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AN INTEGRATED COGNITIVE-AFFECTIVE MODEL OF SUICIDAL THINKING AND BEHAVIOR

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AN INTEGRATED COGNITIVE-AFFECTIVE MODEL OF SUICIDAL THINKING AND BEHAVIOR

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Abstract

Despite a growing body of research, a comprehensive understanding of suicide remains elusive. The current dissertation involved the development of an integrated cognitive affective theory of suicidal thinking and behavior, and the initial assessment of components of this theoretical model in three separate, but related studies. In Study 1, the integrity of the model was assessed in a sample of 397 (83 male and 314 female) undergraduate students. The resulting fit indices (CFI=.87; GFI=.90; RMSEA=.09) of the structural equation modeling (SEM) analysis indicated an adequate fit between the hypothesized model and the data in the sample, with the model accounting for 90% of the variance. The SEM results indicated that rumination and negative affect directly impacted both cognitive distortions and cognitive deficits. Cognitive distortions then had a direct impact on the development of suicide ideation, whereas cognitive deficits had an indirect impact on the development of ideation, through their reciprocal relationships with cognitive distortions, as well as with rumination and negative affect.

In the interest of parsimony, a simplified model, in which cognitive distortions and cognitive deficits were included, but affect and rumination were omitted, was also assessed. The resulting fit indices (CFI = .98; GFI = .98; RMSEA = .05) indicated a better fitting model than the initial model, with the simplified model accounting for 98% of the variance.

In Study 2, the relationships among the components in the model were further assessed in a community sample of 25 non-ideators, 25 ideators, and 11 recent suicide attempters. Patterns of correlations between the variables in the model paralleled those found in Study 1. Further, the components of the model varied across the suicide continuum as predicted by the model. Suicide ideation, cognitive distortions, and negative affect were significantly higher in ideators than in non-ideators, and higher in recent attempters than in ideators. Positive affect, in contrast, decreased significantly across these 3 groups. Ideators reported significantly higher levels of rumination than

did non-ideators, but no significant differences in ruminative tendencies were noted between ideators and attempters. Between group differences in cognitive deficits varied depending on the deficit in question. Avoidant problem-solving was significantly higher in ideators than non-ideators. Although avoidant problem-solving increased across the entire continuum, between-group differences for ideators and attempters were not significant. Cognitive rigidity also increased across the entire continuum, and was significantly higher in attempters than in non-ideators. Self-reported problem-solving ability did not differ appreciably between any of the groups. Overall, compared to cognitive deficits, cognitive distortions demonstrated much stronger and more consistent relationships with suicide ideation and the severity of recent suicide attempts. As such, the findings of Study 2 provided further support for the relationships in the proposed model.

Study 3, which was exploratory in nature, involved conducting psychological autopsy interviews with the next of kin of 4 individuals who had died by suicide, and analyzing the content of their suicide notes for evidence of affect, rumination, cognitive distortions and cognitive deficits. The results of Study 3 indicated that high levels of negative affect and cognitive distortions were evident in the thinking and behavior of fatal suicide attempters in the month prior to the suicide. Perhaps due to the process-oriented nature of rumination and cognitive deficits, there was less evidence of these variables in both the interviews and the suicide note analysis. In general, the results of Study 3 indicated that affect, cognitive distortions and to a smaller degree, cognitive deficits may have utility for understanding fatal suicide attempts as well.

A secondary goal of the current dissertation involved assessing the utility of the components in the model as predictors of suicide ideation. In Study 1, hopelessness was a significant predictor of suicide ideation, but ambivalence, rumination and negative affect exhibited predictive utility above and beyond hopelessness. These findings were replicated in Study 2. Specifically, hopelessness significantly predicted suicide ideation, but the addition of ambivalence

and negative affect (self-directed anger) significantly enhanced the prediction. In Study 2, relative to the severity of intent in recent suicide attempters, the results of the regression analysis indicated that hopelessness was the only significant single predictor. These findings were discussed in terms of the cognitive-affective state that was associated with ideators and attempters in the current studies. Further, the limitations of the current studies were discussed, as were contributions, implications and future directions.

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Foreword

Over the past 15 years, I have been actively involved in the bereavement support program, offered through the Canadian Mental Health Association (London-Middlesex branch). My ongoing involvement has included facilitating bereavement support and healing groups for suicide survivors, those individuals who have lost a loved one to suicide. As facilitator of these support groups, I have witnessed the shock, the pain, and the confusion that suicide leaves in its wake. Survivors, while attempting to adjust to the tragic and untimely loss of their loved one, typically struggle with understanding the death. In attempting to assist survivors in their quest to understand the suicide, I have often consulted the suicidology literature. In so doing, I have been consistently disappointed with the apparent lack of comprehensive theories of suicide; such little information to answer so many pressing questions.

Over the past 15 years, as I have facilitated these suicide support groups, hundreds of survivors have openly recounted not only the deaths, but also the lives, of their loved ones. Each life was special and unique. Each life ended tragically and prematurely with suicide.

Each suicide emphasizes, yet again, the critical importance of suicidology research. Such research is not only important for understanding suicide, but may also have important implications for preventing these tragic and untimely deaths.

Dedication

I would like to dedicate this dissertation to all survivors of suicide –

those individuals who, bereaved by suicide,

are left to struggle through the pain of such tragic loss,

with so many questions and so few answers....

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CHAPTER 1: GENERAL INTRODUCTION

Every year thousands of North Americans end their own lives. Information obtained from the Statistics Canada mortality database indicated that 3,650 and 3,765 suicidal deaths were reported in Canada for 2002 and 2003, respectively. Information obtained from the National Institute of Mental Health, indicated that the American suicide rate was approximately 32,000 for these same periods. These figures are staggering, and represent a tragic and untimely loss of life.

Further, suicide occurs across the entire lifespan and is the leading cause of death in certain age groups. In 1998, suicide was the leading cause of death for women aged 30 to 34, and for men aged 25 to 29, and 40 to 44. For children and youth, aged 10 to 24, suicide was the second leading cause of death for both sexes in 1998 (Langlois & Morrison, 2002). Suicide at any point in the lifespan is especially tragic, given that many of these untimely deaths are potentially preventable with appropriate identification and intervention.

Despite the large body of empirical research that has been devoted to identifying the risk factors associated with suicidal behavior, a complete understanding of the etiology of suicide remains elusive (Joiner, Brown, & Wingate, 2005). As will be discussed throughout this introduction, the majority of the research which has investigated the etiology of suicide has involved the identification of isolated risk factors that predispose an individual to suicidal behavior. In general, the literature appears to lacks integrative process theories of suicide. This is not to say that explanatory models of suicidal behavior have not been proposed. However, the etiological theories that have been forwarded are incomplete, as they typically involve the integration of only a few of the relevant variables and processes that are associated with suicidal behavior. Given this limitation, the primary goal of this thesis was to test the components of an integrated process model of suicidal thinking and behavior.

Valid theoretical models of suicide are not only important for understanding the phenomenology of suicide, but also have important implications for the prevention of self-destructive behavior. There is a general consensus in the literature that suicide attempts are particularly difficult to accurately predict (Melton, Petrila, Poythress, & Slobogin, 2007). This predictive difficulty has been attributed at least in part to the fact that suicide is low base line behavior. It has also been suggested though that an inadequate suicidology knowledge base has been an obstacle in terms of suicide prevention (Heisel, & Duberstein, 2005).

As such, valid theoretical models of suicide may also have important implications for the prevention of self-destructive behavior. In particular, an understanding of the etiology of suicide is a necessary prerequisite for the development of valid and reliable suicide assessment measures. Such measures are an important and essential component of crisis assessment and intervention. Until researchers can develop and validate comprehensive theories of suicide, and further apply this knowledge to guide the development of measurement instruments, the prediction of suicidal behavior will remain an imprecise science. Given that suicide is such an obvious and needless loss of life, coupled with the financial and interpersonal cost of suicide for the survivors in particular, and for society in general, it is somewhat surprising that researchers have not placed a higher priority on the development of a comprehensive and integrated etiological theory of suicide. The present research represents a step in this ongoing process.

Prior to delineating the proposed theoretical model to be validated in this thesis, important findings will be summarized and a brief review of extant theories of suicidal thinking and behavior will be presented and critiqued. Limitations in the available suicidology research also will be discussed with relevance to the current study.

Suicidology Nomenclature

Suicide is a complex behavioral phenomenon which includes not only suicidal thinking, but also self-destructive acts. With the goal of facilitating diagnosis and research related to suicidal behavior, an integrated task force for the National Institute of Mental Health [NIMH] Center for Suicide Prevention has recommended that suicide be treated as three distinct classes of behavior including suicidal thinking, attempted suicide, and completed suicide (Beck, Davis, & Frederick, 1972). For the purpose of the current research, these three terms have been defined in a manner that is consistent with the definitions proposed by O'Carroll, Berman, Maris, Moscicki, Tanney, and Silverman (1996). In the current research, *suicide ideation* will refer to O'Carroll and associates' concept of suicidal thinking, defined as "any self-reported thoughts of engaging in suicide-related behavior" (O'Carroll et al., 1996, p. 247). A *suicide attempt* was defined as "potentially self-injurious behavior with a nonfatal outcome, for which there is evidence (either explicit or implicit) that the person intended at some (nonzero) level to kill himself/herself' (O'Carroll et al., 1996, p. 247). In the current dissertation, *suicide completion* will refer to O'Carroll and associates' concept of suicide, which is defined as "death from injury, poisoning, or suffocation where there is evidence (either explicit or implicit) that the injury was self-inflicted and that the decedent intended to kill himself/herself" (O'Carroll et al., 1996, p. 246–247). It should also be noted that, for the purpose of the current research, a distinction is made between suicide attempt and suicide gesture, with the latter referring to an intentional act or behavior that is associated with low lethality and no intent to die.[1]

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1. In the relevant literature there are ongoing discussions related to redefining the nomenclature related to suicidology. (For a more complete review see Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007). The terms suicide ideation, suicide attempt, and suicide completion were utilized in the current dissertation not only because they are succinct and easier to read, but also because the redefinition of the suicidology nomenclature is ongoing.

Suicidal Thinking and Behavior as a Continuum

Suicide ideation, suicide attempts, and suicide completion differ not only on the level of intent, and lethality, but also on the outcome (Hatton and McBride-Valente, 1984). There is a growing body of research that supports the notion that there are other clear differences among these three groups. One apparent difference across these groups is the prevalence of the behavior in question. Suicidal ideation is not a rare phenomenon. In fact, researchers have estimated that within the general population, between 2.1% and 18.5% (Weissman et al., 1999) of respondents had at some time seriously considered committing suicide. In the general population, estimates of the lifetime incidence of suicide attempts range from .7% to 5.9% (Weissman et al., 1999) depending upon the demographic characteristics of the group being sampled. Clearly, not all individuals who think about suicide actually act on these thoughts, nor do all individuals who attempt suicide die as a result of the attempt. Obviously these groups differ along some important dimensions.

Some of these differences are quantitative in nature. For example, researchers have consistently found a positive correlation between levels of hopelessness and degree of suicide risk, with higher levels of hopelessness associated with increasing levels of suicide intent and fatal attempts (Boergers et al., 1998; Kumar & Steer, 1996; Topol & Reznikoff, 1982). Researchers have also determined that pessimism, as measured by negative thinking and appraisals, is not only higher in ideators than in non-ideating controls (Goldney, Winefield, Saebel, Winefield, &, Tiggeman, 1997), but is also higher in attempters than ideators, and higher in completers than attempters (Beck, Steer, Kovacs, & Garrison, 1985). Thus, researchers have found a positive relationship between the degree of both hopelessness and negative appraisals and the individual's risk of suicidal behavior, with greater severity associated with higher proportions of completed suicides. That is, as thinking becomes more negative and hopeless, the individual is more likely to

move from merely thinking about suicide to actually acting on suicide ideation and dying as a result of the attempt.

Researchers have also found that suicide ideators, attempters, and completers differ on a number of affective dimensions. Most notably, researchers have found that negative affect, especially self-directed anger (Horesh et al., 1997; Simonds, McMahon, & Armstrong, 1991) increases with increasing risk of suicidal behavior.

When considered together, these findings suggest that suicide ideators, attempters, and completers differ in numerous ways. These behaviors are not only associated with different prevalence rates, but also differ along a number of important cognitive and affective dimensions. These findings support the importance of differentiating among these three groups when studying suicidal thinking and behavior. Despite the obvious importance of this distinction, many suicide researchers continue to treat all suicidal thinking and behavior homogeneously. Consequently, in the present study, a distinction has been made between these three groups.

Review & Critical Analysis of Existing Explanations of Suicide

Isolated Risk Factors as Predictors of Suicidal Behavior

A major limitation of extant suicidology research is the tendency of researchers to explain suicidal thinking and behavior in terms of risk factors that are associated with an increased risk of suicidal behavior. For example, certain demographic characteristics, including age, ethnicity, gender, marital status, and socioeconomic status have often been considered predictors of suicidal behavior (Allen, 1984; Maris, 1992a, 1992b; Smith, Mercy, & Conn, 1988). Incidence rates do tend to be higher amongst individuals who are white, separated (Kposowa, 2000; Kreitman, 1988) and/or of lower socioeconomic status (Duberstein, Conwell, Conner, Eberly, & Caine, 2004; Van Ryn & Fu, 2003). Males, especially those aged 20 to 24 and those over 75, have particularly high suicide rates compared to the general population (Statistics Canada, 2006).

Compared to prevalence in the general population, the incidence of suicide is also disproportionately higher among groups of individuals who have been diagnosed with a psychological disorder. Estimates range from 11% to 50% for individuals with a diagnosis of substance abuse, depending on the type of substance and the number of comorbid diagnoses (Cherpital, 1994; Murphy, Wetzel, Robins, & McEvoy, 1992; Kendall, 1983). A large scale multicultural study undertaken by the World Health Organization (Sartorius, Jablensky, Korten, et al., 1986) reported that suicide is the leading cause of death for individuals with schizophrenia, with an estimated 13% of these individuals dying by their own hand (Caldwell & Gottesman, 1990). A more recent reexamination indicates that the suicide mortality rate for individuals with schizophrenia is actually closer to 5% (Palmer, Pankratz, & Bostwick, 2005). Researchers have also estimated that 9.7% of all suicides occur in individuals who have been diagnosed with schizophrenia (Phillips, Yang, Li, & Li, 2004). Whereas suicide attempts have generally been higher in females, the incidence of completed suicide is typically higher in males (Canetto & Lester, 1995; Langlois & Morrison, 2002; Wunderlich, 2001).

Joiner, Conwell, Fitzpatrick, Witte, and Schmidt (2005) have noted that past suicide attempts predict future suicide attempts. Although past suicide attempts have some utility for predicting future suicide attempts, it is also true that not all individuals who make a non-fatal suicide attempt will make subsequent attempts (Joiner et al., 2005).

Citing the positive relationship between these risk factors and an increased rate of suicidal behavior, Maris (1992a) has recommended that suicide risk may be assessed on the basis of these demographic characteristics. The predictive utility of these demographic variables is limited, as they account for only a very small amount of the variance in suicidal behavior even when combined (Ranieri, Steer, Lavrence, Rissmiller, & Beck, 1987). Further, although these characteristics may

have some limited utility for predicting suicidal behavior, they do not provide a framework for understanding the development of suicidal behavior.

