy-Friedman, Nelson, Venarde, & Mann, 2004).
Hopelessness and its Association with Suicidality

While investigating the nature of the relationship between depression and suicide, Beck recognized that the cognitive distortions prominent in depressed persons were most relevant to suicidal behaviour (Beck, 1963), and believed that affective symptoms were secondary. He noted that “Suicidal preoccupations... seemed related to the patient’s conceptualization of his situation as untenable or hopeless” (p. 328). Subsequently, the study of hopelessness, or a negative view of the future (Beck), as a cause of suicide flourished (Beck & Lester, 1973; Minkoff, Bergman, Beck, & Beck, 1973; Wetzel, Marguiles, Davis, & Karam, 1980). A number of studies in which factor analysis was conducted on the Beck Depression Inventory (Cropley & Weckowicz, 1966; Weckowicz, Muir, & Cropley, 1967; Weckowicz, Yonge, Cropley, & Muir, 1971) confirmed this view. A pattern emerged among these studies, such that one factor consistently linked negative attitudes about the future with suicidal wishes among samples of depressed individuals and suicide attempters (Beck & Lester, 1973).

Numerous researchers went on to study the relationship between depression, hopelessness, and suicidality. Minkoff, Bergman, Beck, and Beck (1973) examined the nature of the relationship between depression, hopelessness and suicide intent with a group of suicide attempters. They found that their measure of hopelessness was a stronger indicator of suicide intent than was depression. Beck and colleagues designed the Beck Hopelessness Scale (BHS) to quantify hopelessness, and original analyses again showed that the statistical relationship between suicide attempt and depression is due to an underlying cause in both factors, that of hopelessness (Beck, Weissman, Lester, & Trexler, 1974). An abundance of studies have found similar results, showing that
hopelessness is an indicator of current suicide intent (Lester, Beck, & Mitchell, 1979; Nekanda-Trepka, Bishop, & Blackburn, 1983; Weishaar & Beck, 1992). Although hopelessness correlates significantly with suicidal intent when controlling for levels of depression, correlations between depression and suicide intent have not been found when hopelessness has been controlled (Beck, Kovacs, & Weissman, 1975; Dyer & Kreitman, 1984).

There have also been a number of large scale prospective studies examining the contributions of both depression and hopelessness to completed suicide. In a study by Brown, Beck, Steer, and Grisham (2000), results showed that psychiatric outpatients who scored nine or above on the Beck Hopelessness Scale (BHS) were four times more likely to die by suicide than patients who had scored eight or below. In this case, depression and suicide ideation were also risk factors for eventual suicide. In a study of people admitted to hospital for suicidal ideation, only hopelessness and the pessimism item of the BDI predicted eventual suicide. A score of 10 or more on the BHS identified 91% of suicides (Beck, Steer, Kovacs & Garrison, 1985). However, many individuals with a score of 10 or more did not go on to die by suicide, showing that hopelessness cannot fully account for suicidality. In a study of alcohol abusers admitted to hospital because of a suicide attempt, neither depression nor hopelessness was a predictor of eventual suicide (Beck, Steer, & Trexler, 1989). Another similar study of attempters found that only a diagnosis of alcoholism was a predictor of eventual suicide (Beck & Steer, 1989).

Other theories have combined both depression and hopelessness in an attempt to explain the cause of suicide. Abramsom, Metalsky, and Alloy (1989) argued that hopelessness depression is a subtype of depression that is distinct from other proposed
subtypes of depression and is most associated with suicidality. This theory postulates that suicidal individuals have negative expectations about the occurrence of highly valued outcomes, and believe that nothing can be done to change the likelihood of these outcomes occurring. Abramson and colleagues discussed suicide ideation and attempts as symptoms of hopelessness depression. They believed that although some symptoms of this subtype overlap with general depression, such as sadness or lack of motivation, other symptoms, such as suicidality, may not overlap. This notion may help to explain the smaller group of suicides in individuals who are not diagnosed with depression. Some research has provided empirical support for the notion that the hopelessness depression cluster is a distinct depressive syndrome (Abramson et al., 1998; Joiner, 2001; Joiner et al., 2001); however, other research has not found the existence of a distinct subtype (Whisman & Pinto, 1997).

It is clear from an abundance of literature that both hopelessness and depression are moderately strong predictors of who will attempt, and die by, suicide (Lester, Beck, & Mitchell, 1979; Thompson, Mazza, Herting, Randell, & Eggert, 2005). However, neither one of these constructs alone or combined is able to fully account for and/or predict suicidality. It is clear that not all depressed people die by suicide, and not all people who die by suicide are clinically depressed (Baumeister, 1990).

Psychache and its Association with Suicidality

Although both depression and hopelessness have received abundant support as psychological predictors of suicidality, another variable is emerging as an important predictor. Edwin Shneidman, a prominent researcher in the area of suicidology, proposed that psychological pain, or psychache, is necessary and sufficient for suicide to occur, and
that it mediates the effects of all other factors, such as depression and hopelessness, in their association with suicide (Shneidman, 1993). He discussed that all suicidal individuals are in a state of perturbation, referring to being upset, or mentally distressed. He postulated that psychache is the introspective recognition of, or the psychological pain associated with perturbation (Shneidman, 1999a). Shneidman defines psychache as the “hurt, anguish, soreness, aching, psychological pain in the psyche, the mind.” (Shneidman, 1993, p. 145). He argued that all other factors are secondary, and only important to suicide insofar as their association with psychache.

For an individual to die by suicide, Shneidman states that the perception of the pain must be unbearable for that person, and that stopping the pain by stopping consciousness is perceived as the only solution. Therefore, suicide is considered the only means to escape the intensely felt psychache. “Suicide is...not so much a movement toward death as it is a movement away from...intolerable emotion, unendurable pain or unacceptable anguish” (Shneidman, 1984, p. 322).

To summarize, Shneidman (1993) identified six steps in a progression towards a suicidal outcome as: (1) the presence of stresses, failures, or rejections, either social or psychological; (2) influence of other vulnerabilities such as genetic or social factors; (3) stresses are perceived as negative and painful; (4) perception of the psychological pain as unbearable and intolerable; (5) thinking that the only solution for the pain is the cessation of consciousness; and (6) psychological pain that exceeds that individual’s tolerance threshold. In this progression, suicide is the likely outcome, and one that Shneidman deems a practical act that is logical to the individual (Shneidman, 1992).
Shneidman postulated that the cause of psychache is unfulfilled psychological needs (Shneidman, 1993, 1999a). He differentiated between two types of needs. Modal needs are those that define a person’s personality in its day-to-day functioning, and vital needs are those that an individual could not tolerate being blocked—those that a person would die for. Each individual weighs these needs in an idiosyncratic manner according to their personality and their vulnerability to suicide (Shneidman, 1999a).

These ideas are based on Murray’s (1938) volume *Explorations in Personality*, which provides a list of twenty-one psychological needs. Originally, Shneidman believed that all of these needs, alone or in combination, could account for a suicidal act (1984), however, in 2001 he identified seven of these needs as most frequently associated with suicide: (1) achievement: the need to accomplish something difficult or challenging, (2) affiliation: the need to be near or join with a friend or loved person, (3) autonomy: the need to be independent and free from restraint, (4) counteraction: the need to make up for failure by restriving, (5) infavoidance: the need to avoid humiliation or embarrassment, (6) order: the need to put things or ideas in order, or to achieve balance and precision, and (7) succorance: the need to be supported, loved, and cared for. When one or more of these needs are not met, mental pain is felt, and the individual wants to put an end to this pain.

Shneidman believed that the most relevant treatment to heightened suicidality is to identify each individual’s blocked needs. By addressing the frustrated needs implicated in each particular case, the individual’s pain, or psychache levels, will be reduced and suicide can be prevented (Shneidman, 2001). If the pain can be relieved, the individual would be willing to continue to live (Shneidman, 1984).
Current literature has examined both internal perturbations and psychache as predictors of suicidality, and their contribution to suicidal outcomes in relation to other psychological variables. In the literature, psychache and internal perturbation have been equated (Davie, 2005; Holden & McLeod, 2000) and will be used interchangeably throughout this thesis. Terms such as mental pain, psychological pain, emptiness, and psychological quality of life have also been used to refer to the same construct. Some of these terms may be used throughout this thesis when referring to the terms used by other researchers. However the current studies will discussed using the term psychache.

Examination of suicide notes reveals that wanting to escape from unbearable psychological pain is a common theme (Leenaars, 1991; Valente, 1994). Internal perturbations have been shown to correlate with patients’ wish to die and clinicians’ ratings of patients’ suicidal desire and preparation (Holden, Kerr, Mendonca, & Velamoore, 1998), and to be a significant, nonredundant predictor of suicide ideation, number of attempts, and likelihood to commit suicide, when also accounting for levels of depression and hopelessness (Johns & Holden, 1997). In a forensic sample, internal perturbation outperformed hopelessness in predicting suicidality (Holden & Kroner, 2003).

Using the Psychological Pain Assessment Scale (PPAS; Shneidman, 1999b), both current and worst-ever psychache were found to be significantly higher in those patients deemed to be at risk of suicide by a psychiatrist (Pompili, Lester, Leenars, Tarelli, & Girardi, 2008). Other researchers utilizing this scale found that worst ever psychache was associated with both current depression and a history of suicide ideation (Lester, 2000).
However, researchers recommended the use of other scales to measure psychache due to the need for multi-item measures to examine current psychological pain.

To remedy the problems with Shneidman’s scale, Holden et al. (2001) created the 13-item Psychache Scale. The scale was evaluated on a group of university students, and results showed that psychache and hopelessness were both unique contributors to suicide ideation, but that psychache had the largest standardized regression coefficient. In a sample of suicide attempters, Flynn and Holden (2007) found that psychache, hopelessness, and internally and externally motivated reasons for attempting suicide all provided unique statistical prediction to suicidality. Psychache was also correlated with attempter status in an offender sample (Mills, Green, & Reddon, 2005). In a group of female university students, results indicated that psychache was the only variable that contributed significant and unique variation to the prediction of suicide ideation and self-injury.