Ingram and associates (Ingram, Odom, & Mitchusson, 2004; Ingram & Siegle, 2002) have distinguished between risk and vulnerability, and this distinction is relevant to the current discussion. Specifically, these authors have suggested that the presence of risk factors indicates an increased probability of a disorder or behavioral phenomenon, but has no utility for understanding the underlying causal mechanisms. In contrast, vulnerability refers to the etiological processes of a given disorder (Ingram et al., 2004; Ingram & Siegle, 2002). Applying this risk-vulnerability distinction to the current discussion, it could similarly be argued that although identified risk factors, such as gender, allow the prediction of suicidal behavior, they do not provide a means of understanding the development of suicidal thinking or behavior. Given these limitations, it is clear that isolated risk factors are not adequate predictors of suicidal behavior.

A few authors have moved beyond explaining suicidal behavior in terms of risk factors, and have proposed theories of suicide that involve the combination of several of these risk factors. Even fewer writers have proposed theories that integrate both risk factors and central process mechanisms. As will be demonstrated in this review, there is an apparent lack of integrated process theories of suicide. Examples of extant theories of suicide will now be presented and reviewed.

Considering some of the limitations that are commonly associated with the available theories of suicide, a list of criteria was established for evaluating each of the extant theories of suicide. According to these criteria, a laudable theory of suicide should be concise, clearly defined, comprehensive, integrated, and consistent with empirical findings. Further, a useful theory of suicidality should allow for the differentiation among suicide ideation, suicide attempts, and suicide

completion, and provide a framework for understanding the development of thinking and behavior along the suicide continuum. Finally, a good theory should be testable.

Researchers have reported several cognitive and affective factors that are associated with an increased risk of suicidal behavior. These factors are summarized in a table that is presented in Appendix A. An understanding of these factors is important because any potentially valid etiological theory of suicide should include these factors, or at the very least provide a means of explaining these substantiated findings. These findings will be taken in consideration when reviewing and evaluating extant theories of suicidal thinking and behavior. Before reviewing each theory individually, a number of limitations and criticisms that apply to the majority of the etiological theories are presented. For the sake of clarity, these limitations will be summarized here and will not be repeated during each theoretical evaluation.

First, there has been a general tendency on the part of researchers to neglect to define relevant terms and definitions, and to treat suicide ideators and attempters as one homogeneous group. As previously discussed, despite documented differences among ideators and attempters, researchers have often failed to differentiate between these two groups, making it difficult to develop a complete understanding of the differences among suicidal ideation and suicide attempts. In addition, researchers (e.g., Hewitt, Norton, Flett, Callander, & Cowan, 1998; Schotte & Clum, 1987; Williams, 1986) do not typically compare factors that differ among ideators, attempters, and completers in the same study. As such, it is also difficult to determine which factors clearly distinguish between the presence and absence of suicidal ideation, attempts, and completion.

Another limitation of published studies in the area of suicidology involves a failure on the part of researchers to consistently provide information on the differential diagnoses of the samples used in the studies. Research has generally found that the risk of suicide increases with increasing levels of psychiatric symptomatology (Van Gastel, Schotte, & Maes, 1997) and with the presence

of multiple comorbid diagnoses (Roy, Thompson, & Kennedy, 1983). Considered together, these methodological limitations make it difficult to compare the published findings and to draw any meaningful conclusions regarding differences across the suicide continuum. There is an apparent need for researchers to apply more rigorous and controlled methodology to the study of suicidality.

Mental Illness as a Cause of Suicide

Chynoweth, Tonge, and Armstrong (1980) have suggested that mental illness is an important contributing factor in suicide. The results of community-based psychological autopsy studies of completed suicide have indicated that 80% to 90% of individuals who completed suicide suffered from some form of mental illness (Chynoweth et al., 1980; Eastwood, Stiasny, Meier, & Woogh, 1982; Murphy & Wetzel, 1992). The most prevalent psychological disorders among these samples were depression and alcoholism. Considered together, affective disorders and alcoholism were cited as the cause in 25% to 86% of all suicides, depending on the particular study and the characteristics of the sample (Chynoweth et al., 1980; Kasper Schindler, & Neumeister, 1996; Murphey & Wetzel, 1992).

Within psychological autopsy studies, psychological diagnoses of the deceased are typically made on the basis of interviews with their family and close friends. In the aftermath of suicide, when trying to make sense of the tragic death, surviving family and friends want to believe that their loved one was not "in their right mind" at the time of the suicide. Survivors often comment that the deceased must have been mentally ill because he/she committed suicide (Fazakas-DeHoog, 1998). Further, a common myth regarding suicide is that individuals have a tendency to equate suicide with mental illness (B. Connell, personal communication, October, 1997). Such a bias may have affected the rate at which family and friends reported symptoms associated with depression and other psychological disorders, thereby inflating the rate of psychopathology within the samples of these retrospective studies. Thus, the results of retrospective studies may in fact

further perpetuate the "suicide as mental illness" myth. Given these attributional biases, it is possible that the prevalence of mental illness among suicidal individuals is overestimated.

Further, the majority of these diagnoses generally cannot be verified by professional opinion or by structured and reliable diagnostic instruments. When investigating factors that increase the risk of suicidal behavior, Clark and Fawcett (1992) have indicated that only 25% to 30% of all individuals in the sample who committed suicide were in the care of a mental health professional at any time prior to the suicide. If these results can be generalized across other samples, it can be estimated that only about one quarter of all of the diagnoses in retrospective studies can be confirmed by professional opinion or diagnostic measures. Considered together, these findings raise a concern about the accuracy of the estimated association between mental illness and suicidal behavior.

Given the correlation between mental illness and suicide, it is clear that certain psychological disorders are associated with an increased risk of suicide. However, similar to the previous discussion regarding general risk factor theories of suicide, it could be argued that although psychological disorders suggest an increased risk of suicide, this association not does not directly provide any information regarding the underlying causes or processes that contribute to the development of suicide. It is probable that suicide is not caused by mental illness per se, but rather, is associated with many variables, such as hopelessness and negative attitudes, which are also related to suicidal behavior.

Theory of Commonalities of Suicide

While many theorists have attempted to explain suicide in terms of risk factors, others have proposed theories into which numerous risk factors have been integrated. One such theory, the Theory of Commonalities of Suicide, was proposed by Shneidman in 1993 (Table 1). Unfortunately, despite the fact that Shneidman initially published his commonalities of suicide over

Table 1:
Ten Commonalities of Suicide

I.	The common purpose of suicide is to seek a solution.
II.	The common goal of suicide is cessation of consciousness.
III.	The common stimulus in suicide is unbearable psychological pain.
IV.	The common stressor in suicide is frustrated psychological needs.
V.	The common emotion in suicide is hopelessness-helplessness.
VI.	The common cognitive state in suicide is ambivalence.
VII.	The common perceptual state in suicide is constriction.
VIII.	The common action in suicide is egression.
IX.	The common interpersonal act in suicide is communication of intention.
X.	The common consistency in suicide is with lifelong coping patterns.

Source: Shneidman, E. S. (1993). *Suicide as psychache: A clinical approach to self-destructive behavior.* Northvale, NJ: Jason Aronson Inc.

fifty years ago, research evaluating these proposed commonalities has been limited. Based on the analysis of suicide notes, Leenaars and associates have reported that fatal suicide attempts are associated with cognitive constriction in samples of adolescents (Leenaars, De Wilde, & Wenckstern, 2001) and individuals with a history of alcoholism (Leenaars, & Wenckstern, 1999). Unbearable psychological pain has also been identified in suicide notes written by fatal suicide attempters (Leenaars et al., 2001). The other commonalities proposed by Shneidman have yet to be fully investigated. Evidently, further research is required to further evaluate whether the other factors that Shneidman proposed are common to all suicides.

Shneidman (1993) subsequently integrated his ten commonalities of suicide into a more comprehensive theory. Within this theoretic cubic model, Shneidman proposed that suicide is the result of 3 converging factors: pain, press, and perturbation. Each of these factors occupied a surface of a three-dimensional cube and were conceptualized as a continuum ranging from very low (1) to very high (5). Shneidman defined *pain* as a state of unbearable distress resulting from unmet psychological needs, whereas *press*, involved all aspects of an individual's environment, either real or imagined, that had an impact on the person in either a positive or negative way. Perturbation, the third factor in Shneidman's model, involved a state of perceptual constriction, coupled with impulsiveness, or the need for immediate action and resolution. Shneidman described perceptual constriction as a state characterized by tunnel vision, a narrowing of cognitive focus and a perceived lack options or solutions. According to Shneidman (1993) suicide was imminent, when all three components, pain, press, and perturbation, combined at high levels.

This theory appears to have several strengths. First, relative to other theories, Shneidman's theory is more comprehensive and incorporates several risk factors. Shneidman included external factors (press) and internal factors (pain) as well as affective and cognitive

variables in this model. As such, Shneidman's model is more dynamic and multidimensional than simple risk factor models of suicidal behavior.

An additional strength of this particular model is the fact that Shneidman indicated how individuals might move from low suicide risk to high suicide risk. Specifically, Shneidman proposed that as pain, press, and perturbation increase, the risk of suicide will also increase incrementally. Consequently, an additional strength of this theory is the fact that it allows for the differentiation between the absence and presence of suicide attempts.

Although Shneidman's cubic theory of suicide is associated with several strengths, it also has certain limitations. For example, Shneidman suggested that if all three scores (pain, press, and perturbation) exceeded 4, suicide was probable, but he did not indicate how pain, press, and perturbation might be operationalized. Another disadvantage of Shneidman's theory is that this model does not address the differentiation between the presence and absence of suicide ideation. Perhaps some score is considered to be a critical point above which suicide ideation is present although this particular issue is not discussed in any detail.

An additional limitation with Shneidman's theory is the fact that he does not clearly describe the processes through which these various factors interact. Shneidman suggested that perturbation involved a state of perceptual constriction coupled with impulsiveness, but he did not specify how these two factors might interact to increase the individual's risk of suicidal behavior.

The results of research investigating the components of Shneidman's cubic model have been mixed. As noted previously, Leenaars and associates (2001) have reported evidence of psychological pain in suicide notes written by fatal suicide attempters. Certain researchers have reported that suicidal behavior is associated with impulsiveness. For instance, Swann, Dougherty, Pazzaglia, Pham, Steinberg and Moeller (2005) have reported that individuals with bipolar disorder who have a history of severe suicidal behavior demonstrate high levels of impulsivity. Baca-Garcia

and associates (2005) have reported that impulsive suicide attempts tended to occur in the absence of depression and were less lethal. However, although impulsivity is related to suicide attempts, researchers have indicated that not all suicide attempters score high on measures of impulsivity (Williams, Sale, & Wignell, 1976). Evidently there is a complex relationship between impulsivity and suicide which requires further empirical examination. What does seem clear though is that impulsivity is not common to all suicides as Shneidman suggested. Despite the fact that Shneidman initially published his theory over a decade ago, researchers have yet to empirically evaluate the integrity of Shneidman's cubic theory. Given the strengths of this particular theory, additional research is certainly warranted.

Diathesis-Stress Problem-Solving Model of Suicide

Other theorists have proposed theories of suicidality that explain suicidal behavior in terms of predictors and processes that are combined in an integrated model of suicidal behavior. One such theory, the Diathesis-Stress Problem-Solving Model of Suicide has been proposed by Clum and associates (Patsiokas, Clum, & Luscomb, 1979; Schotte & Clum, 1982). According to this theory, suicide occurs when a high level of life stress (as measured by negative life events) is combined with problem-solving deficits to produce a heightened sense of hopelessness and a related risk of increased suicidal behavior.

When considered alone, the singular components of this theory have been supported by research findings. Individuals who are suicidal have, for instance, been found to report more "negative" life events six months prior to suicide attempts (Schotte & Clum, 1982). Researchers have also reported that problem-solving deficits (Schotte & Clum, 1987) and hopelessness (Topol & Reznikoff, 1982) are associated with an increased risk of suicidal behavior.

However, when testing this model in its entirety results have been less supportive. Yang and Clum (1995) assessed whether stress and problem-solving interacted to impact hopelessness

and suicide ideation. A sample of 101 college students were asked to complete measures of life events, depression, hopelessness, and several indices of problem-solving skills. Yang and Clum (1995) reported that life stress and problem-solving were independent predictors of suicidal ideation. However, when using a path analytic technique to test the integrity of the entire model, these researchers found that only the individual's confidence about his/her problem-solving ability interacted with life stress to predict hopelessness and suicidal ideation. Other measures of problem-solving ability, such as the number of alternatives generated in response to a problem, and the number of reported pros and cons associated with each alternative were dropped from the model, as they added no significant contribution to the prediction of suicide ideation.

It is worth noting that an individual's problem-solving confidence is not really a measure of problem-solving ability per se, but rather represents a measure of an individual's cognitive appraisal of this ability. Consequently, the results of the study reported by Yang and Clum (1995) are not entirely supportive of the "Diathesis-Stress Problem-Solving Model of Suicide", at least as it was conceptualized by this group of researchers. However, these results do indicate that negative appraisals have an indirect impact on suicidal ideation, as mediated by hopelessness.

Further, it is noteworthy that researchers have generally found that life events are not necessarily inherently negative or stressful per se. Rather, whether a given event is "stressful" depends at least in part on the individual's cognitive appraisal of the event, combined with an appraisal of his/her ability to cope with a given event (Lazarus, 1966; Lazarus & Folkman, 1984). Given the demonstrated mediating effect of cognitive appraisals, Schotte and Clum's (1982) model could also be criticized as incomplete, as this model does explicitly identify the individual's cognitive appraisals as a component of the model.

The Diathesis-Stress Problem-Solving model also has several other limitations. Given that numerous factors are associated with a risk of suicidal behavior, this particular model is not

particularly comprehensive. Clum and associates (1982) defined the cognitive component of the theory only in terms of problem-solving deficits, when in fact researchers have reported that numerous other cognitive variables are also implicated in the development of suicidal thinking and behavior. Further, this theory does not account for other important predictors such as affect. Consequently, although this model involves the integration of life stress (events) and problem-solving, which are established risk factors for suicidal behavior, other important factors have been omitted. Furthermore, as Clum et al. (1982) do not differentiate among suicide ideation, attempts, and completion within this particular model, it is difficult to determine how or even if, life stress and problem-solving deficits would interact differentially across these different groups.

The Suicide Trajectory Model

A final theory that will now be reviewed is the suicide trajectory model that was proposed as a framework for organizing suicidology literature across the lifespan (Stillion, McDowell, & May, 1984). Within this model, Stillion and associates (1984) have proposed that four major categories of risk factors must be considered when studying suicidology. These categories include *biological* (genetics, brain anatomy, neurophysiology,) *psychological* (depression, low self-esteem, hopelessness, poor coping, and existential issues), *cognitive* (developmental level, negative self-talk, cognitive rigidity, selective abstraction, and inexact labeling) and *environmental (*negative life events or family experiences, and the presence of firearms) factors.[2] According to Stillion and associates (1984) these four categories interact in the development of suicide ideation, which in turn lead to the development of suicidal behavior. Further, in this model it was proposed that suicide ideation may also lead to *warning signs*, and *triggering events* which individually, or in

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2. Researchers have proposed theories of suicide that span many disciplines, including biological, psychological, and sociological theories. Given the constraints of the current dissertation it is not possible to provide an exhaustive review here. (For more comprehensive reviews see Joiner (2005), Lester (1997), Lester (2000), and Stillion, McDowell, and May (1984).

combination, might also lead to suicidal behavior.

The trajectory model of suicide has several strengths. First, as it was developed to organize current research, it is consistent with extant suicidology findings. Another strength of this model is that it clearly differentiates between the development of suicide ideation and suicidal behavior. Further, the trajectory model is very comprehensive as it explains the development of suicide ideation in terms of biopsychosocial and environmental factors across the entire lifespan.

The trajectory model of suicide also has certain limitations. Most notably, the trajectory model does not clearly specify how suicide ideation leads to suicidal behavior, nor does it provide a means of determining which individuals who are ideating will ultimately act on these thoughts. In addition, while Stillion and associates indicated that biological, psychological, cognitive, and environmental categories of risk factors are important in the development of suicide ideation, these theorists did not clearly delineate how the numerous risk factors subsumed under these categories interact in the development of suicide ideation. Finally, the complex and comprehensive nature of this model, which is arguably its greatest strength, is also a limitation at least from an empirical perspective. Given the numerous complex relationships in this theory, it would be incredibly challenging, if not impossible to empirically examine this model in its entirety. Despite its limitations though the trajectory model is an important addition to the suicidology literature, as it provides a comprehensive framework for organizing and understanding the complex factors that contribute to the development of suicidal thinking and behavior.

Summary

In summary, many extant theoretical explanations of suicide have certain strengths, but are also associated with a number of limitations. These limitations include a failure to consistently define relevant terms and concepts, a tendency to treat all suicidal behavior as homogeneous, and a propensity to explain suicidal thinking and behavior in terms of a few isolated risk factors, while

omitting other established risk factors of suicide. Further, researchers generally have not proposed or explained the processes or mechanisms through which suicidal thinking and behavior develop. Essentially, there is an apparent lack of explicit integrated process theories of suicidal thinking and behavior in the suicidology literature. Consequently, the primary goal of this thesis was to empirically validate an integrated theory of suicidal thinking and behavior. Prior to delineating this new theory, the factors and processes that are known to be associated with suicidal thinking and behavior are reviewed. A tabular summary is also presented in Appendix A.

CHAPTER 2: ESTABLISHED FACTORS AND PROCESSES RELATED TO SUICIDAL THINKING AND BEHAVIOR

Personality and Suicide

There is a growing body of research linking self-destructive behavior to specific personality traits. As an exhaustive review of this growing body of research is well beyond the scope of this discussion, only a brief overview is presented here. (For a more extensive review, see Blasco-Fontecilla, Baca-Garcia, & Saiz-Ruiz, 2007). Researchers have reported that suicide risk is associated with perfectionism (O'Connor, O'Connor, & Marshall, 2007), low self-esteem (Palmer, Rysiew, & Koob, 2004) low levels of dispositional optimism (Hirsch, & Conner, 2006) and neuroticism, external locus of control, and impulsivity (Beautrais, Joyce, & Mulder, 1999).

Researchers have also established that self-destructive behavior is related to certain personality disorders. Borderline Personality Disorder, which is characterized by impulsivity and chronic instability in relationships and sense of self, is associated with a high risk of suicidal behavior with an estimated 10% of these individuals dying by their own hand (Paris, 2002). Borderline Personality Disorder is also associated with suicide gestures thereby increasing the risk of unintentional deaths in this group as well (Lambert, 2003).

Clark (1993) has also proposed a theory of suicide, "the Wedding Cake Theory" that explains increased suicide risk in terms of a "lifelong character flaw" (Clark, 1993, p.21) [Narcissistic Personality Disorder] which was becomes manifest when triggered by the developmental challenges of aging. Heisel, Links, Conn, van Reekum and Flett (2007) have also identified Narcissistic traits as an indicator of increased suicide risk in a depressed elderly population. Clearly there is a link between personality and vulnerability to suicide ideation and suicidal behavioral which merits the continued attention of suicidology researchers.

Cognitive Factors

As discussed previously, any valid and comprehensive theoretical model of suicide should integrate, or at the very least be consistent with, current empirical findings. Based on a comprehensive review of the suicidology literature, it is apparent that several factors are associated with an increased risk of suicidal behavior. A number of these factors can be subsumed under a category of dysfunctional cognitions. It is noteworthy that several authors (e.g., Kendall, 1985; Kendall & Dobson, 1993; Kendall & Macdonald, 1993) have distinguished between cognitive deficits and cognitive distortions, and have suggested that different types of cognitive difficulties are associated with different types of disorders. Although this distinction may also have utility for understanding and predicting suicidal behavior, researchers have not applied this distinction to the study of suicidal thinking and behavior. Prior to reviewing the cognitive factors associated with suicidal behavior, this distinction will be briefly discussed, and it will be proposed that this distinction has important implications for understanding suicidal behavior.

Kendall and Dobson (1993) have explained the distinction between cognitive deficits and distortions in the following way. Cognitive deficits "refer to a lack of certain forms of thinking (e.g., the absence of information processing where it would be beneficial), whereas distortions refer to active, but dysfunctional thinking processes" (p. 10). This deficiency-distortion distinction has been applied to various psychological disorders, in an attempt to better understand the cognitive processes associated with these particular disorders, and to facilitate the development of disorder-specific treatment strategies.

Researchers have, for example, determined that depression is primarily associated with cognitive distortions. Information processing occurs, but the content is distorted (Ackerman, & DeRubeis, 1993). For example, depressed individuals are able to process information, but the processing is skewed such that they perceive themselves as negative, incompetent, or unworthy

(Kendall, Stark, & Adam, 1990). Similarly, anxiety is associated with cognitive distortions, but not deficits. Information processing is present, but the individual's perception of threat is exaggerated or distorted (Beck & Emery, 1985). As with depression, in anxiety, cognitive processes are intact, but are distorted.

Other disorders, such as Attention-Deficit Hyperactivity Disorder [ADHD], are characterized more by cognitive deficiencies. A growing body of research has demonstrated that children with ADHD have a number of cognitive deficits including an inability to sustain attention (Zentall, 1985) and organizational and higher-order problem-solving deficiencies (Hinshaw & Earhart, 1990).

Other disorders are characterized by a combination of both cognitive deficits and distortions. One such example is aggression in youth. This group exhibits information-processing deficiencies, especially in social situations, problem-solving deficits, and an inability to properly utilize appropriate social cues (Crick, & Dodge, 1994; Milich & Dodge, 1984). Cognitive distortions are also evident in this group, and include a "hostile attribution bias" (i.e., falsely interpreting others' intentions as hostile), an exaggerated expectation of aggression from others, and an underestimation of their own aggression towards their peers (Lochman, 1987).

It is noteworthy that researchers have found that internalizing (over-controlled) disorders, such as depression and anxiety, are associated primarily with cognitive distortions, whereas externalizing disorders, such as aggression or conduct disorders, are associated with both cognitive distortions and pronounced cognitive deficits. Thus, it is apparent that disorders with an aggressive, or "acting out" component are associated with a combination of both deficits and distortions. Given that suicide attempts can be conceptualized as an aggressive acting out behavior, albeit self-directed, it would be expected that suicide attempts would be associated with a combination of both cognitive deficits and cognitive distortions, and that cognitive deficits will be more severe in attempters than ideators. Although this cognitive deficits-distortions distinction may

have utility for understanding and predicting suicidal behavior, researchers have not yet proposed or investigated this relationship.

A review of the suicidology literature yielded findings that are relevant to the current discussion. Several of the cognitive factors that are associated with suicidal thinking represent cognitive deficits. For instance, Schotte and Clum (1987) have reported that an increased risk of suicide ideation is associated with marked problem-solving deficits in both impersonal and interpersonal domains, including the generation of significantly fewer potential alternatives, and the generation of more irrelevant solutions to problems. Further, relative to non-ideating controls, individuals with suicide ideation are less likely to actually implement viable solutions (Schotte & Clum, 1987).

In addition, compared to non-ideating controls, individuals who contemplate suicide tend to have more difficulties concentrating (Mendonca & Holden, 1996), and demonstrate a higher level of cognitive rigidity (Litinsky & Haslam, 1999; Upmanyu, Narula, & Moein, 1996; Perrah & Wichman, 1987). These dysfunctional forms of thinking can be classified as cognitive deficits, or an absence of an adaptive form of thinking. Recent research has found that the association between cognitive impairment and suicide ideation is mediated by depression and hopelessness (Heisel, Flett, & Besser, 2002).

In addition to these cognitive deficits, researchers have identified a number of skewed or distorted cognitions that are related to an increased risk of suicide ideation. In general, researchers have found a positive correlation between negative thinking and suicide ideation. Compared to non-suicidal groups, suicidal individuals have a tendency to view themselves, their world, and their future in a more negative manner. Researchers have consistently found a positive correlation between levels of hopelessness and degree of suicide risk, with higher levels of hopelessness associated with increasing levels of suicide intent and fatal attempts (Boergers et al., 1998; Kumar

& Steer, 1996). Although researchers have generally found a negative pattern of thinking in association with suicidal behavior, there is one notable exception. Suicidal individuals rated death as more positive and were more preoccupied with death, than their non-suicidal counterparts (Gothelf et al., 1998; Neuringer, 1979). Although skewed in a positive direction, these cognitions are maladaptive. As such, they also represent distorted thinking patterns.

Researchers have also demonstrated that individuals who are ideating appraise their problem solving skills in negative manner. Clum and Febbraro (1994) have reported an inverse relationship between an individual's perceived problem-solving competence and the severity of suicidal ideation. Further, Schotte & Clum (1987) have reported that, compared to non-ideators, ideators demonstrate a more pervasive belief that generated problem solving alternatives will be associated with more negative consequences.

When considered together, these findings indicate that both cognitive deficits and cognitive distortions play a role in the development of suicidal thinking. As researchers have not proposed or studied this relationship, the degree to which deficits and distortions interact, or uniquely contribute to suicidal thinking and behavior has yet to be examined. A goal of the present study involves investigating this particular issue.

It is also possible that cognitive deficits and distortions have utility for differentiating among suicide ideators, attempters, and completers. Currently these proposed relationships have not been fully examined. To date, researchers have established that cognitive distortions are present in suicide ideators, attempters, and completers. Pessimism, as measured by negative thinking and appraisals becomes more severe along the suicidal continuum. Negative thinking is not only higher in ideators than in non-ideating controls (Goldney et al., 1997), but is also higher in attempters than ideators, and higher in completers than attempters (Beck et al., 1985).

Similarly, researchers have determined that hopelessness is positively correlated with an increasing risk of suicidal thinking and behavior. Ideators have been found to have higher levels of hopelessness than do non-ideating controls (Hewitt et al., 1998), attempters demonstrate higher levels of hopelessness than ideators (Topol & Reznikoff, 1982), and completers have higher levels than attempters (Kumar & Steer, 1996). As thinking becomes more and more negative, and the individual becomes increasingly hopeless, the risk of acting on suicidal thoughts increases. In summary extant research findings have suggested that cognitive distortions are not only present in suicide ideators, attempters, and completers, but also become more severe along the suicidal continuum.

While it is also possible that cognitive deficits have utility for differentiating among suicide ideators, attempters, and completers, the results of research investigating this relationship has been limited and results have been mixed. Certain researchers have reported that relative to non-ideators, suicide ideators have deficits in problem-solving (Schotte & Clum, 1987). Other researchers though have reported that problem-solving deficits do not differ appreciably between suicide ideators and non-ideators (Yang & Clum, 1995). These mixed findings are somewhat difficult to interpret. One possibility is that the samples in these studies differed significantly in terms of the degree of suicide ideation. But, as these authors have not commented on the level of suicide ideation in their respective studies, it is difficult to determine whether these mixed results can be attributed to sample characteristics. Consistent with the observation that cognitive deficits are typically more closely associated with externalizing disorders, in the current study it is predicted that cognitive deficits will differ very little, if at all, between suicide ideators and non-ideators.

Although researchers have investigated the relationship between cognitive deficits and suicide ideation, less is currently known about how cognitive deficits differ between ideators and attempters, or between attempters and completers. Thus, another goal of the present research is

to further examine these relationships. Considering the reviewed findings, it is apparent that any valid model of suicidal thinking and behavior should incorporate these cognitive factors. In the present theoretical model, it is proposed that both cognitive deficits and cognitive distortions assume an important role in the development of suicidal thinking and behavior. Further, it is proposed that both types of cognitive dysfunction increase in severity along the suicidal continuum.

Affective Factors

A number of affective variables appear to be associated with an increased risk of suicidal behavior. Compared to controls both ideators and attempters show a restricted range of affect and a greater intensity of negative affect (Horesh et al., 1997), especially higher reported levels of guilt (Van Gastel et al., 1997) and self-directed anger (Goldney et al., 1997; Simonds et al., 1991).

Although researchers have determined that both cognitive and affective factors are important predictors of suicidal behavior, theorists have not yet integrated both types of factors into a process theory of suicidal behavior. It could be hypothesized that high negative affect, combined with low positive affect, would lead to hopelessness and suicidal ideation.

Several researchers have examined the dimensionality of affect as it pertains to depression and anxiety. For example, MacLeod, Byrnem, and Valentine (1996) had a sample of college students complete measures of positive and negative affect, depression, anxiety, and future-directed thinking. When the participants' responses were factor analyzed, two clear cognitive-affective factors emerged. Negative affect, worry, anxiety, depression, and negative expectancies loaded onto the first factor. The second factor had high positive loadings from positive affect and positive expectancies and negative loadings from depression and hopelessness. On the basis of these findings, MacLeod and associates (1996) concluded that there are two basic cognitive-affective systems that impact motivation and behavior. Researchers,

who have examined affective states in depressed adults, have reported findings that support these two factors (Lawton, Powell, Parmelee, Katz, & Nesselroade, 1996; Luten, Ralph, & Minek, 1997).

Given these findings, combined with the fact that suicidal behavior is so highly correlated with both hopelessness and depression, it is probable that suicidal behavior will be associated with high levels of negative affect and low levels of positive affect. However, no extant studies have investigated the relationship between positive affect and suicidal thinking and behavior. Intuitively, it would seem that suicidal thinking and behavior would be associated with an absence of positive affect. Yet, there are some observations in the literature that challenge this assumption.

For instance, Shneidman (1993) has suggested that suicide is characterized by ambivalence. Ambivalence has been defined as simultaneously having both positive and negative thoughts and feelings about a given object, event or activity (Raulin, 1984). If suicide ideation is, in fact, characterized by ambivalence, it is expected that individuals who are ideating will simultaneously report both positive and negative affect. To date researchers have not investigated whether positive affect differs among non-ideators, ideators or attempters.

A large body of literature has, however, investigated the relationship between positive affect and attitudes, and these findings have relevance for the current discussion. In general, positive affect has demonstrated a positive relationship with optimistic attitudes and a negative relationship with pessimistic attitudes (Diener & Seligman, 2002; Fazakas-DeHoog, 1997). Given the similarities between pessimistic attitudes and hopelessness, and the findings that hopelessness increases as the risk of suicide increases (Kumar, & Steer, 1996), it could be proposed that positive affect will decrease as suicide ideation becomes more severe.[3]

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[3] Over the period of time that it took to complete the current dissertation, researchers have begun to publish findings linking positive affect to a decreased risk of suicide ideation. (See, for example, the work of Hirsch, Duberstein, Chapman, & Lyness (2007) and Hirsch, & Conner (2006).

However, it is noteworthy that researchers have also found that some individuals who ultimately decide to commit suicide report slight increases in positive affect for a period of time prior to the attempt (Maris, 1981). The fact that family members often report that their loved one's mood seemed to improve and become more positive immediately before a fatal suicide attempt also supports this finding (Fazakas-DeHoog, 1998). It has been proposed that this shift in affect occurs when individuals become clear about their decision to end their life, as this decision is associated with a solution and an associated sense of relief. Considered together, these findings suggest that positive affect decreases as ideation becomes more severe, and then increases after the individual has made the decision to end his/her life.

In summary, researchers have identified a number of cognitive and affective factors that that are positively correlated with an increased risk of suicidal thinking and behavior. Given their importance, and their established inter-relationship, both cognitive and affective factors have been integrated into the proposed model.