Holden et al. (2001) postulated that the link between hopelessness and self-destructive behaviours may be mediated by psychache. This claim is in line with Shneidman’s view that psychache mediates the relationship between other predictors and suicide. Testing this hypothesis, Munchua (2003) found good fit for a model in which psychache mediated the effects of hopelessness and depression, and was the most proximal factor associated with suicidality. Psychache has also been found to mediate the relationship between perfectionism and suicidality (Flamenbaum & Holden, 2007).

Mental pain, a term akin to psychological pain, has also been operationalized with the Orbach and Mikulincer Mental Pain Scale (OMMP; Orbach, Mikulincer, Sirotai, & Gilboa-Schechtman, 2003). In one study, Orbach and colleagues found that suicidal
inpatients scored significantly higher on the OMMP Scale than nonsuicidal inpatients and controls. After controlling for hopelessness, depression, and anxiety, results showed that the OMMP factor of emptiness still made a unique contribution in the differentiation of the suicidal group (Orbach, Mikulincer, Gilboa-Schetchman, & Sirota, 2003). Therefore, certain factors on the OMMP Scale may be more important than depression and hopelessness in the prediction of suicidality.

Another important study evaluated the relationship between mental pain, suicidality, and life meaning, with mental pain operationalized by six psychological domains on the World Health Organization’s Quality of Life Instrument, which included questions on emotions, such as despair, and on meaninglessness of life. Results showed that psychological quality of life had a unique relationship to suicidality that was not accounted for by the other psychological variables (Berlim et al., 2003). Although using a different measure of mental pain, these findings are consistent with Shneidman’s perspective on suicidality.

It is clear from current literature that empirical support for psychache as a predictor of suicidality is mounting and that it merits consideration alongside depression and hopelessness as a psychological predictor of suicide. The initial support for psychache is strong, but more research is necessary to bring it forward as a main predictor of suicide risk. At present, all published research in this area has been cross-sectional. Therefore, although it is clear that psychache is strongly related to suicidality, it is unclear if psychache is a cause of, a consequence of, or just related to suicide-related behaviours. Only a prospective design can disentangle this information by demonstrating that psychache precedes later suicidal behaviour.
Longitudinal designs are relatively rare in any research using death by suicide as the dependent variable. Suicide is an extremely rare and difficult event to predict and, therefore, large numbers of individuals must be enrolled and followed for up to 20 years to properly research the incidence of suicide in a longitudinal fashion. Although Aaron Beck and colleagues have conducted numerous prospective studies, none to date have included psychological pain as a predictor.

Although a prospective design with enough participants and length of time to examine death by suicide is unrealistic for a Master’s thesis, individuals who have attempted suicide in the past or are reporting current suicide ideation represent a unique group to examine prospectively. It is well established in the literature that a history of suicidality, including attempts, self-harm, and ideation, is predictive of future suicide attempts (Joiner et al., 2005; King et al., 2001). Therefore, using suicide ideation and attempts as a proximate measure of suicide is useful. In addition, suicide ideation and attempts themselves are distressing outcomes, and learning more about how to predict and prevent these suicidal manifestations is an important undertaking.

The Present Studies

One of the purposes of this research was to evaluate the contributions of depression, hopelessness, and psychache to the prediction of suicidality in an undergraduate population to evaluate to Shneidman’s theory. The predictor variables were assessed using the Beck Depression Inventory (Beck, Steer, & Brown, 1996), the Beck Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974), and the Psychache Scale (Holden, Mehta, Cunningham, & McLeod, 2001). The criterion variable, suicidality, was assessed using the Beck Scale for Suicide Ideation totals and its subscales
of Suicide Motivation and Suicide Preparation (Beck, Kovacs, & Weissman, 1979), as well as attempter status and number of lifetime attempts.

The second purpose of this research was to evaluate the contributions of these variables to the prediction of suicidality in a subset of suicide ideators and attempters. The third and principal purpose of this research was to follow a group of suicide ideators and attempters longitudinally to establish that psychological pain precedes suicide ideation in order to infer causation.

It was hypothesized that psychache would emerge as the strongest statistical predictor of suicidality in a general sample of undergraduates, and a subset of suicide ideators and attempters. It was also predicted that in the longitudinal design, changes in levels of psychache would be the strongest statistical predictor of changes in levels of suicide ideation over time. This relationship was expected to hold true after controlling for changes in depression and changes in hopelessness. This finding would further our knowledge of psychache, allowing for inferences to be drawn on the causal implications of psychache for suicidality.

CHAPTER 2

STUDY 1

Method

Participants

Fourteen hundred and seventy-five undergraduate students at Queen’s University in Kingston, Canada participated in a pre-screening session for the introductory psychology course subject pool in the fall. Participants ranged in age from 16 to 45 years ($M = 18.36, SD = 2.09$) and 71% ($n = 1052$) were women. Thirty-eight participants
reported having previously attempted suicide, with pills being the most common method (44.1%, n = 15), followed by cutting (26.5%, n = 9). Suicide attempters reported a mean of 41.39 months since their most recent suicide attempt (SD = 34.04, range = 2 to 168), and a moderate to high level of suicide intent at the time of that attempt (M = 3.12, SD = 1.22) on a five-point rating scale. Their number of lifetime attempts ranged from 1-11 (M = 1.66, SD = 1.78).

**Materials**

**Beck Depression Inventory (BDI-II)**

The BDI-II (Beck, Steer, & Brown, 1996) is a 21-item scale used to measure depression severity in adolescents and adults. This version of the BDI was created in response to changes in the diagnostic criteria for major depression. Participants rate each item on a 4-point scale on which symptoms increase in severity from 0 to 3. Participants are asked to respond to each item according to their experiences over the past two weeks, including the day of testing. Beck, Steer, and Garbin (1988) reviewed over 20 years of research on the psychometric properties of the original inventory. Their meta-analysis has shown that the average correlation of the BDI with clinical ratings and with the Hamilton Rating Scale for Depression are .72 and .73, respectively, for psychiatric patients, and .60 and .74, respectively, for nonpsychiatric samples. Research has shown the BDI-II to have construct validity (Steer, Ball, Ranieri, & Beck, 1997), high internal consistency (Beck, Steer, Ball, & Ranieri, 1996), and to be a stronger instrument than the BDI-I in terms of its factor structure (Dozois, Dobson, & Ahnberg, 1998).
**Beck Hopelessness Scale (BHS)**

The BHS (Beck et al., 1974) is a 20-item true/false record that assesses an individual’s negative expectations for the future. Beck et al. tested the scale’s psychometric properties on a group of patients hospitalized for a suicide attempt. They reported an alpha reliability coefficient of .93. Their research found that the correlation of the BHS with clinical ratings of hopelessness is .62, and ranged from .60 to .63 with other self-administered measures of hopelessness. With a three-week interval, the scale also showed high test-retest reliability of .85 in a group of undergraduate students (Holden & Fekken, 1988).

**Psychache Scale**

The Psychache Scale (Holden, Mehta, Cunningham, & McLeod, 2001) is a 13-item self-report scale used to assess Shneidman’s (1993) conceptualization of psychache or psychological pain. Responses are coded on a 5-point Likert scale. Alpha reliability coefficients of .92 and .95 have been reported in university and offender populations, respectively (Holden et al.; Mills, Green, & Reddon, 2005). The Psychache Scale has also been shown to distinguish between suicide attempters and nonattempters, and to statistically predict suicide ideation when the effects of depression and hopelessness have been controlled (Holden et al.). A copy of the scale can be found in Appendix A.

**Beck Scale for Suicide Ideation (BSS)**

The BSS (Beck & Steer, 1991) is a 19-item scale used to measure suicide ideation and intent. Each item is comprised of three statement options which are scored from 0 to 2 based on increasing intensity of suicidality. Alpha reliability coefficients have ranged from .84 to .93 in psychiatric samples (Beck, Brown, & Steer, 1997; Beck, Kovacs, &
Weissman, 1979; Beck, Steer, & Ranieri, 1988). The BSS can be divided into two subscales (Beck, Brown, & Steer, 1997): Motivation and Preparation. Motivation refers to individuals’ attitudes about living and dying, and measures formal characteristics of ideation such as the frequency and duration of suicidal thoughts. Preparation refers to a more active stage that involves a formulation of the contemplated suicide attempt. A study of suicide attempters found support for this two-factor model (Holden & DeLisle, 2005), with alpha reliability coefficients of .85 for Motivation and .73 for the Preparation subscale.

Procedure

Participants who completed the subject pool screening received a large package of questionnaires in person that included the above questionnaires. All participants received a general letter of information and gave informed consent before completing the questionnaires. Participants were also asked to provide their age and gender, as well as to indicate whether they had ever attempted suicide, how long ago their most recent attempt was, how they attempted to commit suicide, how intent they were on killing themselves during their most recent attempt, and how many times they had attempted suicide in their lifetime.

Results

Preliminary Analyses

Prior to conducting any analyses, the data were screened for accuracy and missing values. Out of range values were corrected by verifying the correct values with the participants’ original answer sheets. If participants were missing no more than 10% of
data on a particular scale, scale scores were prorated. Nonattempts received a score of zero for whether or not they had made a suicide attempt.

**Descriptive Statistics for Predictors and Measures of Suicidality**

Means, standard deviations, observed ranges, coefficient alpha reliabilities, and correlations between variables are shown in Table 2. The means, standard deviations, and alpha coefficients of the predictor scales were comparable to those found in other groups of university undergraduates (DeLisle & Holden, 2009; Flamenbaum & Holden, 2007; Holden et al., 2001). For the total score on the BSS, and its subscales of motivation and preparation, means and standard deviations were also comparable to those found in university undergraduates (DeLisle & Holden; Flamenbaum & Holden; Holden et al.). The alpha coefficient for the total score was lower than that reported by Beck and Steer (1991) for a group of psychiatric inpatients, but similar to those found in a group of female undergraduates (Holden et al.). The reliability of the suicidal motivation and suicidal preparation subscales was acceptable but lower than those reported in other research on university students (DeLisle & Holden; Holden & DeLisle, 2005). Therefore the current study will examine both subscales and the BSS total, but Study 2 will only use the total score.