CHAPTER 3: AN INTEGRATED COGNITIVE AFFECTIVE MODEL OF SUICIDAL THINKING AND BEHAVIOR

The fundamental questions of suicidology research remain: Why is it that some individuals contemplate suicide? Further, why is that some of these individuals who contemplate suicide act on these self destructive thoughts, whereas others do not? Currently we have no definitive answer to these questions.

Based on an extensive review of extant suicidology literature, an integrated cognitive affective model of suicidal thinking and behavior was developed with the goal of potentially addressing these questions. Given that there are demonstrated differences amongst ideators, attempters and completers, within the proposed model, suicidal thinking and behavior are conceptualized as a continuum, moving from an absence of suicidal thinking at one end to severe suicide attempts resulting in death at the other end of the continuum.

Within this Integrated Cognitive Affective Model of Suicidal Thinking and Behavior, a combination of affective factors and cognitive deficits and distortions interact in the development of suicidal ideation. When negative affect is combined with a tendency to ruminate, cognitive distortions develop and the individual ultimately develops cognitive deficits as well. With the development of cognitive deficits and cognitive distortions, affect becomes increasingly negative, and the individual becomes increasingly likely to contemplate suicide. The first phase of this proposed model, which involves the development of suicide ideation, is presented in Figure 1.

The second phase of the model involves the decision to attempt suicide after suicide ideation has developed. Specifically, once suicide ideation develops, rumination continues, and the cognitive distortions and deficits and associated affective changes become more severe over time, leading to an increased probability of acting on the suicidal thoughts. Further, the more severe the cognitive deficits, cognitive distortions and associated negative affect, the greater the probability

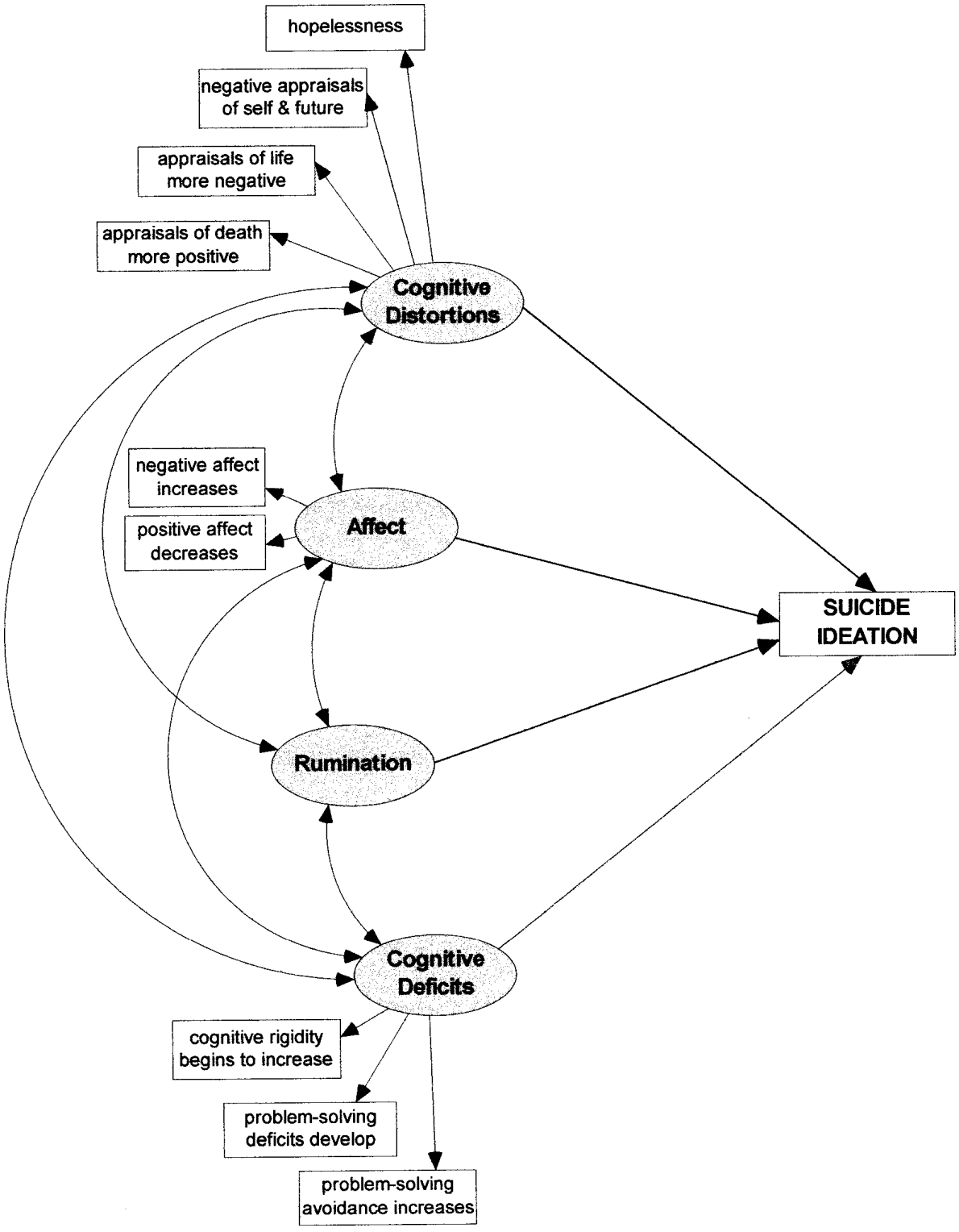


Figure 1: Theoretical Integrated Cognitive-Affective Model of Suicidal Thinking - First Phase

that the individual will choose a more lethal method of suicide. It then follows that the more lethal the chosen method of suicide, the greater the risk of death as a result of the attempt. The second phase of the proposed theory is presented in Figure 2.

Proposed Relationship between Affect and Cognitive Distortions

In the proposed model, affect is expected to have a reciprocal relationship with cognitive distortions. The relationship between affect and cognitive appraisals has been studied extensively. In general, researchers have reported that positive affect tends to be positively correlated with positive appraisals (Forgas, 2001; Ahrens, & Haaga, 1993), whereas negative affect tends to be positively correlated with negative cognitive appraisals (Watson, Pennebaker & Folger, 1987; Watson & Clark, 1984). Consequently in the proposed model, affect and cognitive distortions are expected to demonstrate a reciprocal relationship with each impacting the other.

Proposed Relationship between Affect and Cognitive Deficits

The relationship between affect and those cognitions that could be classified as cognitive distortions has been extensively examined. Less is currently known though about the relationship between affect and cognitive deficits, as this relationship has received little attention in the literature. Consequently, it is more difficult to precisely predict this relationship. There is, however, some extant research that has some implications for predicting the relationship between affect and cognitive deficits. In one relevant study, Heisel and associates (2002) demonstrated that depression and hopelessness mediate the association between cognitive impairment and suicide ideation.

Other relevant findings come from the large body of research that has supported the effect of mood-congruent recall. Although a comprehensive discussion of these findings is well beyond the scope of the current discussion, a few relevant trends are summarized here. In general, researchers (e.g., Mineka, & Nugent, 1995) have demonstrated that non-dysphoric mood

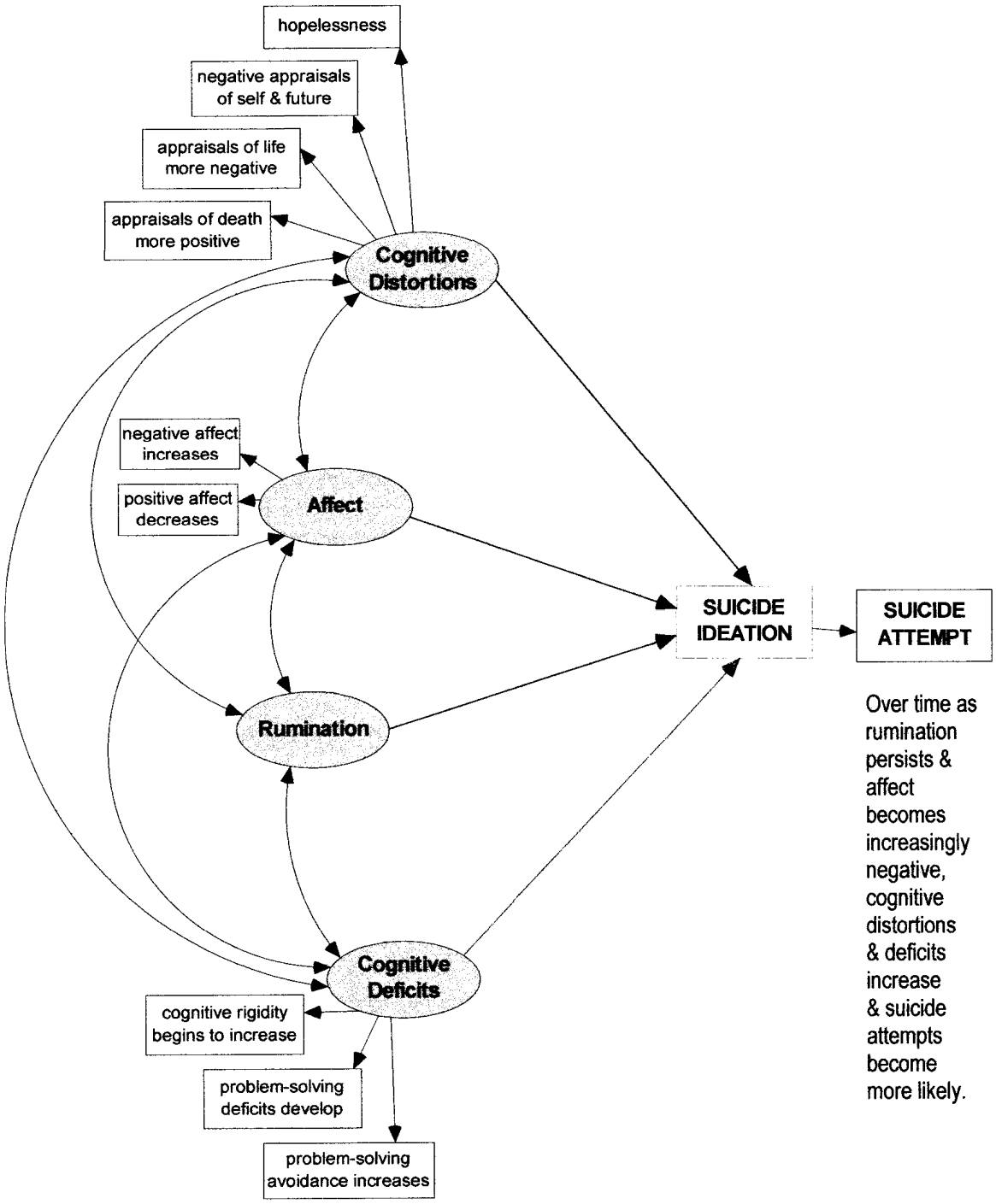


Figure 2: Theoretical Integrated Cognitive-Affective Model of Suicide Attempts – Second phase

(positive affect) is associated with greater recall of positive memories, whereas dysphoric mood (negative affect) is related to either approximately equal recall of positive and negative events, or more negative than positive events (Miranda & Persons, 1988; Miranda, Persons, & Byers, 1988). For a review see Matt, Vasquez, and Campbell (1992) and Blaney (1986).

This demonstrated relationship between mood and memory has implications for predicting the association between cognitive deficits and affect in the current model. It is possible that affect impacts cognitive deficits in a number of ways. First, it could be postulated that as affect becomes increasingly negative and an individual becomes more likely to recall primarily negative memories and outcomes, he/she is more likely to recall more problem-solving failures, and ultimately become less likely to engage in active problem-solving efforts (i.e., more avoidant regarding problem-solving). It is also likely that affect will be related to cognitive rigidity. Specifically, it could be hypothesized that as affect becomes increasingly negative and an individual becomes more likely to recall primarily negative memories and outcomes, the individual's thinking is likely to become not only more negative but also more rigid (i.e., more negatively fixed). Fredrickson and Joiner (2002) have reported that positive affect is related to an expansive and flexible thinking style. Given these findings, it is probable that an absence of positive affect will be related to cognitive rigidity.

A tendency to recall primarily negative outcomes is likely to exacerbate and further reinforce negative affect. In this sense then, it could be predicted that affect and cognitive deficits are likely to have a reciprocal relationship. This proposed relationship between affect and cognitive deficits is likely to become the strongest as positive affect and the associated recall of positive memories decrease. As was previously discussed, as suicide ideation initially develops, it is expected that an individual will report moderate levels of both positive and negative affect. Accordingly, the reciprocal relationship between affect and cognitive deficits is expected to be weaker while is the individual is contemplating suicide, but has not yet acted on these ideas.

However, as negative affect increases and positive affect decreases, and the individual becomes more likely to make a suicide attempt, the reciprocal relationship between affect and cognitive deficits is expected to be much stronger. Consequently, cognitive deficits are expected to be more important at the suicide attempt phase than the suicide ideation phase in the proposed model.

The relationship between affect and cognitive deficits is also likely to impact the development of cognitive distortions. That is, it could be hypothesized that, as affect becomes increasingly negative and an individual becomes more likely to recall primarily negative memories and outcomes, he/she will be less likely to recall successful problem-solving outcomes and consequently become less confident regarding problem-solving abilities. This lack of problem-solving confidence may then contribute to a sense of hopelessness and negative appraisals regarding future outcomes, thereby contributing to an increasing level of negative appraisals (i.e., cognitive distortions).

Conversely, it is also expected that these increasing levels of hopelessness and cognitive distortions will in turn impact cognitive deficits. As such, cognitive deficits and distortions are expected to demonstrate a reciprocal relationship in the proposed model. Again, this relationship is expected to be the strongest as the cognitive distortions become more pronounced, and the individual moves from the ideation phase to the suicide attempt phase of the proposed model.

Rumination

A limitation of extant suicide theories is the general omission of process variables. Although theorists have linked a limited number of established risk factors in their proposed theories, fewer theories integrate the specific processes that interact with these factors to explain the development of suicidal thinking and behavior. As was summarized previously, there is a growing body of research that supports the distinction between suicide ideation, non-fatal suicide attempts, and fatal suicide attempts. Although there are factors that allow the differentiation

between these behaviors, it is also possible that suicidal thinking and behavior can be conceptualized as a continuum. We know, for example, that suicidal ideation occurs in the general population, but is usually transient and time-limited. In addition, although they are likely more vulnerable to suicidal behavior, individuals who are actively suicidal are not always in this acute self-destructive state. At some time previously, they likely engaged in suicidal ideation, but were not acting on these thoughts. Conversely, it is also true that suicidal thinking and behavior can be successfully treated, such that an individual who has been actively suicidal no longer engages in suicidal thinking or behavior. Given these findings, it seems clear that some process, or combination of processes, underlies these changes.

One process that has been linked to suicidal ideation is a ruminative thinking style. Researchers have, for example, determined that individuals who engage in suicidal thinking also report more ruminative thinking (Ahrens & Linden, 1996). As researchers have only recently begun to examine the relationship between ruminative thinking and suicidal behavior, a clear understanding of how this process impacts suicidal behavior remains somewhat speculative. However, a number of research findings in the depression literature are relevant to the present discussion. For example, Nolen-Hoeksema and Morrow (1993) reported that in depressed patients, rumination is associated with dysphoria that is both exacerbated and prolonged.

Researchers have also reported findings that suggest that rumination mediates between affect and negative thinking. In three separate studies, Lyubomirsky and Nolen-Hoeksema (1995) examined the impact of rumination on negative thinking and problem-solving in participants who were either dysphoric or non-dysphoric. These researchers reported that for the dysphoric group, those individuals who engaged in self-directed ruminative thinking generated less effective solutions to interpersonal problems, reported more negative thinking, and were more pessimistic about positive events in their future. It is also noteworthy that dysphoric individuals who engaged in

distraction, rather than ruminative thinking were just as optimistic about, and effective in, problem-solving as the non-dysphoric group.