**Correlations Among All Measures of Suicidality**

Correlations among all variables are shown in Table 3. Significant, positive correlations were obtained between depression, hopelessness, and psychache. The correlations between the predictor variables are comparable to those found in other research with university students (DeLisle & Holden, 2009). Significant, positive correlations were also found between the three predictor variables and each of the
Table 2

Means, Standard Deviation, and Reliabilities for All Measures in Total Sample (N = 1475)

<table>
<thead>
<tr>
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<th>Possible Range</th>
<th>Observed Range</th>
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<td>Psychache Scale</td>
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<td>13-65</td>
<td>20.55</td>
<td>8.22</td>
<td>.94</td>
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<td>.70</td>
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<tr>
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<td>1-11</td>
<td>1.66</td>
<td>1.78</td>
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</tr>
</tbody>
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*Note.* Some descriptive statistics are based on fewer than 1475 participants due to missing data.
### Table 3

*Intercorrelations Among All Measures of Suicidality (N = 1475)*

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<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tr>
<td>1. Depression</td>
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<td>2. Hopelessness</td>
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<td>.48**</td>
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<td>.55**</td>
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<td>.51**</td>
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<tr>
<td>8. Lifetime Attempts</td>
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<td>.53**</td>
<td>.67**</td>
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</tbody>
</table>

*Note. Due to missing data some correlations are based on fewer than 1475 participants. *p* < .05 and **p* < .01, two-tailed. Correlations of .10, .30, and .50 correspond to small, medium, and large effect sizes, respectively.*
criterion variables, including suicidal ideation, suicidal motivation, suicidal preparation, attempter status and number of lifetime attempts. In terms of magnitude, each outcome variable was most strongly correlated with psychache, as compared to their correlations with depression and hopelessness.

**Multiple Regression Analyses**

**Consideration of Statistical Assumptions**

To test the assumptions of multiple regression, the normality of each predictor and outcome variable was assessed by calculating indices of skewness and kurtosis and by visually inspecting histograms. A lack of normality was indicated if the ratio of skewness or kurtosis to its standard error was greater than three or less than negative three. All variables were positively skewed and severely leptokurtic. Assumptions of linearity, homoscedasticity, and independence of errors were all confirmed by visual inspection of plots of standardized residual scores versus standardized predicted scores.

Due to violations of normality, a nonparametric bootstrapping approach was used to analyse the data. Parametric tests are most commonly used, however, they require a number of assumptions to be met with respect to the data, such as that it is normally distributed. Bootstrapping, on the other hand, places no such requirements on the data because the sampling distribution serves as the population. From this population, a large number of samples of size \( n \) are drawn randomly and with replacement. The statistic of interest is then calculated for each bootstrapped sample. The distribution of this statistic then represents the true sampling distribution (Cirincione & Gurrieri, 1997), which can be used to make inferences about population parameters and to generate confidence intervals for significance testing. For all subsequent analyses, bootstrapping was used to construct
confidence intervals around regression coefficients using 5000 resamples to test for significance.

Data Analyses

To assess the relative importance of each predictor, criterion scales were regressed on all predictors and statistically significant standardized regression weights were compared. The results of these regressions can be seen in Table 4. For suicide ideation, $R^2 = .36$, suicide motivation, $R^2 = .34$, and suicide preparation, $R^2 = .24$, psychache contributed the greatest variance, followed by hopelessness, and depression. For attempter status, $R^2 = .07$, and number of lifetime attempts, $R^2 = .26$, only psychache contributed significant, unique explanatory variance. For both attempter status and lifetime attempts, depression and hopelessness failed to reach significance. These findings suggest that psychache is the predictor most strongly associated with suicidality.

Discussion

The purpose of this study was to evaluate the contributions of depression, hopelessness, and psychache in the prediction of suicidality in a large sample of undergraduate students. The results support the notion that depression, hopelessness, and psychache are all predictors of suicidal ideation, suicidal motivation, and suicidal preparation. This finding is consistent with previous research examining university students (Munchua, 2003). Only psychache was found to be a unique statistical predictor of attempter status and number of lifetime attempts. These findings support the notion that psychache should be considered alongside depression and hopelessness as a leading variable associated with suicide risk (DeLisle & Holden, 2009; Holden et al., 2001).
Table 4

Regression Coefficients for Predicting Suicidality

<table>
<thead>
<tr>
<th>Statistical Predictor</th>
<th>Suicidal Ideation</th>
<th>Suicidal Motivation</th>
<th>Suicidal Preparation</th>
<th>Attempter Status</th>
<th>Lifetime Attempts</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R^2 )</td>
<td>.36***</td>
<td>.34***</td>
<td>.24***</td>
<td>.07***</td>
<td>.26***</td>
</tr>
<tr>
<td>Intercept</td>
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<td>-1.0</td>
<td>.34</td>
<td>-.07</td>
<td>-.63</td>
</tr>
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<td>Depression</td>
<td>.09</td>
<td>.17*</td>
<td>.04</td>
<td>.19*</td>
<td>.03</td>
</tr>
<tr>
<td>Hopelessness</td>
<td>.24</td>
<td>.19*</td>
<td>.13</td>
<td>.23*</td>
<td>.10</td>
</tr>
<tr>
<td>Psychache</td>
<td>.15</td>
<td>.34*</td>
<td>.06</td>
<td>.28*</td>
<td>.09</td>
</tr>
</tbody>
</table>

Note. *p < .05, **p < .01, ***p < .001, two-tailed.
Shneidman (1993) believed that the effects of all other variables on suicide are mediated by psychache, making it the most specific factor associated with suicide. In the current study, the associations between the BSS scales and hopelessness and depression were not completely residualized by psychache as Shneidman would have predicted. Both depression and hopelessness contributed significant, unique explanatory variance to these outcomes. However, psychache did account for unique variance in suicidality and was found to be the most important predictor of the BSS total and subscales, as evidenced by its larger standardized regression coefficients. The standardized coefficients of depression, and hopelessness were, in some cases, only half as strong as that of psychache. This finding supports the hypothesis that psychache is a stronger statistical predictor of suicidality than either depression or hopelessness as it was the most consistently and clearly indicative of a proneness towards suicidality. Past research using path analyses have indicated that data from a group of attempters fits an a priori model in which depression, hopelessness, and psychache are progressively more strongly associated with suicidality (Munchua, 2003).

The moderately high correlation found between depression and hopelessness ($r = .52$) in this sample is inconsistent with Abramson et al.’s (1989) theory that hopelessness is a subtype of depression. If hopelessness was a subtype of depression, one would have expected a higher correlation between the two variables. This finding is in line with DeLisle and Holden (2009) whose more extensive research findings also did not support the hopelessness depression theory.

Some researchers have suggested that depression, hopelessness, and suicidal ideation constitute one syndrome, and are not distinct (Shahar, Baraket, Rudd, & Joiner,
Based on their analyses, DeLisle and Holden (2009) concluded that depression, hopelessness, and psychache are empirically distinct, but highly correlated factors. In their sample, correlations between the three predictors ranged from $r = .62$ to $r = .76$. The associations between predictors in the current study were lower, ranging from $r = .48$ to $r = .65$. These correlations suggest that depression, hopelessness, and psychache were also empirically distinct in this group, but highly related.

It should be noted that the use of retrospective variables (i.e., attempter status and number of lifetime attempts) in a regression model presents a limitation in this study. However, past research has shown that a history of suicidal behaviours, particularly having made an attempt, is the most important predictor of future suicidality (Joiner et al., 2005).

Another limitation of this study was that, like in past research, the design was cross-sectional. Therefore, causal inferences between the predictor and outcome variables cannot be directly made. Shneidman (1993) believed that psychache was the most important predictor of completed suicide and other suicidal manifestations. Longitudinal research is needed to properly evaluate his theory. Thus in Study 2, a subset of suicide ideators and attempters were examined in a prospective manner.

CHAPTER 3

STUDY 2

Method

Participants

A total of 169 individuals were identified in the pre-screen sample as having a history of a suicide attempt and/or who were reporting current suicidal ideation. Beck and
Steer (1991) stated that items #4 (Active Suicidal Desire) and #5 (Passive Suicidal Desire) on the BSS could be used to identify suicide ideators. Participants were included in the current study if they gave a rating of one or two on either of these items. Thus, suicide ideators have been operationally defined as individuals who have either active or passive or both types of thoughts about killing themselves (Pinninti, Steer, Rissmiller, Nelson, & Beck, 2002). There were a number of individuals in the sample who reported a past suicide attempt, but did not report current ideation. These individuals were included, and therefore this group of participants will be referred to as the high-risk sample.

Individuals were contacted via email to participate in the longitudinal portion of the study. Group A are the 90 individuals who responded at Time 2. Group B are the 56 participants who responded at Time 2 and at Time 3. Throughout this paper, these groups will be referred to as A and B. It should be noted that the group of 56 individuals is a subset of the group of 90 individuals.

In group A, participant’s ages ranged from 17 to 31 years (\(M = 18.18, SD = 1.71\)) and 77% (\(n = 69\)) were women. Twenty-one participants reported having previously attempted suicide, with pills being the most common method (38.1%, \(n = 8\)), followed by cutting (23.8%, \(n = 5\)).

In group B, ages ranged from 17 to 22 years (\(M = 17.87, SD = 0.87\)), and 79% (\(n = 44\)) were women. Fifteen participants reported having previously attempted suicide, with pills being the most common method (40.0%, \(n = 6\)), followed by cutting (13.3%, \(n = 2\)).