The findings reported by Lyubomirsky and Nolen-Hoeksema (1995) have a number of important implications for understanding how individuals who are experiencing high levels of negative affect may ultimately develop suicidal thinking. First, individuals who were not dysphoric were optimistic about their future, and were effective problem-solvers. Consequently, it appears that dysphoria, or negative affect, is necessary for the development of hopelessness. It is also noteworthy that individuals who were dysphoric, but engaged in distraction rather than rumination, did not become more pessimistic over time. Considered together these findings indicate that negative affect is necessary, but not sufficient, to produce suicidal thinking and behavior.

The findings reported by Nolen-Hoeksema and colleagues (Nolen-Hoeksema & Morrow, 1993; Lyubomirsky & Nolen-Hoeksema, 1995) suggest that rumination is an important process in the development and maintenance of hopelessness and negative thinking. Considering that hopelessness and negative thinking are associated with an increased risk of suicidal ideation and attempts, it is also probable that rumination plays an important role in the development of suicidal thinking and behavior. An individual who is dysphoric, and engages in rumination, becomes increasingly negative and unable to generate effective solutions to problems. This resulting negative thinking, and problem-solving deficits, further reinforce and increase feelings of dysphoria and hopelessness. This cycle would then be self-perpetuating; the individual's affect would become increasingly negative, and his/her cognitions would become increasingly distorted. As this cycle repeats, the individual would develop an increased risk of suicidal behavior, and ultimately be more likely to act on self-destructive thoughts.

The proposed model has been designed to overcome a number of the limitations which are apparent in previous theories and studies. One such limitation is the fact that many previous

researchers have not differentiated among suicide ideators, attempters, and completers, and instead have treated suicidal thinking and behavior as homogenous despite obvious differences among these groups (Smith & Maris, 1986). In the current cognitive affective model, suicidal thinking and behavior is conceptualized as a continuum, and a distinction is made amongst these three groups.

Another strength of the current model is that a number of established factors and processes including rumination and cognitive and affective factors are integrated into the proposed cognitive affective model. Further, the factors and relationships in the proposed model are theoretically grounded and consistent with extant research findings.

Given that validating all aspects of this complex process model is beyond the scope of this dissertation, certain selected components of the model were assessed in three independent, but related studies. The first study involved testing the integrity of the proposed model in a large undergraduate sample. The proposed relationships in the model were further examined by assessing whether significant differences were evident between non-ideation and ideation, in terms of the factors in the proposed model. An additional goal of the first study involved assessing the relative utility of each of the indicators in the model in the prediction of suicide ideation.

The second study was conducted in a community sample, comprised of recent suicide attempters, current suicide ideators, and non-ideating controls. The primary aim of the second study was to assess the relative utility of the indicators in the proposed model in the prediction of suicide ideation and suicide attempts and to identify which of these variables, or combination of variables, most adequately differentiated between non-ideating controls and ideators, and between ideators and attempters. An additional goal of the second study was to determine whether the variables differed across these three groups, as proposed in the tested model from Study 1.

The third study, which was exploratory in nature, included analyzing the content of suicide notes and interviewing the next of kin of the individuals who had written suicide notes. The main objective of this study was to assess the degree to which the cognitive and affective indicators from the proposed model were evident in the content of the suicide notes. The interview with each suicide completer's next of kin was undertaken to complete a retrospective psychological autopsy, which included an estimate of the suicide completer's affective and cognitive functioning prior to the suicide.

Each of the three studies will now be discussed separately. The rationale and the specific hypotheses for each proposed study will be presented in turn. Subsequently, the methodology will be clearly delineated and the results of each study will be presented and discussed. Finally, the implications of the current findings will be discussed, and future directions will be proposed.

CHAPTER 4: STUDY 1

Model Testing

The primary goal of the first study was to test a model of suicidal ideation ("Integrated Cognitive-Affective Model of Suicidal Ideation" as presented in Figure 1) in a sample of suicide ideators and non-ideators. Throughout the previous section, the expected relationships between the variables in the proposed model have already been extensively discussed and are only briefly summarized here. In the proposed model, a combination of negative affect and rumination is expected to contribute to the development of both cognitive distortions and cognitive deficits. Cognitive distortions are then expected to have a direct impact on the development of suicide ideation. Further, cognitive distortions are expected to have a much stronger relationship with suicide ideation than are cognitive deficits. It is also hypothesized that all of the various components in the model, including affect, rumination, cognitive deficits and cognitive distortions will demonstrate reciprocal relationships.

The integrity of the proposed model was assessed utilizing structural equation modeling. Predictors for each latent variable in the model were carefully chosen based on research findings in the suicidology literature. The cognitive distortions factor in the model was defined in terms of hopelessness, as well as the individual's cognitive appraisals about self and future. The cognitive deficits factor in the model was assessed by each individual's problem-solving deficits, approach to problem-solving (active approach versus avoidance), and cognitive rigidity (i.e., a deficit in cognitive flexibility). The rumination factor in the model was assessed by each individual's tendency to engage in rumination and obsessive worry. The affect factor in the model was defined in terms of the individual's levels of positive affect, negative affect, and self-directed anger. Further, the individual's degree of suicide ideation was utilized as the outcome variable in the model. The measurement model to be assessed is presented in Figure 3.

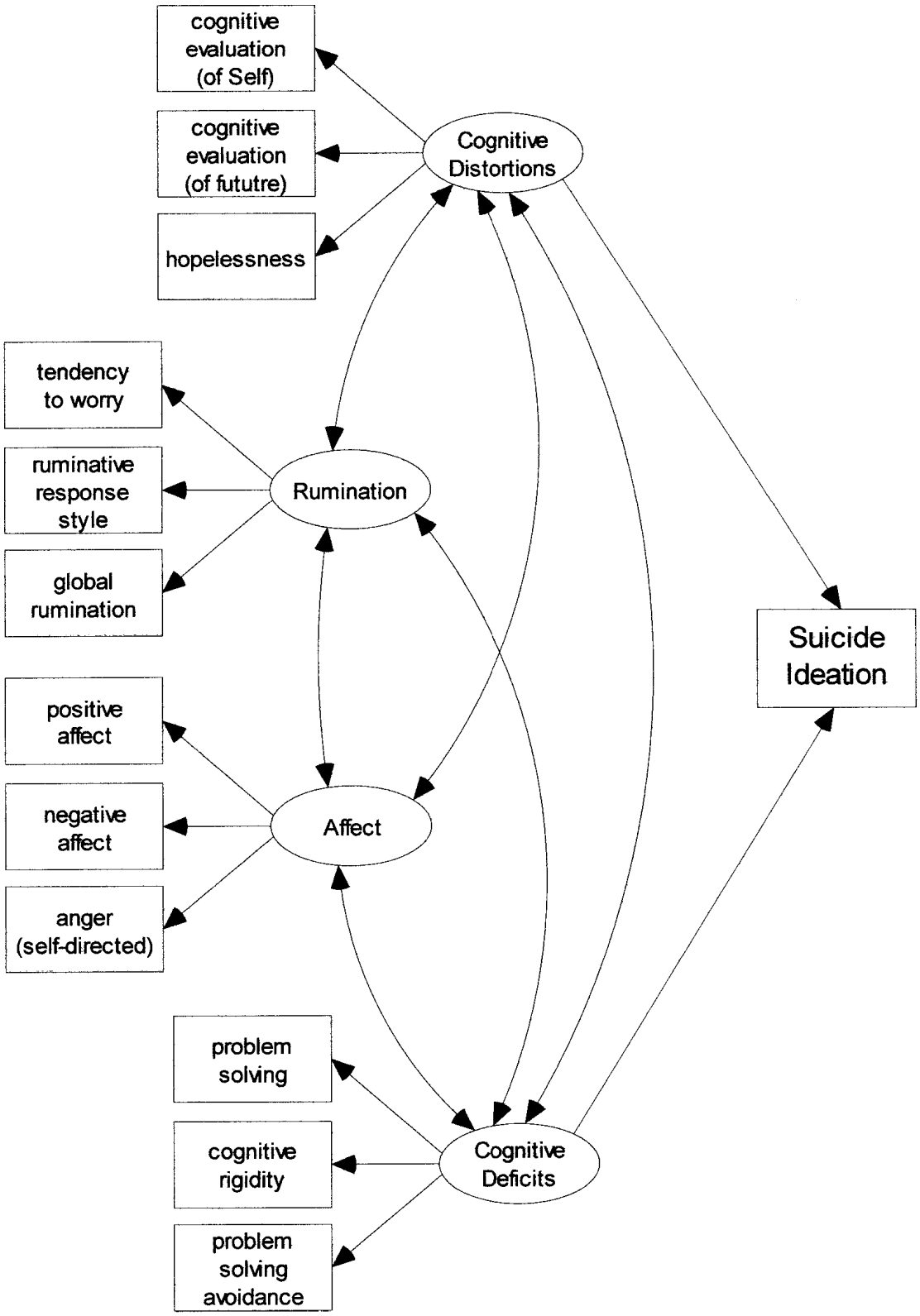


Figure 3: Theoretical Integrated Cognitive-Affective Model of Suicidal Thinking-First Phase with Factor Indicators

Method

One of the preferential statistical analyses for examining the fit of a theoretical model involves the use of structural equation modeling (SEM). The required sample size for running structural equation modeling to assess the fit of any proposed model depends on the number of variables in the model, as well as the number of parameters to be estimated in the model (for a more complete discussion of sample size and SEM, please refer to Maruyama, 1998). Given the characteristics and number of parameters to be estimated in the proposed model, a sample of at least 350 participants was required to assess the fit of the model in the Study 1. Given the large sample size required for the SEM analysis, and the formidable task of trying to recruit hundreds of individuals from the community, an undergraduate sample was chosen for the first study.

Participants

Three hundred and ninety-seven undergraduate Psychology students enrolled in an Introductory Psychology course participated in the first study. The age of the participants (83 males and 314 females) ranged from 17 to 43 with a mean age of 18.69 years. Ninety-eight percent of the sample had never been married and 94.2% were full time students, who were not gainfully employed at the time of the study. The demographic information for this sample is presented in Table 2.

Within this sample, the suicide ideators were identified by their response to item 4 on the Scale for Suicide Ideation. Those individuals who endorsed either "I have a weak desire to kill myself" or "I have a moderate to strong desire to kill myself" were identified as the suicide ideation group in the sample. The remaining participants, who endorsed "I have no desire to kill myself" comprised the non-ideating group in the sample in Study 1. On the basis of these responses, thirty-two (8.1%) of the participants were identified as current suicide ideators. Information regarding past suicide attempts was also collected. Of the participants who were currently experiencing suicide

Table 2:
Study 1: Participant's Demographic Characteristics of the Full Sample

		SESSION 1	
		Frequency	Percent
Sex	Male	83	20.9
	Female	314	79.1
Age	Under 21	384	96.7
	21-25	10	2.5
	26-30	2	0.5
	31-35	0	0.0
	36-40	0	0.0
	41-45	1	0.3
Marital Status	Single	392	98.7
	Married	2	0.5
	Common-law	2	0.5
	Separated	0	0.0
	Divorced	1	0.3
	Widowed	0	0.0
Children	No	394	99.2
	Yes	3	0.8
Education Level Completed	High School	392	98.7
	College	3	0.8
	Undergrad	2	0.5
	Graduate	0	0.0
Employment	None	374	94.2
	Part-Time	20	5.0
	Full-Time	3	0.8
Suicide Ideation	Non-Ideation	365	91.9
	Suicide Ideation *	32	8.1
History of Suicidal Behavior	Past Suicide Attempts	14	3.5
	No Past Attempts	383	96.5
Total participants per sample:		397.00	
Mean Age:		18.69	
Standard Deviation:		1.78	

*Note: Suicide Ideation = active suicidal ideation

ideation, five had previously made at least one suicide attempt. Nine other participants who were not currently experiencing suicide ideation had also made past suicide attempts. Considered together, fourteen (3.5%) of the participants in Study 1 had made past suicide attempts. For this group of past attempters, the mean number of past suicide attempts was 1.7, with five of these individuals having made two or more attempts.

Measures

Demographic Information

Prior to completing the package of questionnaires, each participant completed a demographic information sheet, which contained information about the participant's gender, age, ethnicity, marital status, completed education, current occupation, and religious affiliation. Participants also provided information about their mental health history, treatment, and past suicidal behavior (if applicable). The demographic information sheet is presented in Appendix B.

Scale for Suicide Ideation (BSS; Beck, & Steer, 1993)

The BSS was used in Study 1 to identify individuals who had been contemplating or thinking about suicide over the previous week, and to determine their level of suicidal ideation and intent. The first 19 items of the BSS evaluate three dimensions of suicide ideation, including: active suicidal desire, specific plans for suicide, and passive suicidal desire. A total score on the scale is obtained by adding the values from the first nineteen items. Scores may range from 0 to 38, with high scores representing high levels of suicidal ideation. The last two items of the 21-item BSS, which are not included in the calculation of the BSS scores, are used to identify a history of past suicide attempts and the individual's level of motivation to die in the most recent suicide attempt.

The BSS reportedly has good internal consistency. Coefficient alphas range from .87 (Beck & Steer, 1993) to .93 (Beck, Steer, & Ranieri, 1988). Beck and Steer (1993) reported a one-week test-retest reliability coefficient of .54. While this estimate is somewhat low, it is difficult to

ascertain whether this value represents a weakness with the measure, or is more a reflection of the fluctuating nature of suicidal ideation. Cronbach's alpha in the current sample was .93.

The validity of the BSS has been well established. Researchers have reported positive correlations between BSS scores and other predictors of suicide, including self-report and a history of previous suicide attempts (Beck & Steer, 1993), clinician ratings of suicidality (Beck et al., 1988), and suicide ideation items on other measures, such as the Beck Depression Inventory (Beck & Steer, 1991). (For a more comprehensive review, see Dozois & Covin, 2004).

Cognitive Distortions

The *Beck Hopelessness Scale* (BHS; Beck & Steer, 1988) was utilized in Study 1 to assess each participant's level of hopelessness. This scale is a self-report measure composed of 20 true/false items that assess the degree to which an individual has negative expectancies regarding events in his or her future. Scores on the BHS range from 0 (no hopelessness) to 20 (extreme hopelessness). The BHS exhibits high levels of reliability. Estimates of internal consistency range from .84 (Hill, Gallagher, Thompson, & Ishida, 1988) to .93 (Beck, Rial, & Rickels, 1974). In the current sample Cronbach's alpha was .84.

Research investigating the validity of the BHS has been extensive. The content validity of the BHS has been deemed adequate by a panel of clinicians who reviewed the scale items for content suggesting depression and hopelessness (Beck et al., 1974). As well, high scores on the BHS are positively correlated with clinical ratings of patient hopelessness (Ammerman, 1988) and suicide intent and completion (Beck & Steer, 1988; Beck et al., 1974).

In addition, the BHS appears to have excellent predictive validity. Based on the results of several longitudinal studies involving suicidal patients, Beck and his colleagues reported that a score of 9 or more on the BHS identified 94% of the patients who ultimately completed suicide (Beck, Steer, Kovacs, & Garrison, 1985; Beck, Brown, Berchick, Stewart, & Steer, 1990).

A *General Attitudes Scale (GAS)* was developed for the present study to measure the degree to which each participant endorsed positive or negative attitudes about themselves, others (in general), his/her future, life, and death. Participants were asked to rate their attitudes (over the past weeks) for each of these categories using a Likert-type scale, where 1= extremely negative, and 7 = extremely positive. A copy of this new measure is provided in Appendix C.

The psychometric properties of the GAS have yet to be fully established. For the current sample, the first four items, those that represented positive appraisals of self, other, future, and life all yielded significant positive inter-item correlations ranging from .39 to .62 at (p< .01). The estimate of internal consistency for these first 4 items was .81. The positive appraisal of death demonstrated only one significant correlation, that being a negative correlation with positive appraisal of other (r = -.11, p< .05). In terms of concurrent validity, it is notable that the positive appraisals of life (GAS-L) and of future (GAS-F) both demonstrated significant negative correlations with the BHS, with coefficients of (r = -.57, p< .01) and (r = -.63, p< .01), respectively.

Cognitive Deficits The *Social Problem-Solving Inventory-Revised* (SPSI; D'Zurilla, Nezu, & Maydeu-Olivares, 1995, 1998) was utilized in the present study to assess each participant's problem-solving ability. The SPSI is a 25-item self-report questionnaire comprised of five scales including: (1) *Positive Problem-Solving Orientation* (SPSI-PPO: a measure of positive problem-solving set), (2) *Negative Problem-Solving Orientation* (SPSI-NPO: is a measure of a dysfunctional or inhibitive problem-solving style), (3) *Rational Problem Solving Scale* (SPSI-R: evaluates the deliberate, rational, and systematic application of effective problem-solving strategies and techniques), (4) *Impulsivity/Carelessness Problem-Solving Scale* (SPSI-I: evaluates hasty attempts at problem-solving in the absence of planned and thoughtful deliberation), and (5) *Avoidant Problem Solving Scale* (SPSI-R-A: assesses the tendency to avoid engaging in active problem-solving. For each of the 25 items on the SPSI-R, participants are asked to indicate on a

five-point Likert–type scale (ranging from 0=*"Not at all true of me"* to 4=*"Extremely true of me"*) how they typically respond to problems in general. Each scale score may range from 0 to 20.

Adequate levels of reliability have been established for the SPSI-R. Estimates of internal reliability of .75, .65, and .80 have been reported for the SPSI-PPO, SPSI-I, and SPSI-A scales, respectively (Gomez-Benito, & D'Zurilla, 2000; Maydeu-Olivares, Rodriguez-Fornells, Gomez-Benito, & D'Zurilla, 2000). Estimates of scale reliability range from .78 to .96 for the SPSI-NPO scale and from .78 to .90 for the SPSI-R scale (D'Zurilla, & Nezu, 1990; Maydeu-Olivares et. al., 2000; Robichaud & Dugas, 2005; Sadowski, Moore, & Kelley, 1994). In the current sample, the Cronbach's alpha was (α = .74) and (α = .82) for the SPSI-R and SPSI-A, respectively.

When assessing construct validity, researchers have found that within clinical populations, SPSI-R scores are correlated with hopelessness and an increased risk of suicidal behavior (Faccini, 1992). Further, researchers have reported that SPSI-R scores have utility for discriminating between suicide attempters and both non-suicidal psychiatric patients and non-suicidal controls (Fitzpatrick, Witte, & Schmidt, 2005; Sadowski & Kelley, 1993).

In the present study, only two of the scales of the SPSI were utilized as indicators of problem-solving deficits in the proposed model. These two scales, which included the SPSI-R and the SPSI-A, were selected for use in the current study as previous research has demonstrated a significant relationship between suicidal thinking and behavior and ineffective problem-solving and problem-solving avoidance. The SPSI-PPO and SPSI-NPO were not utilized in the current study for two reasons. First, both of these scales include an affective component, and could potentially cause problems in terms of the identification of the model in the structural equation modeling analysis. In addition, the SPSI-PPO and SPSI-NPO scales assess positive attitudes and negative attitudes about personal problem-solving, respectively. Consequently, these two scales are not

pure measures of self-reported problem-solving per se, and in fact are more a measure of cognitive distortions than of cognitive deficits.

The *Embedded Figures Test* (EFT) was administered to assess each participant's field-dependence/independence (i.e., cognitive rigidity/flexibility). The EFT (Oltman, Witkin, Raskin, & Karp, 1971) consists of 18 simple geometric figures, the first two of which are used for practice. After the two practice trials, the participant is presented with each of the remaining sixteen figures one at a time. Beside each simple figure is a more complex geometric design, with the simple figure embedded within it. Using a felt-tipped marker, the participant was asked to outline the embedded figure as quickly as possible, while the administrator of the test timed each response individually. One point is given for each correct response, with a total possible score of sixteen for the complete test. The total number of correct responses and the total time to complete all correct responses were calculated. The mean time per correct response was then calculated, and this value represents the participant's score on the test. Higher mean scores are associated with field-dependence (i.e., difficulty in overcoming field embeddedness) and, as such, represent a deficit in cognitive flexibility. Good levels of reliability (parallel forms; $r = .82$) have been established for the EFT (Oltman et al., 1971). Research examining the construct validity of this test has established that high measures of field-dependence are associated with measures of cognitive rigidity and an intolerance of ambiguity (Witkin, 1965).

Affect

Positive and Negative Affect Scale (PANAS; Watson, Clark & Tellegen, 1988). The PANAS, a 20-adjective self-report checklist, was used in Study 1 to assess each participant's level of reported affect. The PANAS measures two different mood factors. High Positive Affect (PA) is characterized by enthusiasm, alertness and a high level of activity. In contrast, low PA is associated with lethargy and sadness. High Negative Affect (NA) is associated with subjective

distress, anxiety, guilt and anger, whereas low NA is characterized by serenity and calmness (Watson et al., 1988). Participants were asked to indicate the extent to which each adjective characterized his/her feelings in general (over the past 4 weeks) on a Likert scale ranging from 1 (not at all) to 5 (extremely). A total PA score and a total NA score were calculated for each of the participants, with a possible range from 10 (lowest) to 50 (highest) for each of the two dimensions. Watson and associates (1988) have reported high levels of internal consistency for both the PA (α =.86-.90) and the NA (α =.84-.87) scales. Acceptable test-retest reliabilities of .68 and .71 have been reported for the PA and NA scales respectively (Watson et al., 1988). Adequate discriminant and convergent validity have also been reported (Watson et al., 1988). In the current sample, the estimate of internal consistency was (α = .88) for the PA and (α = .87) for the NA.

Self-Directed Anger was assessed in the current study by having the participants indicate on a Likert-type scale the degree to which they were experiencing self-directed anger from 1 (not at all) to 5 (extremely). This new item was added to the end of the PANAS measure. The revised PANAS measure is presented in Appendix D.

Rumination

The *Global Rumination Scale* (GRS; McIntosh, Harlow, & Martin, 1995) was administered in Study 1 to assess each participant's tendency to engage in ruminative thinking. The GRS is comprised of ten self-report items (e.g., "Sometimes I feel like I have no control over my thoughts"), six of which are positively keyed. The participant indicates the degree to which a given item applies to him/her using a seven-point Likert-type response scale ranging from ("Does not Describe Me Well") to ("Describes Me Well"). As such, scores on the measure can range from 0 to 60, with high scores representing high levels of cognitive rumination. The psychometric properties of the GRS have not yet been examined extensively. To date, researchers have reported a two-week test-retest reliability coefficient of .78 for the GRS (McIntosh, Harlow, & Martin, 1995). Cronbach's alpha

of .63 has also been reported for a sample of 118 undergraduate students (Brinker, 2007). In the current undergraduate sample Cronbach's alpha was .65).

Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991). The 22-item Ruminative Responses scale subscale of the RSQ was also used in the present study to assess the respondent's tendency to engage in ruminative thinking. For each statement, respondents indicate how often they engage in each behavior, using the following scale: "Almost never", "Sometimes", "Often", or "Almost Always". All scores on the scale range from 22 to 88. The RRS scale of the RSQ has demonstrated adequate test-retest reliability (Nolen-Hoeksema, Parker, & Larsen, 1994) and convergent and predictive validity (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema, & Morrow, 1991). Cronbach's alpha in the current sample was .92.

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ is a 16 item self-report questionnaire that measures the tendency to engage in ruminative worry. Participants were asked to indicate how typical each characteristic was of them using a Likert-type scale, where 1 = "Not at all typical" to 5 = "Very typical". Totals scores can range from 16 to 80, with higher scores indicating a higher tendency to worry. Researchers have reported that the PSWQ is unifactorial and demonstrates adequate reliability (Davey, 1993) and validity (Meyer et al., 1990). In the current undergraduate sample Cronbach's alpha was .94.

Ambivalence

The *Raulin Intense Ambivalence Scale* (RIAS) is a 45-item True-False self-report questionnaire that was designed to measure an individual's degree of ambivalence. The construct of ambivalence has been defined as the state of simultaneously holding both positive and negative attitudes and/or feelings towards the same object or activity (Raulin, 1984). Statements on the RIAS include items such as: "Love and hate tend to go together" and "I doubt that I can ever be sure what my true interests are." Related to suicide, this ambivalence embodies the individual's

indecision about choosing life or choosing death: two mutually exclusive options. Scores on the RIAS may range from 0 to 45, with higher scores indicating a higher level of ambivalence. The RIAS has demonstrated excellent internal consistency, with alphas ranging from .86 to .94 (Raulin, 1984). In the current sample Chronbach's alpha was .91.

Procedure

Participants were informed that the purpose of the present study was to examine the relationship between cognitive and affective processes and suicidal thinking. However, the participants remained experimentally naive with regards to the specific hypotheses. All participants completed an informed consent (see Appendix E) and then were instructed to carefully read the instructions and to answer the self-report questionnaires in the order in which they were presented in the envelope. (When compiling the measures for the study, the demographic information sheet was completed first, and all measures were randomized to control for any order effects). Although small groups of individuals simultaneously completed the study, each participant worked privately and independently on his/her own questionnaires. Each participant was asked in turn to accompany the investigator to an adjoining room to complete the Embedded Figures Test, and then returned to complete the questionnaires. Each participant earned one credit towards a research component of an introductory Psychology course for participating in the study. Upon completion of the questionnaires, each subject was thanked for their participation in the study and debriefed. The Feedback sheet is presented in Appendix F. At this time, any additional questions and concerns were also addressed and participants were given a list of community mental health support resources. This list of community resources is presented in Appendix G. It should also be noted that any participant that endorsed current suicidal thinking was contacted by the investigator by telephone the day after completion of the session. In the event that the participant reported distress, referrals would then be made to qualified mental health care providers.

Results

Model Assessing the Relationship between Affect, Cognitive Deficits and Distortions, and Suicide Ideation

A fundamental goal of this thesis involved investigating the fit of the proposed model of suicidal ideation. Based on the results of a literature review, it was hypothesized that affect, cognitive deficits, cognitive distortions, and rumination would be related through a direct and reciprocal interaction, and that these three factors would interact to produce suicide ideation. It was expected that cognitive distortions would have a stronger impact than cognitive deficits on suicide ideation. A pictorial representation of this hypothesized model was presented in Figure 2. (Please see page 31).

Structural Equation Modeling: An Overview

Structural Equation Modeling [SEM] was utilized to assess the integrity of the proposed model in Study 1. SEM is a statistical technique which utilizes a combination of confirmatory factor analysis and path regression to test hypotheses about the relationships among latent and observed variables. In general, a number of different indices are typically used to assess the adequacy of any given hypothesized model when using SEM. One of these, the Chi-Square [χ^2] test, is an overall test of fit between the fitted and sample covariance matrices. For the Chi-Square test, smaller values are associated with a better fit between the matrices, with values of zero indicating a perfect fit between the data and the hypothesized model. Despite the popularity of this test, several limitations are associated with the Chi-Square test. For example, increased power of the test and associated increases in sample size may result in rejection of the specified model (i.e. statistical significance), even in cases where the difference between fitted model and sample covariance matrices is trivial (Bentler, 1990; Gardner, 1999).

As a result of the limitations associated with the Chi-Square test, several other indices have been developed for assessing the goodness of fit of the tested models. In general, these indices are derived from the comparison of the fit of a null model and the fit of a specified or proposed model, where the null model represents a model in which no relationships are specified between variables (Hoyle. 1995). Several goodness of the fit indices are reported with SEM output. The goodness of fit index [GFI] represents an estimate of the "weighted proportion of variance in the sample covariance matrix accounted for by the estimated population covariance matrix" (Tabachnick & Fidell, 1996, p.750). The GFI may assume a value between zero and one, and there is a general consensus in the literature that a goodness of fit index which exceeds .90 is indicative of a good fit between the hypothesized model and any data set (Byrne, 1994; Hoyle, 1995).

Other fit indices, such as the comparative fit index [CFI] (Bentler & Bonett, 1980: Bentler, 1990) are considered to be relative fit indices, as they assess the fit of the model when compared to other possible models. As with GFI values, CFI values that exceed .90 are considered to be indicative of a good fitting models (Bentler, 1995).

Still other fit indices are based on residuals. One residual based fit index is the root mean square residual (RMSR), the mean differences between the estimated population variances and covariances and the sample variances and covariances. A good fit between the data and the hypothesized model should yield small RMSR values. A similar index, the Root Mean Square Errors of Approximation (RMSEA) is a discrepancy index relative to degrees of freedom. There is general agreement in the relevant literature that a RMSEA value between .05 and .10 is indicative of an adequate fit between the proposed model and the data set (Bentler & Bonett, 1980; Loehlin, 1998; Maruyama, 1998). Further, the RMSEA is considered to be an index of the relative fit of two non-nested models, as this index adjusts for the number of parameters and degrees of freedom (Maruyama, 1998). Essentially, RMSEA allows for the ordering of the fit of various non-nested

models when utilizing the same data set, with smaller RMSEA values being associated with better fitting models.

Hoyle (1995) recommended that it is important to consider both the Chi-Square test and the adjunct fit indices, when assessing the adequacy of fit between the hypothesized model and the obtained data set. There is a general consensus in the literature that a hypothesized model may be considered adequate if either the Chi-Square test is non-significant, or if the goodness of fit indices exceed the value of .90 (Byrne, 1994; Hoyle, 1995).

Modification Indices

A Chi square difference test can be used in order to test whether a smaller model nested within the larger model has a significantly better fit than the initially tested larger model. The Chi-Square difference test is calculated by subtracting the Chi-Square of the nested model from the Chi-Square of the larger model, and determining whether this new Chi-Square value is significant at degrees of freedom equal to the difference in degrees of freedom between the initial model and the nested model (Tabachnick & Fidell, 1996). If the Chi-Square is significant, the nested model is considered to have a significantly better fit than the initial model.

Assessing the Measurement Model for the Full Model in Study 1

Statistics for the tested model, including the standardized regression weights for the indicators of the latent variables, as well as the standardized path regression coefficients are presented with the model in Figure 4. In the tested model, all indicators of *Cognitive Distortions* loaded significantly onto the factor, with BHS (.75, $p < .001$) loading in a positive direction, and GAS-S (-.76, $p < .001$), and GAS-F (-.80, $p < .001$) loading in a negative direction. For the *Cognitive Deficits* factor, SPSI-R (-.27, $p < .001$) loaded negatively, while SPSI-A (.55, $p < .001$) loaded positively. Although EFT-Mean loaded in positive direction (.08, ns) onto the *Cognitive Deficits* factor, the standardized regression weight was very low and was not significant.