Participants completing materials at Times 2 and 3 were treated in accordance with ethical standards. Participants were informed prior to completing the online
questionnaires that they were free to withdraw from the study at any time without penalty. They were also given the option to be taken off the study’s email list. They were provided with a letter of information, a consent form, and a debriefing sheet, which elaborated on the purpose of the study more fully. At the end of the study, participants were provided with a number of resources in Kingston. Participants were encouraged to use these resources if completing the questionnaires had caused them to feel emotional distress, or if participants wanted to speak to someone about their feelings. During the course of the study, one student emailed the laboratory to request additional information regarding where to go to talk about how he/she had been feeling.

*Materials and Procedure*

Participants were contacted 10 weeks after the pre-screen to participate at Time 2. All questionnaires were identical to those given during the pre-screen, but were to be completed online. After completing the questionnaire package, participants could choose between two types of compensation. Individuals chose to receive one credit towards their psychology research credits, or to receive $10 for their participation. At the end of the survey, participants were also asked if they would like to be contacted again in the future to complete identical materials for the same compensation. If students were interested, they were asked to provide a current email address that could be used to contact them. Those who indicated that they would like to participate again were contacted 10 weeks later (Time 3) to partake in the same procedure.
Results

Preliminary Analyses

Prior to conducting any analyses, the data were screened for accuracy and missing values. Inaccurate data were not found as all data were downloaded from the online survey program. Participants were able to leave questions unanswered. If participants were missing no more than 10% of data on a particular scale, scale scores were prorated. Nonattempters received a score of zero for whether or not they had made a suicide attempt.

Descriptive Statistics for Predictors and Measures of Suicidality

Means, standard deviations, observed ranges, coefficient alpha reliabilities, and correlations for group A are shown in Tables 5 and 6. Descriptive statistics for group B are shown in Tables 7, 8, and 9. As expected, means for predictor variables and suicidal outcomes in the attempter and suicide ideator samples were higher than those found in the larger, nonclinical sample of undergraduates from Study 1.

For Group A, there were no statistically significant differences on depression or psychache between Time 1 and Time 2. Participants’ scores on the BHS, \( t(89) = -3.28, p < .01 \), were significantly higher at Time 2, and scores on the BSS, \( t(87) = 3.91, p < .001 \), were significantly lower at Time 2. For group B, only participants’ psychache scores did not change across times. Hopelessness scores increased from Time 1 to Time 2, \( t(54) = -3.87, p < .001 \), whereas suicide ideation scores were lower, \( t(54) = 3.18, p < .01 \). This pattern was the same between Time 1 and Time 3, as scores on these variables did not change between Times 2 and 3. Only depression scores changed between Time 2 and 3,
Table 5

*Group A: Time 1 Descriptive Statistics and Correlations Between Measures of Suicidality (N = 90)*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Possible Range</th>
<th>Observed Range</th>
<th>Coefficient α</th>
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<th>2</th>
<th>3</th>
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<td>3</td>
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<td>.77**</td>
<td>.64**</td>
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<td>.43*</td>
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</table>

*Note.* 1 = Beck Depression Inventory; 2 = Beck Hopelessness Scale; 3 = Psychache Scale; 4 = Beck Scale for Suicide Ideation; 5 = Beck Scale for Suicide Ideation-Motivation; 6 = Beck Scale for Suicide Ideation-Preparation; 7 = Attempter status; 8 = Number of previous attempts. Some descriptive statistics and correlations are based on fewer than 90 participants due to missing data. Lifetime attempt data is based only on those who reported a previous attempt.

*p < .05, **p < .01
Table 6

Group A: Time 2 Descriptive Statistics and Correlations Between Measures of Suicidality (N = 90)

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<th>Observed Range</th>
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<th>2</th>
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</table>

\[
M \begin{array}{cccccccc}
18.11 & 7.57 & 28.31 & 8.83 & 2.94 & 5.06 & .22 & .23 \\
\end{array}
\]

\[
SD \begin{array}{cccccccc}
11.95 & 5.01 & 11.57 & 5.09 & 2.98 & 3.22 & .42 & .20 \\
\end{array}
\]

Note. 1 = Beck Depression Inventory; 2 = Beck Hopelessness Scale; 3 = Psychache Scale; 4 = Beck Scale for Suicide Ideation; 5 = Beck Scale for Suicide Ideation-Motivation; 6 = Beck Scale for Suicide Ideation-Preparation; 7 = Attempter status; 8 = Number of previous attempts. Some descriptive statistics and correlations are based on fewer than 90 participants due to missing data. Lifetime attempt data is based only on those who reported a previous attempt. *p < .05, **p < .01
Table 7

*Group B: Time 1 Descriptive Statistics and Correlations Between Measures of Suicidality (N = 56)*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Predictors</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>7</td>
<td>1-∞</td>
<td>1-11</td>
</tr>
</tbody>
</table>

|       |       |       | M | 16.64 | 5.64 | 28.79 | 10.26 | 3.82 | 5.65 | .31 | 2.58 |
|       |       |       | SD | 10.56 | 3.94 | 12.66 | 5.45 | 2.88 | 3.10 | .46 | 2.75 |

Notes. 1 = Beck Depression Inventory; 2 = Beck Hopelessness Scale; 3 = Psychache Scale; 4 = Beck Scale for Suicide Ideation; 5 = Beck Scale for Suicide Ideation-Motivation; 6 = Beck Scale for Suicide Ideation-Preparation; 7 = Attempter status; 8 = Number of previous attempts. Some descriptive statistics and correlations are based on fewer than 56 participants due to missing data. Lifetime attempt data is based only on those who reported a previous attempt. 

*p < .05, **p < .01
Table 8

*Group B: Time 2 Descriptive Statistics and Correlations Between Measures of Suicidality (N = 56)*

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</table>

\[ M \] 17.90 7.33 27.67 8.99 3.01 5.28 .27 2.75
\[ SD \] 12.33 4.87 11.74 6.10 3.07 3.46 .45 2.49

*Note.* 1 = Beck Depression Inventory; 2 = Beck Hopelessness Scale; 3 = Psychache Scale; 4 = Beck Scale for Suicide Ideation; 5 = Beck Scale for Suicide Ideation-Motivation; 6 = Beck Scale for Suicide Ideation-Preparation; 7 = Attempter status; 8 = Number of previous attempts. Some descriptive statistics and correlations are based on fewer than 56 participants due to missing data. Lifetime attempt data is based only on those who reported a previous attempt.

\[ *p < .05, **p < .01 \]
Table 9

*Group B: Time 3 Descriptive Statistics and Correlations Between Measures of Suicidality (N = 56)*

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<td>6.84</td>
<td>3.54</td>
<td>3.45</td>
<td>.43</td>
<td>.79</td>
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</tbody>
</table>

*Note.* 1 = Beck Depression Inventory; 2 = Beck Hopelessness Scale; 3 = Psychache Scale; 4 = Beck Scale for Suicide Ideation; 5 = Beck Scale for Suicide Ideation-Motivation; 6 = Beck Scale for Suicide Ideation-Preparation; 7 = Attempter status; 8 = Number of previous attempts. Some descriptive statistics and correlations are based on fewer than 56 participants due to missing data. Lifetime attempt data is based only on those who reported a previous attempt. *p < .05, **p < .01*


\( t(55) = 2.43, p < .05, \) becoming significantly lower. These results suggest that from Time 1 to Time 3, participants had less suicidal ideation, but were feeling more hopeless.

The current groups’ means and standard deviations for depression, hopelessness, and psychache were similar to those found in other samples of undergraduate students with an attempt history (Flamenbaum & Holden, 2007; Munchua, 2003). Mean total scores for suicide ideation were much lower than those found in inpatient attempters, and slightly lower than outpatients attempters (Beck & Steer, 1991). Means were more similar, albeit slightly lower, than those found in other studies examining university students with an attempt history (DeLisle & Holden, 2005; Flamenbaum & Holden). Lower scores on this scale are appropriate as the current sample included a large percentage of individuals who would be considered suicide ideators, but who had not made a previous attempt. One would expect lower means for ideators because of many items that pertain to actions that are more likely to have been undertaken by someone who has made a suicide attempt (i.e., “Have you ever made any preparation for any attempt to end your life?”).

**Correlations Among Measures of Suicidality**

As can be seen in Tables 5 and 7, at Time 1 these groups rated the predictors as three separate variables, but as highly correlated \( (r = .58 \text{ to } r = .77) \). As is clear from Tables 6, 8, and 9, at Time 2 and 3 the correlations between hopelessness and depression \( (r = .71 \text{ to } r = .74) \), and hopelessness and psychache \( (r = .69 \text{ to } r = .77) \) remained at the same moderately high level. In contrast, the correlations between depression and psychache rose dramatically \( (r = .86 \text{ to } r = .90) \). Most research examining psychache and depression have found correlations between these predictors similar to those found in the
current sample at Time 1 (DeLisle & Holden, 2009). In other work (Munchua, 2003), correlations between these variables approached the level of those in this sample. The presence of high correlations between predictor variables – .8 and .9 are commonly used cutoffs (Mason & Perreault, 1991) – indicates that collinearity may be a problem. The current findings suggest that multicollinearity is present in this sample, and will impact how much independent variability can be accounted for by each predictor in the statistical models. Intercorrelations between main measures for Groups A and B across all times can be found in Appendix B and C.

Test of the Contributions of Depression, Hopelessness, and Psychache to Suicide Ideation

Consideration of Statistical Assumptions

For all subsequent analyses, only the total score from the BSS was used as a dependent variable in the regression analyses. The focus was on this score, because it was a more reliable measure than the subscales of the BSS. Using a more reliable measure was necessary in this study due to the smaller sample size.

To test the assumptions of multiple regression, the normality of each predictor and the outcome variable was assessed by calculating indices of skewness and kurtosis and visually inspecting histograms. A lack of normality was indicated if the ratio of skewness or kurtosis to its standard error was greater than three or less than negative three. At Time 2, all variables were normally distributed with the exception of suicide ideation. This variable was positively skewed. At Time 3, hopelessness and psychache were normally distributed, but depression and suicide ideation were positively skewed. Assumptions of linearity, homoscedasticity, and independence of errors were all confirmed by visual inspection of plots of standardized residual scores versus standardized predicted scores.
Due to the nonnormality of the data, bootstrapping was used to construct confidence intervals around regression coefficients using 5000 resamples to test for significance.

Due to the high multicollinearity between predictor variables and a fairly small sample size, particularly at Time 3, a number of solutions were available. One option that was tested was to attempt to orthogonalize the predictors through a principal components analysis with varimax rotation and, assuming the resultant latent components still maintained their construct validity, use relatively independent component scores instead of highly correlated scale scores as predictors of suicide criteria. This solution was not optimal because, by using this method, approximately 25% of the participants would be dropped from analyses due to missing data. Consequently, for the purposes of this study, one predictor variable was dropped in each regression model.

Data Analyses

To assess the unique contributions of depression, hopelessness, and psychache, the suicide ideation scale was regressed on each of two predictors at a time, and statistically significant standardized regression weights were compared. Therefore, for each group at each time, three separate regression analyses were conducted to compare all combinations of pairs of predictors. The findings from regressions are reported in Tables 10, 11, and 12.

Regression models with psychache and depression entered as factors generally had one of two outcomes. For three of these models, psychache completely residualized the association between depression and suicide ideation. In one model, both predictors contributed significant unique explanatory variance, but psychache had a larger standardized regression coefficient. These results suggest that psychache is a more
Table 10

Regression Weights for Statistically Predicting Suicide Ideation in the High-Risk Sample

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Group A (n = 90)</th>
<th>Group B (n = 56)</th>
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</thead>
<tbody>
<tr>
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<td>Time 1</td>
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<td>.38***</td>
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<tr>
<td>Psychache</td>
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<td>.33*</td>
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</table>

*Note. *p < .05, **p < .01, ***p < .001, two-tailed.*
Table 11

Regression Weights for Statistically Predicting Suicide Ideation in the High-Risk Sample

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Group A (n = 90)</th>
<th>Group B (n = 56)</th>
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</thead>
<tbody>
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</tr>
<tr>
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<td>Hopelessness</td>
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<td>.08</td>
</tr>
<tr>
<td>Psychache</td>
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<td>.53*</td>
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</tbody>
</table>

*Note. *p < .05, **p < .01, ***p < .001, two-tailed.*
Table 12

*Regression Weights for Statistically Predicting Suicide Ideation in the High-Risk Sample*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Group A (n = 90)</th>
<th>Group B (n = 56)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Time 1</td>
<td>Time 2</td>
<td>Time 1</td>
<td>Time 2</td>
</tr>
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<td>4.90</td>
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</tr>
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<td>Hopelessness</td>
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<td>.07</td>
<td>.33</td>
<td>.28*</td>
</tr>
</tbody>
</table>

*Note. *p < .05, **p < .01, ***p < .001, two-tailed.*
important predictor of suicide ideation than is depression. For group B at Time 2, neither depression nor psychache was a statistical predictor of ideation. However, together the two factors accounted for 43% of the variance ($R^2 = .43$). This finding suggests that in this model, dropping hopelessness could not overcome the problems with multicollinearity between depression and psychache.

Regression models with hopelessness and psychache entered as predictors also had one of two outcomes. For these models, either (1) psychache completely residualized the association between hopelessness and suicide ideation, or (2) both predictors contributed significant, unique explanatory variance, but psychache had a larger standardized regression coefficient. These results suggest that psychache is a more important predictor of suicide ideation than is hopelessness. There was no situation in which the association between psychache and suicide ideation was residualized by another predictor, lending support to the notion that psychache is the predictor most associated with suicide ideation.

Regression models with hopelessness and depression entered as factors had one of two outcomes as well. For these models, either (1) depression completely residualized the association between hopelessness and suicide ideation, or (2) both predictors contributed significant, unique, explanatory variance, but depression had a larger standardized regression coefficient. These results suggest that, when not accounting for levels of psychache, depression is a more important predictor of suicide ideation than is hopelessness. Other research utilizing university samples have also found depression to outpredict hopelessness (Munchua, 2003; Rudd, 1990).
Tests of the Contributions of Depression, Hopelessness, and Psychache to Suicide

Ideation Over Time

Data Considerations

To assess whether a change in suicide ideation over time can be accounted for by changes in depression, hopelessness, and psychache, change scores were calculated for the four variables of interest. Although earlier research cautions against the use of change scores (Cronbach & Furby, 1970), more recent work has outlined that there are a number of situations in which the use of change scores is legitimate and preferred to other analyses (Maxwell & Howard, 1981; Zumbo, 1999). Another option was to use the measures from earlier occasions as covariates in analysis. When so many variables are being entered into the regression equation, a much larger sample size is needed to test individual predictors (Tabachnick & Fidell, 2007). Using earlier measures as covariates was not appropriate due to the small sample size, and change scores were used instead. Change scores were calculated by subtracting earlier scores on the variables from later scores. Therefore, positive change scores were indicative of a rise in levels of the variable. Each person had three different change scores for each variable; change from Time 1 to Time 3, from Time 1 to Time 2, and from Time 2 to Time 3.

Data Analyses

The results of the regression analyses using changes scores can be viewed in Tables 13, 14, and 15. Again, due to nonnormality of the data, bootstrapping was used to construct confidence intervals around regression coefficients using 5000 resamples to test for significance. Correlations between all change scores can be found in Appendix D. When examining the results of change scores from Time 1 to Time 2, all of the overall
Table 13

*Regression Weights for Statistically Predicting Change in Suicide Ideation Over Time*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Time 1 to Time 3 (Group B; n = 56)</th>
<th>Time 1 to Time 2 (Group A; n = 90)</th>
<th>Time 2 to Time 3 (Group B; n = 56)</th>
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<tr>
<td></td>
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<td>$R^2$</td>
<td>$R^2$</td>
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<tr>
<td></td>
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<td>.40***</td>
</tr>
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</tr>
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<tr>
<td>∆ Psychache</td>
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</table>

*Note. *p < .05, **p < .01, ***p < .001, two-tailed.*
Table 14

Regression Weights for Statistically Predicting Change in Suicide Ideation Over Time

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Time 1 to Time 3 (Group B; n = 56)</th>
<th>Time 1 to Time 2 (Group A; n = 90)</th>
<th>Time 2 to Time 3 (Group B; n = 56)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R²</td>
<td>b</td>
<td>β</td>
</tr>
<tr>
<td>Intercept</td>
<td>.14*</td>
<td>-1.79</td>
<td>-1.52</td>
</tr>
<tr>
<td>Δ Hopelessness</td>
<td>.33</td>
<td>.29*</td>
<td>.17</td>
</tr>
<tr>
<td>Δ Psychache</td>
<td>.07</td>
<td>.14</td>
<td>.09</td>
</tr>
</tbody>
</table>

Note. *p < .05, **p < .01, ***p < .001, two-tailed.
Table 15

Regression Weights for Statistically Predicting Change in Suicide Ideation Over Time

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Time 1 to Time 3 (Group B; n = 56)</th>
<th>Time 1 to Time 2 (Group A; n = 90)</th>
<th>Time 2 to Time 3 (Group B; n = 56)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>$R^2$</td>
<td>$R^2$</td>
</tr>
<tr>
<td></td>
<td>.19**</td>
<td>.12**</td>
<td>.40***</td>
</tr>
<tr>
<td>Intercept</td>
<td>$b$ -1.63 $\beta$ 1.70</td>
<td>$b$ -1.70 $B$ .33</td>
<td>$b$ .33</td>
</tr>
<tr>
<td>$\Delta$ Depression</td>
<td>$.13$ $.28$</td>
<td>$.10$ $.27$</td>
<td>$.19$ $.40^*$</td>
</tr>
<tr>
<td>$\Delta$ Hopelessness</td>
<td>$.24$ $.21$</td>
<td>$.12$ $.12$</td>
<td>$.36$ $.34^*$</td>
</tr>
</tbody>
</table>

*Note. *$p < .05$, **$p < .01$, ***$p < .001$, two-tailed.*
regression models were significant. However, none of the predictors contributed unique explanatory variance. This finding is likely due to the high multicollinearity between the predictors.

For the changes between Time 1 and Time 3, again, all of the overall regression models were significant. The only model in which an individual predictor had a significant regression coefficient was one in which hopelessness and psychache were entered into the model. In this case, contrary to expectations, only hopelessness contributed significant, unique, explanatory variance to the prediction of changes in suicide ideation.

Regression models using scores from Time 2 to Time 3 were all significant. Psychache completely residualized the association between depression and suicide ideation, but in another regression model, both psychache and hopelessness were statistically significant predictors. In this case, psychache had a larger regression coefficient. Additionally, both depression and hopelessness contributed significant unique explanatory variance, but depression had a higher regression coefficient. Therefore, results support the inference that psychache is the most important cause of suicide ideation between these two times.

Discussion

The present study contributes in several ways to the current understanding of how psychological variables are associated with suicide ideation, and how they can predict suicide risk over time. First, regression models with pairs of predictors were examined at each time point to determine which psychological variable was most strongly associated with suicidality. Each time psychache was entered in the regression model, it was found
to contribute significant, unique, explanatory variance in the prediction of suicide ideation. The only exception to this result was when neither psychache nor depression had significant regression coefficients for Group B at Time 2. In this case, the overall model was significant, and therefore, this finding may be due to the high collinearity between these two variables.

In some of the regression models, the association between suicide ideation and depression and hopelessness was completely residualized by psychache as Shneidman (1993) would have predicted. In other models, however, both predictors were found to contribute significant, unique, explanatory variance. In these instances, psychache always had the larger standardized regression coefficient, suggesting that it is the most important predictor of suicidal ideation. Others have also found psychache to outperform hopelessness and depression in undergraduate (DeLisle & Holden, 2004), forensic (Holden & Kroner, 2003), and community (Holden et al., 2001) samples.