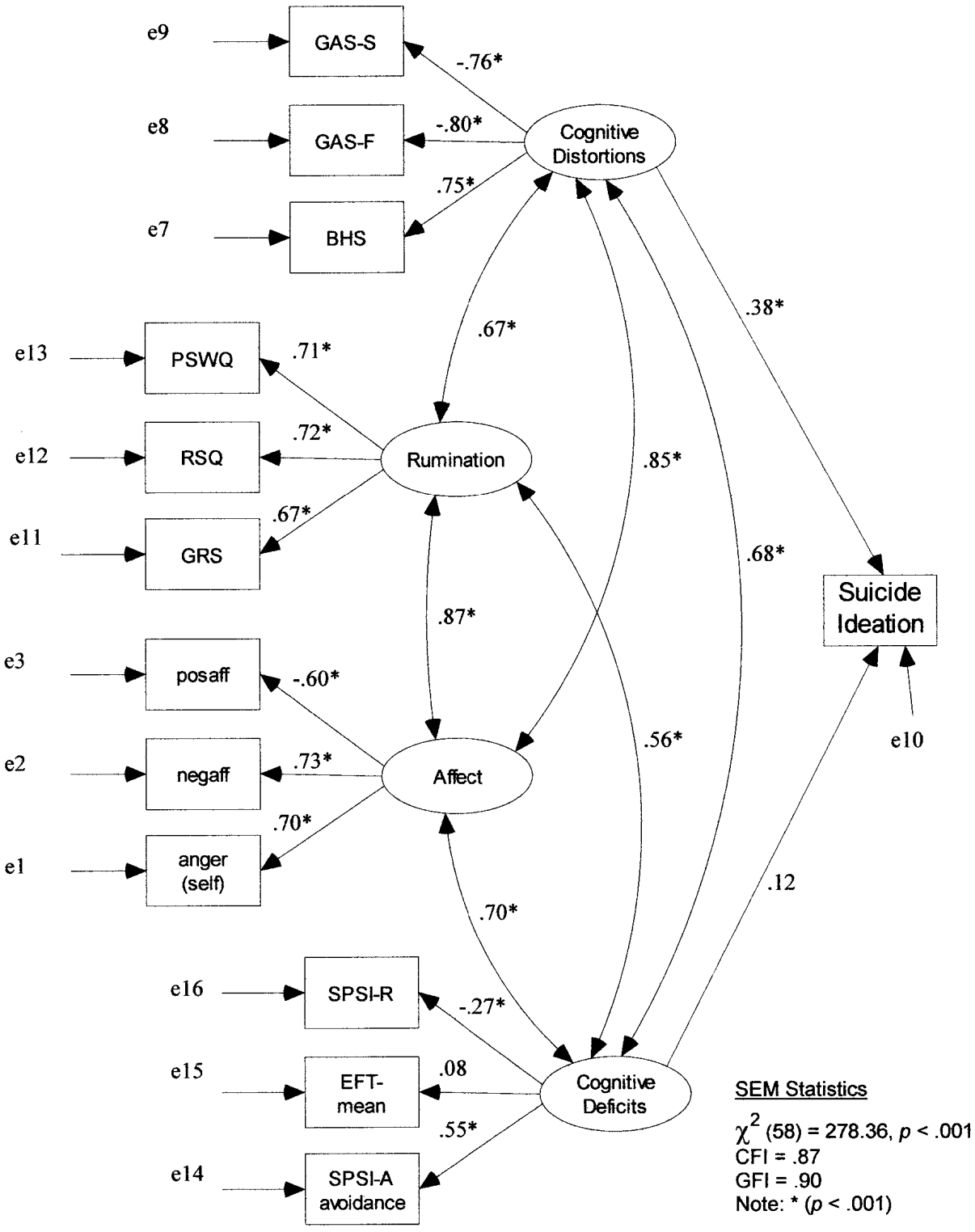


Figure 4: SEM Statistics for the Integrated Cognitive-Affect Model of Suicidal Thinking- First Phase

Note: Suicide Ideation = BSS Total score: GAS-S = General Attitudes Scale-Self; GAS-F = General Attitudes Scale-Future; BHS = Beck Hopelessness Scale; PSWQ = Penn State Worry Questionnaire; RSQ = Response Styles Questionnaire; GRS = Global Rumination Scale; Posaff = PANAS-PA; Negaff = PANAS-NA; SPSI-R = Social Problem-Solving Inventory-Rational problem-solving; EFT-mean = Embedded Figures Test-mean time; SPSI-A = Social Problem-Solving Inventory-Avoidant problem-solving.

The latent variable *Affect* was well defined in the model, with both negative affect (.73, $p < .001$) and self-directed anger (.70, $p < .001$) loading positively onto the *Affect* factor.

Further, *Rumination*, was also well defined in the model, with GRS (.67, $p < .001$), PSWQ (.71, $p < .001$), and RSQ (.72, $p < .001$) all contributing significantly to the factor in a positive direction. Overall, an inspection of the SEM output for the measurement model indicated that the latent variables, *Cognitive Distortions, Affect*, and *Rumination* were all well defined in terms of the selected indicators. However, the *Cognitive Deficits* factor was associated with some misspecification, as the measure of cognitive rigidity (EFT-mean) did not load well with the two measures of problem-solving.

Assessing the Fit of the Full Proposed Model in Study 1

A maximum likelihood estimation (ML) structural equation modeling technique was utilized to assess the fit of hypothesized model in the current study. The Chi-Square was significant ($\chi^2_{(58)} = 278.37$, $p < .001$). Ideally, as mentioned previously, the Chi-Square value should be small and non-significant. However, there is agreement in the literature that Chi-Square values are highly impacted by large sample sizes (Byrne, 1994). This is considered to be especially problematic in studies where the sample size divided by ten (N/10) exceeds the number of parameters to be estimated in a given model. Such is the case in the current study. Given that the large sample size in the current study may have artificially inflated the Chi-Square value, the other available fit indices were also examined. The CFI for the tested model was (.87). Although this estimation of comparative fit does not exceed the desired CFI value of .90, it is close to an acceptable value. Further, the GFI for the tested model was .90 indicating that there is a good fit between the proposed model and the data in the current sample. The resulting GFI value of .90 can be

interpreted as an indication that the variance in the proposed model accounted for 90% of the variance in the estimated population covariance.

When assessing the fit of a proposed model, it is also important to consider the residual fit indices to determine whether there is appreciable variance/covariance in the data that is not adequately accounted for the relationships in the model. The resulting RMSEA from the tested model was .09, which falls near the upper end of the acceptable range of values suggested by Bentler and Bonett (1980) and Loehlin (1998).

When considered together, the results of the SEM analysis suggested a fit between the hypothesized model and the data set that was close to adequate, with the model accounting for 90% of the variance in the data set. The model was associated with an acceptable margin of residual error. As was predicted, all of the latent variables in the model were significantly correlated, indicating that they all have reciprocal relationships. Further, as was hypothesized, cognitive distortions directly impacted suicide ideation (standardized coefficient = .38, $p<.001$), but cognitive deficits did not (standardized coefficient = .12, ns). However, the fact that the cognitive deficits factor was significantly correlated with cognitive distortions ($r = .68$, $p<.001$), affect ($r = .70$, $p<.001$), and rumination ($r = .56$, $p<.001$), would suggest that cognitive deficits do contribute to suicide ideation, but in an indirect manner through reciprocal relationships with the other latent variables in the model.

Cognitive Distortions & Deficits Model

In the interest of determining the most parsimonious model, the fit of a second model was assessed. This second model is similar to the initially proposed model as cognitive distortions are expected to have a direct impact on suicide ideation, while cognitive deficits are expected to have little impact on suicide ideation. The second model differs from the initially proposed model though, as the underlying processes of affect and rumination have been omitted. In the revised model, the

latent variables, *Cognitive Distortions* and *Cognitive Deficits* are defined in terms of the same indicators that were used in the previous model (see figure 5).

Assessing the Measurement Model

Statistics for the simplified cognitive deficits and distortions model are presented in Figure 6. As was the case with initially tested model, for the simplified model, all indicators of *Cognitive Distortions* loaded significantly onto the factor, with BHS (.77, $p< .001$) loading in a positive direction, and GAS-S (-.72, $p< .001$), and GAS-F (-.83, $p< .001$) loading in a negative direction. For the *Cognitive Deficits* factor, SPSI-R (-.30, $p< .001$) loaded negatively, while SPSI-A (.50, $p< .001$) loaded positively. As was the case with the initial model, EFT-Mean loaded in positive direction (.09, ns) onto the *Cognitive Deficits* factor, but the standardized regression weight was very low and was not significant.

Assessing the Fit of the More Parsimonious Cognitive Distortions and Deficits Model

A maximum likelihood estimation (ML) structural equation modeling technique was utilized to assess the fit of the simplified cognitive deficits and distortions model. The Chi-Square ($\chi^2_{(12)} = 22.50$, $p< .05$) of the simplified model was much smaller and less significant than the initially proposed model, indicating a closer fit between the hypothesized model and the data set. The adjunct fit index (CFI = .98) indicated a near perfect fit between the revised model and the data set. Further, the GFI of .98 suggested that the simplified model accounts for a very large proportion of the variance. Further, the RMSEA (.047) for the revised model is well within the acceptable range of residual values. Considered together, these results would suggest that the simplified model is not only a better fitting model, but also accounts for a greater proportion of the variance and is associated with less residual error than the initially proposed more complex model.

Inspection of the standardized regression weights indicated that *Cognitive Distortions* (standardized coefficient = .41, $p<.001$) had a direct impact on suicide, whereas *Cognitive Deficits*

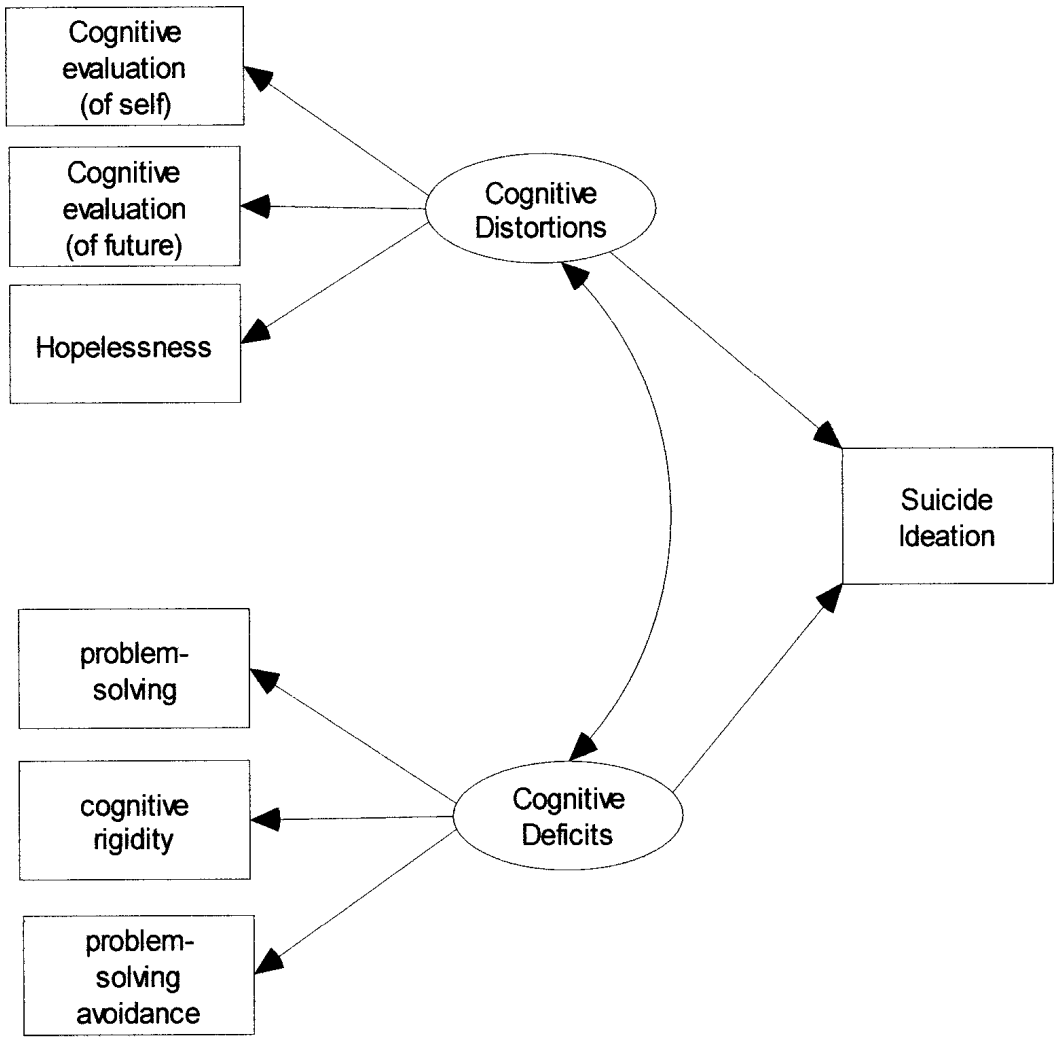
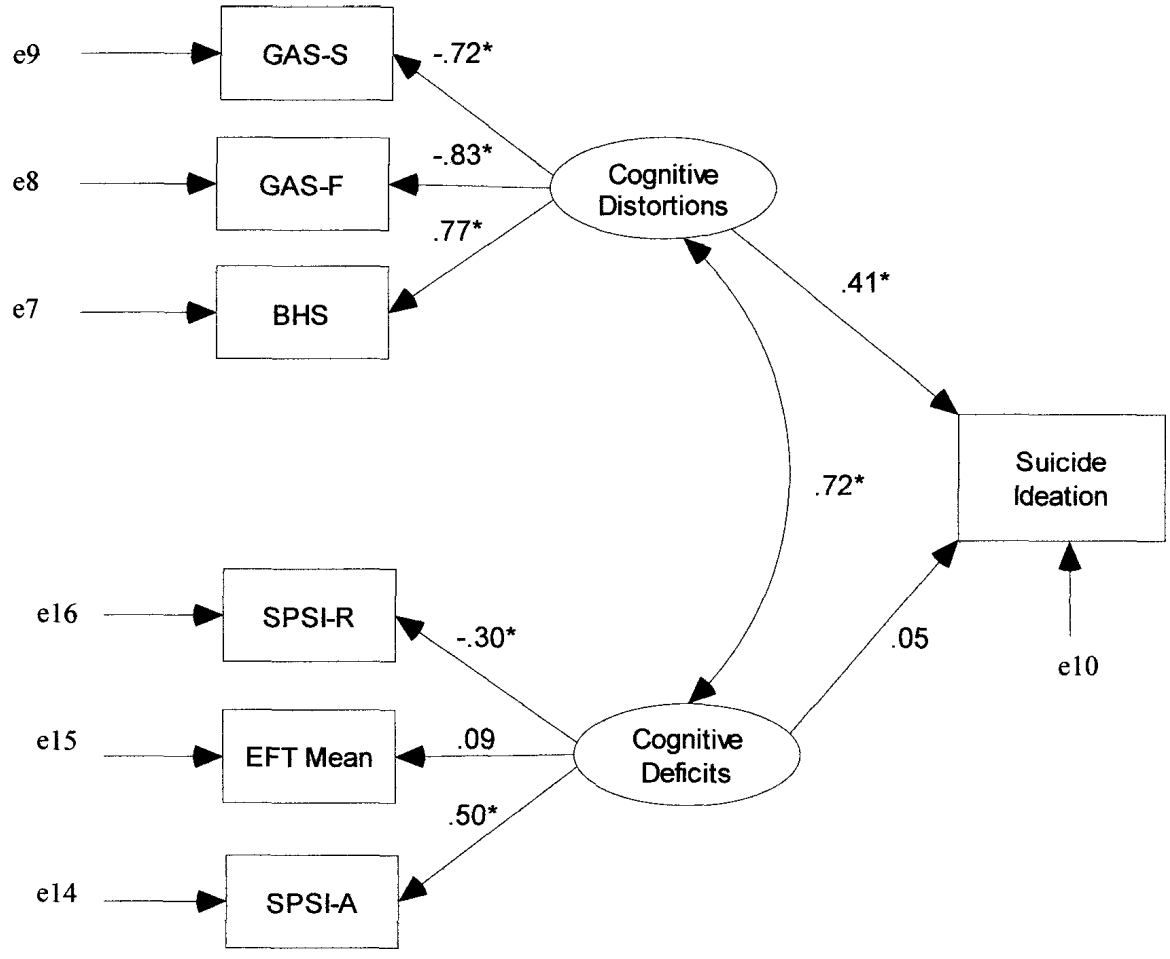


Figure 5: A Modified Cognitive Distortions and Cognitive Deficits Model of Suicidal Thinking



SEM Statistics

χ^2 (12) = 22.50, $p < .05$
CFI = .98
GFI = .98
RMSEA = .047
Note: * = p < .001

Figure 6: SEM Statistics for the Modified Cognitive Distortions and Cognitive Deficits Model of Suicidal Thinking

Note: Suicide Ideation = BS Total Score; GAS-S = General Attitudes Scale-Self; GAS-F = General Attitudes Scale-Future; BHS= Beck Hopelessness Scale; SPSI-R = Social Problem-Solving Inventory – Rational problem-solving; EFT-mean = Embedded Figures Test-mean time; SPSI-A = Social Problem-solving Inventory-Avoidant problem-solving

did not directly impact suicide ideation (standardized coefficient = .05, ns). It is notable though, that *Cognitive Deficits* had a significant positive correlation with *Cognitive Distortions* (r = .72, p<.001). As with the initially assessed model, this pattern of findings would suggest that cognitive distortions have a direct impact on suicide ideation and that cognitive deficits have an indirect impact on suicide ideation through their impact on cognitive distortions.