When examining models without psychache, at Time 1 the association between hopelessness and suicide ideation was completely residualized by depression. At Times 2 and 3 both depression and hopelessness were significant statistical predictors, but depression had the higher regression coefficient. Similar to Study 1, this finding suggests that depression is a more important predictor of suicide ideation than is hopelessness. The finding that depression outperforms hopelessness has been shown in other research using university samples (DeLisle & Holden, 2004; Konick & Gutierrez, 2005; Rudd, 1990).

Although the previously discussed regressions suggest that psychache is the most important predictor of suicide ideation, they do not allow for causal inferences. Conclusions about how the psychological variables cause suicide risk by using change
scores are unclear in this study due to a small sample size at Time 3, high multicollinearity between the predictors, and little variability in suicide ideation over the study period. Although all of the overall models that examined change between Time 1 and 2 were significant, none of the individual predictors contributed any significant unique variance. Models with change scores from Times 1 to 3 were also significant, but with very little prediction from the individual factors. This finding suggests that the issue of multicollinearity could not be overcome entirely by dropping one of the predictors.

Regression models with change scores from Time 2 to Time 3 resulted in the most predictive ability. For models of this time period, psychache completely residualized the association between depression and suicide ideation, and had a higher regression coefficient than did hopelessness. These results suggest that psychache is the most important predictor of suicide ideation. The use of change scores in the model suggests that psychache is the most important cause of suicide ideation. Only one other study to date has included psychache in a longitudinal research design. In this case, increases in both psychache and hopelessness were significantly associated with increases in suicidality (DeLisle, 2007).

Looking at hopelessness and depression, results are slightly more equivocal. In their respective models, depression was no longer significant, whereas hopelessness remained significant with the addition of psychache. When depression and hopelessness were entered together, both were significant, but depression had a slightly higher coefficient. Examination of past research reveals contradictory results when comparing depression and hopelessness. Longitudinal research has found hopelessness to be a more important predictor of suicidality and suicide completion (Beck et al., 1985; Brown et al.,
2000; Delisle, 2007), whereas research finding depression to be more important is also mounting (DeLisle & Holden, 2004; Konick & Gutierrez, 2005; Rudd, 1990). Further studies are needed to understand the relationship between these variables and their value in the prediction of suicidality. Due to the high multicollinearity between predictors in this sample, the hypothesis that psychache is the most proximal cause of suicide risk could not be evaluated. Research is needed with more participants and over a longer time period to understand the relationship between the predictor variables and their role in suicide risk.

CHAPTER 4

GENERAL DISCUSSION

Every year in Canada, more than 3,500 individuals take their own lives (Health Canada, 1994), making suicide prevention of extreme importance due to its possible effects on suicidal individuals, and their friends and families. Although prediction of suicide risk represents a challenge to researchers, efforts to better understand and predict who is at risk of taking their own lives is of vital importance. This knowledge will help inform and guide more effective prevention and intervention programs. At present, depression and hopelessness are the psychological variables predominantly used to predict suicide risk. Shneidman (1993) believed that psychache, or psychological pain, is a more important predictor than either depression or hopelessness, leading an individual to suicide when the pain is felt to be unbearable. In recent years, psychache has received an increasing amount of research support as another proximal risk factor for suicide, and one that is potentially more important than either depression or hopelessness.
The present study addressed two major questions: (1) whether psychache or intense psychological pain can statistically predict suicidality beyond the effects of depression and hopelessness in university undergraduates, and in a group of suicide ideators and attempters, and (2) whether a change in suicide ideation over time can be accounted for by changes in psychache, hopelessness, and depression. For this purpose, change scores were calculated from a five-month period to allow stronger causal inferences to be made between the predictors and outcome variable. After the findings of the current study are reviewed, practical implications of this research, as well as limitations and future research directions, will be discussed.

Summary of Findings in Relation to Hypotheses

The hypothesis that psychache would be the dimension most strongly associated with suicidality was supported by the current findings. Regression analyses indicated that for the large nonclinical group of students, psychache was the strongest statistical predictor of all suicidal outcomes, including suicidal ideation, motivation and preparation, as well as attempter status and number of lifetime attempts. Depression and hopelessness did contribute significant unique explanatory variance to the prediction of suicide ideation, suicide motivation, and suicide preparation, however neither emerged as the strongest predictor for any of these criteria. This result is consistent with findings from other university (DeLisle, 2007) and community samples (Holden et al., 2001). For attempter status and lifetime attempts, psychache completely residualized the associations between these criteria and depression and hopelessness. This finding is consistent with Shneidman’s notion that all other factors are only important insofar as their relationship to psychache.
The results of the high-risk sample were less clear due to multicollinearity and the need to drop one predictor in each regression model. However, overall, psychache still appeared to be the most consistent and strongest statistical predictor of suicide ideation. In all models including depression and psychache, psychache either completely residualized the association between depression and suicide ideation or was the stronger statistical predictor. One model was an exception as neither predictor contributed significant variance. The same results emerged in regression models that included hopelessness and psychache. Again, psychache either completely residualized the association between hopelessness and ideation, or was the stronger predictor. The finding that psychache was the strongest statistical predictor of suicide ideation in a high-risk sample is consistent with other research examining groups of attempters and/or suicide ideators (Holden et al., 1998; Munchua, 2003).

Shneidman’s (1993) claim that psychache mediates the relationship between all risk factors, such as depression and hopelessness, was not substantiated. When the suicide criteria were regressed on all three predictors simultaneously (Study 1), depression and hopelessness still accounted for unique variance in suicide ideation, motivation, and preparation. In the high-risk sample (Study 2), a number of regression models still found that depression or hopelessness accounted for unique variance in suicide ideation, even when psychache was considered. A number of other studies have found that psychache does not residualize the associations between other psychological variables and measures of suicidality (Berlim et al., 2003; DeLisle, 2007; Flynn & Holden, 2007; Holden et al., 2001). Overall, these findings suggest that although psychache is an important factor that
should be taken into account when determining suicide risk, it is not the only factor that should be considered.

The second hypothesis, that changes in psychache would be the strongest predictor of changes in suicide ideation, was difficult to evaluate due to the problems with data multicollinearity. The high correlations between the psychological predictor variables at Time 2 and 3, which ranged from $r = .69$ to $r = .90$, likely attenuated the degree of unique explanatory variance in the criteria that could be attributed to any one factor. In many of these analyses, although the overall model was significant, no predictor added any significant unique variance. Again, this finding points to the high multicollinearity in the data that could not be overcome by dropping a predictor. For the models that did show individual prediction, psychache residualized the association between depression and suicide ideation, and had a larger regression coefficient than hopelessness. Again, these results suggest that psychache is at least another, if not more important, cause of suicide ideation than depression and hopelessness. However, contradictory results are found between Time 1 and Time 3, where hopelessness is found to residualize the association between psychache and suicide ideation. Therefore, no definitive conclusions can be drawn from these analyses.

This study is the first to examine psychache in a prospective manner in a high-risk sample of suicide ideators and attempters. One other study examined psychache over time in a nonclinical university student sample (DeLisle, 2007). Results from that study showed that both psychache and hopelessness may be causes of suicidality. Unfortunately, the data in the current study do not allow for strong conclusions on the contributions of changes in depression, hopelessness, or psychache to changes in suicide
ideation. This research will be continued with a larger sample size, and over a longer period of time to attenuate these problems and allow for stronger conclusions. However, results from the other regression analyses and from other research show promise that psychache will once again emerge as the strongest statistical predictor.

Theoretical Implications

The introduction reviewed three theories relevant to psychological predictors of suicide risk, namely Beck’s (1967) cognitive theory of depression, Abramson et al.’s (1989) theory of hopelessness, and finally, Shneidman’s (1993) theory of psychache. Beck postulated that depressed individuals have negative thoughts about themselves, the world, and the future. An individual will contemplate suicide when these thoughts and problems become too unbearable. Abramson et al.’s conceptualization focuses on a more specific subset of depressive symptoms, known as hopelessness as the cause of suicidal outcomes. Abramson et al. posited that suicide is a likely outcome for individuals who have negative expectations about the occurrence of desirable outcomes, and believe that they are helplessness about changing the likelihood of them occurring. These types of cognitions are believed to be a subtype of depression known as hopelessness depression. Finally, Shneidman proposed that psychache, or psychological pain, is the factor most strongly related to suicidal outcomes. He posited that when psychache, caused by unfulfilled psychological needs, becomes too great for individuals to bear, they see suicide as the only means to escape from this pain, by putting an end to consciousness. Shneidman posited that all other factors are secondary, and only related to suicide insofar as their relation to psychache.
Findings from the current studies provided partial support for all three models, but suggest that psychache is the most important predictor of suicide. Although depression, hopelessness, and psychache were all found to be statistical predictors of ideation, motivation, and preparation in the nonclinical sample, psychache was consistently the strongest indicator. Psychache was the only statistical predictor of attempter status and number of lifetime attempts.

Results from the ideator and attempter samples are less clear, due to problems of multicollinearity, and the need to drop one of the predictors in each regression model. However, for all models that included psychache, one of two outcomes occurred: (1) either psychache residualized the association between depression and suicide ideation, or hopelessness and suicide ideation, (2) or both factors were statistical predictors, but psychache had a stronger association. This finding adds further support to Shneidman’s (1993) notion that psychache is the factor most strongly associated with suicidal outcomes. However, Shneidman’s theory that depression and hopelessness are only related to suicidality in their relation to psychache was not fully supported, as these variables often emerged as statistical predictors alongside psychache.

Regression models that included hopelessness and depression found support for both Beck and Abramson’s theory, but favoured depression as a more important predictor. In the high-risk sample in Study 2, depression consistently had a stronger association with suicide ideation, and in some cases residualized the association between hopelessness and suicide ideation. This result is somewhat surprising given that previous research has found hopelessness to outperform depression in the prediction of suicidality (Beck, Brown, & Steer, 1989; Dyer & Kreitman, 1984). However, other research is
emerging favouring depression over hopelessnesss (Munchua, 2003; Reifman & Windle, 1995; Rudd, 1990). It is unlikely that multicollinearity can fully explain this finding as depression residualized the association between hopelessness and suicide ideation at times where the correlation between depression and hopelessness were only moderately high ($r = .58$ to $r = .65$). The strength of these correlations is similar to those found in a study that finds depression and hopelessness to be empirically distinct factors (DeLisle & Holden, 2009). In addition, these lower correlations between depression and hopelessness are not consistent with Abramson et al.’s (1989) claims that hopelessness is a subtype of depression. The hopelessness depression theory has been tested more directly in other research (Reifman & Windle), and has also not supported Abramson and colleagues’ ideas.

The high degree of multicollinearity found between the three predictor variables raises the question of whether or not these variables are truly distinct. In past research, Shahar, Bareket, Rudd, and Joiner (2006) studied a group of severely suicidal young adults and found that depression, hopelessness, and suicide ideation constitute a single depressive syndrome. Psychological pain was not included in their model. In contrast, DeLisle and Holden’s (2009) research showed that depression, hopelessness, and psychache represent three correlated, but separate dimensions. However, their research utilized a nonclinical sample of university students. Therefore, clinical and nonclinical groups may evaluate these variables differently. As individuals’ levels of suicidality become more severe, these predictors may converge into a single psychiatric syndrome. This hypothesis would explain why, in the current study, multicollinearity was a problem in the group of ideators and attempters, but not in the larger group of students. However,
correlations between the predictors were lower for the high-risk sample at Time 1 \((r = .58\) to \(r = .77\)) even though their levels of suicidal ideation were higher. Therefore, it seems that from Time 1 to Time 3, these factors became increasingly related for this sample. To date, the only other study that looked at these three factors in a prospective manner did not find that correlations between predictors increased over time (DeLisle, 2007). Again, these results were found in a nonclinical sample. It may be that for higher-risk groups, as time goes on, these once separate variables begin to consolidate into one dimension of suicidality. Alternatively, this situation may have occurred because of a switch from completing materials on paper in Time 1, to completing them online in Times 2 and 3, or simply as a function of completing the same materials a number of times in a relatively short time frame. Other research has found testing effects with the BDI and other measures of negative mood states, such that participants report lower levels of depression simply as a function of completing the same material twice during a one week interval (Sharpe & Gilbert, 1998). More research is needed to evaluate these hypotheses and to better understand the high multicollinearity found in this group.

Practical Implications

Suicide is one of the 10 leading causes of death in Canada (Health Canada, 1994). Between 1988 and 1992 alone over 17,000 Canadians took their own lives. In addition to completed suicides, parasuicidal behaviour represents a major mental health concern. Research has shown that in introductory psychology classes, about 10% of students report a past suicide attempt (Flamenbaum & Holden, 2007). Even in youth aged 12-16, between 5 and 20% reported suicidal ideation or an attempt in a 6-month period (Joffe, Offord, & Boyle, 1988). The extent of this problem makes clear the importance of
understanding the causes of suicidality. A better understanding of the cause and specific factors that contribute to suicidal outcomes will help inform more effective assessment, prevention, and interventions.

Assessment

One of the earliest steps to preventing suicide is the proper identification of who is at risk. A number of assessment tools have been developed, including the BDI, the BHS, and the BSS and are currently being used in risk assessment. However, no single instrument has been found to predict suicide risk without error (Bisconer & Gross, 2007). The present research suggests that the addition of the Psychache Scale to risk assessment, along with measures of depression and hopelessness, may serve to improve the accuracy of risk prediction in sample of attempters, ideators, and nonclinical populations. Research has found psychache to be an effective statistical predictor of suicidality among mood disordered patients (Berlim et al., 2003), prison inmates (Holden & Kroner, 2003), and individuals with an attempt history (Holden et al., 2001). Further longitudinal work is needed to understand the relationship between psychache, hopelessness, and depression and their ability to predict future suicide attempts and completed suicides.

Intervention

Psychache, and unfulfilled psychological needs, represent a new idea for how to treat suicidal individuals. Because psychache is thought to be maintained by unfulfilled needs, Shneidman (1998) believed that to reduce an individual’s likelihood of suicide, one has to first address the needs of that particular person. He believed that if you address, and mollify these needs, the person will choose to live. Shneidman’s recommendations for intervention are informed by his personal experience with patients,
but there is no empirical support for this type of therapy. In addition, research on unfulfilled needs as the cause of psychache has found mixed results (Davie, 2005; Flamenbaum & Holden, 2007). The study of psychache and its causes is still relatively new and much remains to be known before an effective therapeutic approach can be formed.

The high degree of overlap between the three predictor variables in the at-risk groups suggest that targeting depression, hopelessness, or psychache may lead to an overall reduction of distress. Therefore, whether you use cognitive-behavioural therapy (Beck, 1993) to target depression, or other treatments to increase hope and decrease mental pain, an individual’s suicide risk is likely to be reduced. However, it may be helpful to know and understand the driving force behind an individual’s suicidal wishes, so that the most important cause of risk can be better targeted.

Limitations

This research has a number of limitations based on the obtained sample, the materials used, and the research design. Both studies used a sample drawn from a population of undergraduate students in which there were very few male participants. Therefore, the generalizability of the results is limited, and may not apply to clinical or other populations. Another consequence of using first-year university students is that they are relatively young and only a small number of individuals reported a history of a suicide attempt. The proportion of individuals in this sample who reported having made an attempt in the past was even smaller than that found in other research utilizing university samples (DeLisle & Holden, 2009; Flamenbaum & Holden, 2007).
Another limitation is that most of the regression analyses were from a cross-sectional design. Therefore, causal inferences cannot be made for the results of Study 1 and part of those from Study 2. However, the regressions using change scores in Study 2 could be used to infer causation more strongly, because they examined changes in levels of suicidality over time. Unfortunately, because one predictor had to be dropped from each regression equation and multicollinearity still did not allow for significant regression coefficients, the predictive value of the factors could not be properly assessed.

Finally, suicidality was studied in terms of suicide attempts, suicide ideation, suicide motivation and suicide preparation. Therefore, the findings of this research may not generalize to actual suicide completions. Although a history of suicide attempts and suicidality are substantive risk factors for later suicidal behaviour (Joiner et al., 2005), not everyone who dies by suicide has made a previous attempt. Research has shown that between one quarter and one third of youth suicides had made a previous attempt. However, the risk of attempted suicide has been found to increase 3 to 17 times in those with prior suicidal behaviour (Gould, Greenberg, Velting, & Shaffer, 2003). Further research is needed to determine whether suicidal behaviours and completions fall on a continuum, or if they represent distinct categories with different predictors of risk. Although the suicide criteria used in this study are not perfect proxies for completed suicides, thoughts of killing oneself and actually attempting to do so are serious mental health concerns that, in and of themselves, warrant research attention.

Future Research

The current study is the first to examine psychache in a group of suicide ideators and attempters in a prospective manner. A prospective design is the first step to
understanding the links between psychache, hopelessness and depression over time, and how they may cause suicidal outcomes. However, more research of this type is needed with a larger sample and over a longer period of time. These two modifications should help with the problems of multicollinearity found in this study.

Continuing with longitudinal research will also make clearer the link between psychache and completed suicides. Although parasuicidal behaviours are serious mental health concerns and a link to suicide, they are still only proximate measures. Beck and his colleagues have conducted a number of studies with a large number of participants, followed for up to 20-years to understand the link between psychological variables and completed suicide (Brown et al., 2000). Further research of this type that includes psychache as a predictor will provide a clearer understanding of how feelings of psychache, hopelessness, and depression are implicated in suicide.

There are a number of other variables that have been shown to relate to suicidality. For example, research has shown that negative life events and low social supports are predictors of suicide risk (Heikkinen, Aro, & Lonngvist, 1994). It has been shown that social support mediates the effects of stress on suicidality (Clum & Febbraro, 1994) and a large review found negative life events to be a precipitating factor for suicide, whereas social support may be a protective factor (Heikkinen, Aro, & Lonngvist, 1993). Future research should examine how negative life events relate to psychache, and whether social support may mediate the effect of other variables on psychache.

Empirical support for psychache is mounting, but its generalizability must still be established. The majority of research on psychache has examined university students. Some research has used nonclinical samples (DeLisle & Holden, 2009), whereas others
have looked at higher-risk university students with an attempt history (Flamenbaum & Holden, 2007; Holden et al., 2001). However, students still represent a relatively healthy population, and research with individuals with more serious mental illness, such as psychiatric inpatients, is warranted. Some research that has been conducted with other populations, such as prison inmates (Holden & Kroner, 2003), suicidal inpatients (Orbach et al., 2003) and mood disordered outpatients (Berlim et al., 2003) have utilized a measure of psychological pain, but more research with other clinical populations is needed.

More research with severely suicidal groups is also warranted to gain a better understanding of the relationship between depression, hopelessness and psychache. As discussed earlier, research suggests that in highly distressed groups, depression, hopelessness, and suicide ideation may merge into one depressive syndrome (Shahar et al., 2006). However, research with nonclinical groups has found depression, hopelessness, and psychache to be empirically distinct factors (DeLisle & Holden, 2009). Although the current research suggests that these variables may converge into one dimension for some groups, more research with high-risk groups is needed to disentangle these disparate findings.
CHAPTER 5

CONCLUSIONS

This research made a number of important contributions to knowledge in the field of suicidology:

1. In a nonclinical group, depression, hopelessness, and psychache are all statistical predictors of suicide ideation, suicide preparation, and suicide motivation. However, psychache is consistently the strongest indicator of suicidality.

2. In higher-risk groups of suicide ideators and attempters, depression, hopelessness, and psychache are all statistical predictors of suicide ideation. Again, psychache is consistently the strongest predictor, and depression is a stronger predictor than is hopelessness.

3. In higher-risk groups, depression, hopelessness, and psychache are highly correlated, and may converge into one dimension. Further research is needed to understand the relationship between these variables.

4. Longitudinal research with more participants and over a longer study period is needed to understand the psychological causes of suicidal outcomes.
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Appendix A

Materials
Letter of Information

A Prospective Study of Psychache and its Relationship to Suicidality

This research is being conducted by Talia Troister, under the supervision of Dr. Ronald R. Holden of the Queen’s University Department of Psychology.

This research investigates how psychological factors relate to suicidality. Through this research, it is hoped that people who are at relative risk for self-harm may be understood, identified, and treated more effectively. You will be asked to complete a series of on-line questionnaires that should take less than 30 minutes to complete. You can choose to receive either one Psyc100 credit or $10 for your participation. You will also be asked about being contacted again for another session in 1 year to complete the same materials and receive the same compensation again. If you agree to participate again, you will be asked to provide a current email address where you can be contacted.

Although this research deals with a highly sensitive issue, there are no known increases in risk in participating in this study. However, should the remembering of your experiences lead you to feel distressed, and you would like to speak confidentially to someone about your thoughts or feelings, I am trained to assess the situation further, and will consult Dr. Holden. I can provide you with a list of appropriate resources, if necessary [i.e., Student Counselling Centre, 613-533-2506; 24-hour crisis line, 613-544-4229; Hotel Dieu Emergency (Psychiatry), 613-546-1240; Distress Centre, 613-544-1771, Canadian Mental Health Association, 613-549-7027]. If you do contact me or my supervisor and indicate that you are at immediate risk, we will attempt to act to ensure your safety.

There is a possibility that you may feel uncomfortable with the kind of information we ask of you. You are free to stop participating at any time without any penalty or effect on your academic standing at Queen’s University and, if you wish, any data you have supplied will be deleted. It would be greatly appreciated if you would answer all questions as honestly as possible. However, you should not feel obliged to answer any questions that you find objectionable or that make you feel uncomfortable.

All information gathered in this research is kept confidential and is used only for research purposes. Only the research supervisor and the students in the supervisor’s laboratory, who may access this data for future use, will see your responses. The data will be stored in a secure area in a locked office. Any publications or presentations at scientific conferences based on this research will be of general findings only, and will not reveal personally identifying information.

If you have questions about this research, here are several sources you may contact:
a) Myself, Talia Troister (phone: 613-533-2346; email: psycpat@queensu.ca)
b) My supervisor, Dr. Ronald R. Holden (phone: 613-533-2879; email holdenr@queensu.ca)
c) The Incoming Head of the Department of Psychology, Dr. Rick Beninger, at Queen’s University (613-533-2486, email: beninger@queensu.ca)
d) The Chair of the Queen's University General Research Ethics Board, Dr. Joan Stevenson, (613-533-6081, email: chair.GREB@queensu.ca).

Suicidality is a highly sensitive issue for individuals, their families, and Canadian society. Thank you for being willing to share your experiences.

Sincerely,
Talia Troister
Consent Form

I have volunteered to participate in the study titled, A Prospective Study of Psychache and its Relationship to Suicidality.

I consent to the previously stated information and understand what is required for participation in the study. I understand that I will be seated at a personal computer and will complete a number of questionnaires. I understand that there is a possibility that I may feel uncomfortable with the kind of information asked. I understand that my participation in the study is completely voluntary and that I am free to withdraw at any time without penalty. I also understand that my confidentiality will be protected throughout the study, and that the information I provide will be available only to researchers with scholarly interests in psychache and suicidality.

Should I have further questions I understand that I can contact any of the following individuals: Talia Troister, psycpal@queensu.ca, 613-533-2346, Dr. Ronald Holden, holdenr@queensu.ca, 613-533-2879, the Incoming Head of the Department of Psychology, Dr. Rick Beninger, 613-533-2486, email: beninger@queensu.ca, or the Chair of the General Research Ethics Board, Dr. Joan Stevenson, (613) 533-6081, email: chair.GREB@queensu.ca.

  o Yes I agree to participate
  o No I do not want to participate
Questionnaire 4

The Psychache Scale

The following statements refer to your psychological pain, NOT your physical pain. By checking the appropriate statement, please indicate how frequently each of the following occurs.

1. I feel psychological pain
   - Never
   - Sometimes
   - Often
   - Very Often
   - Always

2. I seem to ache inside
   - Never
   - Sometimes
   - Often
   - Very Often
   - Always

3. My psychological pain seems worse than any physical pain.
   - Never
   - Sometimes
   - Often
   - Very Often
   - Always

4. My pain makes me want to scream.
   - Never
   - Sometimes
   - Often
   - Very Often
   - Always

5. My pain makes my life seem very dark.
   - Never
   - Sometimes
   - Often
   - Very Often
   - Always

6. I can’t understand why I suffer.
   - Never
   - Sometimes
   - Often
   - Very Often
   - Always

7. Psychologically, I feel terrible.
   - Never
   - Sometimes
   - Often
   - Very Often
   - Always

8. I hurt because I feel empty.
   - Never
   - Sometimes
   - Often
   - Very Often
   - Always
9. My soul aches
   - Never
   - Sometimes
   - Often
   - Very Often
   - Always

Please continue this inventory using the following scale:

10. I can’t take my pain any more
    - Strongly Disagree
    - Disagree
    - Unsure
    - Agree
    - Strongly Agree

11. Because of my pain, my situation is impossible
    - Strongly Disagree
    - Disagree
    - Unsure
    - Agree
    - Strongly Agree

12. My pain is making me fall apart.
    - Strongly Disagree
    - Disagree
    - Unsure
    - Agree
    - Strongly Agree

    - Strongly Disagree
    - Disagree
    - Unsure
    - Agree
    - Strongly Agree
Demographic Sheet

Have you ever attempted suicide?
   o Yes
   o No

How long ago was your most recent attempt?

____________________________________

How did you attempt to kill yourself in this attempt?

__________________________________________

How intent were you on killing yourself in this most recent attempt?
   o Not very intent
   o Somewhat intent
   o Moderately intent
   o Quite Intent
   o Extremely intent

How many suicide attempts have you made in your entire lifetime?

____________________________________
Comment Sheet

Comments? (If there are any comments of experiences you would like to add, please feel free):
Debriefing Form

Suicide prevention is an important public health concern in our society. By conducting this research we hope to discover more about the factors involved in suicidality. Identifying psychological factors that can predict suicide risk is an essential component in suicide prevention as these variables are amenable to change. Individuals who have made a suicide attempt in the past represent a unique group to study longitudinally. The purpose of the current study was to investigate how hopelessness, depression, and psychological pain are related to suicidality, in a prospective manner. In future research, findings from this data will be extended by collecting additional data from students in future undergraduate classes. Enhanced understanding of these variables may lead to more appropriate recognition of and intervention for suicidal individuals.

We appreciate you taking the time and effort to share your experiences with us for this study. If the recounting of your experiences has left you to feel distressed and you would like to speak to someone in confidence about your thoughts or feelings, or you would like more information on suicide, you are strongly encouraged to contact your local health practitioner (e.g. your physician). Alternatively, please contact any of the following resources available to you in Kingston:

Student Counselling, Queen’s University………………………………………613-533-2506
Distress & Information Line, TALK………………………………………613-544-1771
Distress Centre, Frontenac Mental Health Services………………………….613-544-4229
Hotel Dieu Emergency (Psychiatry)………………………………………613-546-1240
Canadian Mental Health Association………………………………………613-549-7027

If you have any further questions about this research please contact Talia Troister (psycpal@queensu.ca, 613-533-2346), Dr. Ronald R. Holden (holdenr@queensu.ca, 613-533-2879) or the Incoming Head of the Department of Psychology, Dr. Rick Beninger (613-533-2486, email: beninger@queensu.ca).

Thank you for helping us with this project—your time is much appreciated.

If you have questions about your rights as a research participant, you should contact the Director Chair of the Queen's University General Research Ethics Board, Dr. Joan Stevenson, (613) 533-6081, email: chair.GREB@queensu.ca.

If you are interested in this area of research, you may wish to read the following references:


### Appendix B

**Intercorrelations of Main Measures at Time 1 and Time 2 (Group A; N = 90)**

<table>
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*Note.* All correlations are significant at the 0.01 level (2-tailed). Some correlations are based on fewer than 90 participants due to missing data. 1 = Time 1 measures; 2 = Time 2 measure. BDI = Beck Depression Inventory-II; BHS = Beck Hopelessness Scale; PS = Psychache Scale; BSS = Beck Scale for Suicide Ideation.
Appendix C

*Intercorrelations of Main Measures at Time 1, Time 2, and Time 3 (Group B; N = 56)*

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*Note.* All correlations are significant at the 0.01 level (2-tailed). Some correlations are based on fewer than 56 participants due to missing data. 1 = Time 1 measures; 2 = Time 2 measure; 3 = Time 3 measure. BDI = Beck Depression Inventory-II; BHS = Beck Hopelessness Scale; PS = Psychache Scale; BSS = Beck Scale for Suicide Ideation.
Appendix D

**Intercorrelations of Change Scores of Main Measures (Group A; N = 90, Group B; N = 56)**

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*Note.* *p* < .05 and **p** < .01, two-tailed. Some correlations are based on fewer than 90 or 56 participants due to missing data. 13 = Change from Time 1 to Time 3 (Group B); 12 = Change from Time 1 to Time 2 (Group A); 23 = Change from Time 2 to Time 3 (Group B). BDI = Beck Depression Inventory-II; BHS = Beck Hopelessness Scale; PS = Psychache Scale; BSS = Beck Scale for Suicide Ideation.