There is a general consensus in the literature that post hoc model fitting should be kept to a minimum (Byrne, 1994; Maruyama, 1998). But as was previously discussed, it is possible to make some post hoc adjustments to the model by assessing nested models within an original model to determine if these changes improve the overall fit of the model. Given that *Cognitive Deficits* did not directly impact suicide ideation, it was possible that eliminating this path would improve the overall fit of the model. To investigate this possibility, the model was modified such that the regression weight from *Cognitive Deficits* to suicide ideation was set to zero.

Pursuant to making this adjustment, the new SEM results indicated that eliminating the path from *Cognitive Deficits* to suicide ideation did not improve the overall fit of the cognitive deficits and distortions model. The resulting Chi-Square value actually increased to a value of ($\chi^2_{(13)}$ = 22.60, p< .05). Although this change is not significant ($\Delta\chi^2$ [1, N = 397] = .10, *ns*), it marginally decreases the overall fit of the model, rather than increasing the goodness of fit. Further, eliminating the path from cognitive deficits to suicide ideation did not result in any appreciable increases in the other adjunct fit indices. Subsequent to the elimination of the *Cognitive Deficits* to ideation path, the resulting CFI was (.98) and the GFI was (.98). These resulting values are the same as the initial fit indices that were observed prior to the elimination of the deficits to ideation path. Consequently, the elimination of the path between *Cognitive Deficits* and suicide ideation did not improve the overall fit of the model. The only notable improvement that resulted from eliminating the path from *Cognitive Deficits* to suicide ideation was a small decrease in the RMSEA

value (.04) indicating that this modification provided a slight decrease in the estimate of residual error. Overall, these resulting fit indices are not indicative of a relatively better fit in the model, and thus, do not support the elimination of the path from *Cognitive Deficits* to suicide ideation.

Considered together, the results of the SEM analyses for the simplified Cognitive Deficits and Distortions model (Figure 6) indicate that cognitive distortions have a direct significant effect on suicide ideation. Further, cognitive distortions and cognitive deficits have a significant reciprocal relationship. As was predicted, cognitive distortions had a much stronger impact on suicidal thinking than did cognitive deficits. However, cognitive deficits do have an indirect effect on suicide ideation through their impact on cognitive distortions. This pattern was evident in both the more complex model that integrated affect and rumination, as well as the simplified model that integrated only cognitive deficits and cognitive distortions. The relative strengths of the full model and the simplified model are discussed further in a subsequent section.

Differences between Non-ideators and Ideators

To further investigate the validity of the proposed relationships in the tested model, a secondary goal of Study 1 involved determining whether the suicide ideating group differed significantly from a group of non-ideators in terms of cognitive distortions, cognitive deficits, affect, and rumination. Consistent with the predicted relationships in the proposed model, moving across the continuum from non-ideating to ideating, rumination and negative affect was expected to increase, whereas positive affect was expected to decrease. Concomitant with these changes, cognitive distortions were expected to increase as well. In contrast, cognitive deficits were expected to change minimally moving across the continuum between non-ideating to ideating groups. Ultimately, individuals who are at risk of suicide ideation will need to be followed over time, to determine if these variables change as predicted, across the suicide continuum over time. Given the practical constraints of Study 1, it was not possible to assess changes in the variables over

time. Instead, a group of ideators was compared to a group of non-ideators to determine if these variables differed as predicted among these two groups.

For the purposes of this analysis, a smaller sub-sample of the participants in the first study was selected. All 32 individuals who were currently ideating were included in this smaller sub sample, as were a group of 32 non-ideators who were randomly selected from the 365 non-ideators in the sample from Study 1. Both the ideator and non-ideator groups in the smaller sub sample were comprised of 4 males and 28 females. For both groups the age of the participants ranged from 17 to 21, with a mean age of 18.75 and 18.38, for the ideators and non-ideators, respectively. Marital status and completed education were very similar for both groups. The demographic information for this smaller random sample is presented in Table 3, and the descriptives for the measures from this smaller sub-sample are presented in Table 4. To determine if any of these mean scores differed significantly between the ideating and non-ideating groups, an independent samples t-test was performed. The t-values and associated significance levels are presented in Table 4. As the Levine's test for equality of variances was significant for the variables included in the analysis, homogeneity of variance was not assumed.

The results of the t-test indicated that with few exceptions the means differed significantly at a level of ($p < .001$). The two measures that did not differ significantly were two of the cognitive deficit measures (i.e., rational problem-solving and cognitive rigidity). The results of the t-tests provide strong evidence that ideators differ significantly from non-ideators, in terms of cognitive distortions, affect, and rumination, as well as self-reported avoidant problem-solving.

Three additional measures which included how positively the participants evaluated life (GAS-L) and death (GAS-D), as well as a measure of ambivalence (RIAS) were also included in the t-test. Although these measures were not included as indicators in the model, as was outlined

Table 3:
Study 1: Demographic Characteristics of the Smaller Sub-sample of Ideators and Non-Ideators

		NON-IDEATORS		IDEATORS	
		Frequency	Percent	Frequency	Percent
Sex	Male	4	12.5	4	12.5
	Female	28	87.5	28	87.5
Age	Under 21	32	100.0	32	100.0
Marital Status	Single	32	100.0	32	100.0
Children	No	32	100.0	32	100.0
Education Level Completed	High School	32	100.0	32	100.0
Employment	None	32	100.0	28	87.5
	Part-Time	0	0.0	4	12.5
Suicide Ideation/ Behavior	Non-Ideation	32	100.0	0	0.0
	Suicide Ideation	0	0.0	32	100.0
	Past Suicide Attempts	1	3.1	5	15.6
	No Past Attempts	31	96.9	27	84.4
Total participants per sample:		32.00		32.00	
Mean Age per Sample:		18.38		18.75	
Standard Deviation (Age) per Sample:		0.91		1.24	

Table 4:
Study 1: Descriptive Statistics and t-test Statistics for Indicators in the Ideator & Non-Ideator Groups in Small Sub-Sample

	Non-Ideators			***Ideators***			***t-test Results***	
	N	**Mean**	**S.D.**	**N**	**Mean**	**S.D.**	**t**	**Sig.**
Suicide Ideation								
BSS Total	32	0.09	0.71	32	9.81	5.72	-9.59	.001
Cognitive Distortions								
BHS	32	2.13	2.46	32	6.56	5.11	-4.65	.001
GAS-S	32	5.41	1.07	32	3.69	1.84	4.57	.001
GAS-O	32	5.75	1.02		4.44	1.68	3.78	.001
GAS-F	32	5.72	1.05	32	4.19	1.71	4.31	.001
GAS-L	32	6.34	.87	32	3.81	1.87	6.94	.001
GAS-D	32	2.53	1.24	32	3.78	1.16	-4.16	.001
Cognitive Deficits								
EFT-Mean Time	32	3.79	0.96	32	4.12	1.79	-0.91	*ns*
SPSI-R	32	10.71	3.63	32	10.47	3.38	.284	*ns*
SPSI-A	32	4.50	3.18	32	8.50	4.10	-4.36	.001
SPSI-PPO	32	11.97	3.37	32	10.66	3.62	-	-
SPSI-NPO	32	7.03	3.51	32	10.00	5.05	-	-
SPSI-I	32	5.28	3.70	32	7.06	4.58	-	-
Affect								
PANAS-PA	32	36.38	4.79	32	26.19	8.98	5.66	.001
PANAS-NA	32	20.91	5.24	32	29.25	10.18	-3.93	.001
Anger (Self-Directed)	32	1.94	1.06	32	3.13	1.16	-3.61	.001
Rumination								
GRS-Total	32	34.19	7.53	32	40.78	8.08	-3.38	.001
PSWQ-Total	32	44.43	12.88	32	59.78	15.32	-4.31	.001
RSQ-Total	32	40.06	10.39	32	59.72	13.25	-6.64	.001
Ambivalence								
RIAS	32	3.16	2.73	32	17.25	8.42	-9.01	.001

NOTE: All of the statistics in Table 4 represent values where equal variances were not assumed.

BSS total = Beck Scale for Suicide Ideation; BHS = Beck Hopelessness Scale; GAS-S = General Attitudes Scale-Self Orientation; ; GAS-O = General Attitudes Scale-Other Orientation; GAS–F = General Attitudes Scale-Future Orientation; GAS–L = General Attitudes Scale-Life Orientation; GAS–D = General Attitudes Scale-Death Orientation; EFT-Mean time = Embedded Figures Test-Mean time per correct response; SPSI-R = Social Problem-Solving Inventory- Rational; SPSI-A = Social Problem-Solving Inventory-Avoidant style; SPSI-PPO = Social Problem-Solving Inventory-Positive Problem-Solving Orientation; SPSI-NPO = Social Problem-Solving Inventory-Negative Problem-Solving Orientation; SPSI-I = Social Problem-Solving Inventory-Impulsive style; PANAS-PA = Positive and Negative Affect Scale-Positive affect; PANAS-NA = Positive and Negative Affect Scale-Negative affect; GRS-Total = Global Rumination Scale-Total score; PSWQ-Total = Penn-State Worry Questionnaire- Total score; RSQ-Total = Response Style Questionnaire total (22-item Ruminative Responses Scale); RIAS = Raulin's Intense Ambivalence Scale.

in the introduction, they were expected to differ significantly between ideators and non-ideators, and ultimately between ideators and attempters as well. As predicted, the results of the t-test indicated that ideators rated life more negatively, death more positively, and were more ambivalent than non-ideators. Further, all differences were significant at $p<.001$.

Prediction of Suicide Ideation

The final phase of the first study involved assessing the relative utility of each of the indicators in the model as single predictors of suicide ideation. In the current study, hopelessness was expected to have superior predictive utility as this factor has consistently been identified as the single best predictor of suicide in the extant suicidology literature (Stephenson, Pena-Shaff, & Quirk, 2006; Beck, Steer & McElroy, 1982). Previous research has never simultaneously included the same combination of factors that are integrated into the current model. Given that the predictive utility of any given measure is considered relative to the other indicators included in regression analyses (Gardner, 1998), it was difficult to predict, with any degree of certainty, whether any of the other indicators in the model will enhance the prediction of suicide ideation over and above hopelessness.

As was previously discussed, researchers have reported that cognitive distortions are more typically associated with internalizing disorders than are cognitive deficits. Consequently, in Study 1, it was hypothesized that cognitive distortions would have greater utility in predicting suicide ideation than would cognitive deficits.

The relationship between suicide ideation and each of the indicators in the model was calculated using a bivariate correlation analysis. The resulting correlation matrix is presented in Table 5. Although two of the cognitive deficit indicators (problem-solving and cognitive rigidity) were not significantly related to suicide ideation, all other indicators demonstrated significant correlations with the measure of suicide ideation. A further inspection of this correlation matrix

Table 5:
Study 1: Correlation Matrix of all Measures in the Hypothesized Model in the Full Sample

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. BSS Total	-	.41**	- .29*	- .34**	.08	-.03	.21**	- .33**	.31**	.21**	.20**	.24**	.38**	.41**
2. BHS		-	- .53**	- .63**	.06	-.16**	.33**	- .56**	.35**	.39**	.32**	.36**	.41**	.53**
3. GAS-S			-	.62*	- .02	-.48**	- .21**	.53**	- .48**	- .52**	-.30**	-.42**	-.40**	-.47**
4. GAS-F				-	- .03	-.20**	- .28**	.51**	- .41**	-.42**	-.32**	-.37**	-.32**	-.40**
5. EFT-Mean					-	-.01	- .07	-.10*	- .05	-.05	-.06	-.01	-.01	-.04
6. SPSI-R						-	.15**	.32**	- .06	-.07	-.04	-.06	.01	-.10*
7. SPSI-A							-	- .26**	- .31**	.22**	.23**	.21**	.27**	.46**
8. PANAS-PA								-	-.31**	-.35**	-.26**	-.34**	-.35**	-.41**
9. PANAS-NA									-	.63**	.43**	.54**	.49**	.47**
10. Anger (Self-Directed)										-	.36**	.42**	.44**	.43**
11. GRS-Total											-	.50**	.52**	.41**
12. PSWQ-Total												-	.46**	.45**
13. RSQ-Total													-	.49**
14. RIAS														-

NOTE: * = $P<.05$; ** = $P<.01$; N=397

BSS total = Beck Scale for Suicide Ideation; BHS = Beck Hopelessness Scale; GAS-S= General Attitudes Scale-Self Orientation; GAS-F = General Attitudes Scale-Future Orientation; PANAS-PA = Positive and Negative Affect Scale-Positive affect; PANAS-NA = Positive and Negative Affect Scale-Negative affect; EFT -Mean time = Embedded Figures Test-Mean time per correct response; SPSI-R = Social Problem-Solving Inventory- Rational; SPSI-A = Social Problem-Solving Inventory-Avoidant Problem-Solving Orientation; GRS-Total = Global Rumination Scale-Total score; PSWQ-Total = Penn-State Worry Questionnaire- Total score; RSQ-Total = Response Style Questionnaire -Total score; RIAS = Raulin's Intense Ambivalence Scale.

indicated that the two variables with strongest linear relationships with suicide ideation (BSS) were the participant's level of hopelessness, (BHS; $r = .412$, $p < .0001$) and degree of ambivalence (RIAS; $r = .412$, $p < .0001$). In terms of their relationship with suicide ideation, both of these measures which yielded identical Pearson correlation coefficients were the strongest individual predictors of suicide ideation in the sample in Study 1.

The relative utility of the indicators in the model as predictors of suicide was further explored using multivariate regression analysis (See Table 6). As hopelessness has been demonstrated in the literature to be the single best predictor of suicide ideation (Stephenson et al., 2006; Beck et al., 1990), this variable was entered into the equation in the first step. The multiple correlation differed significantly from zero, $F(1, 395) = 80.67$, $p < .001$, indicating that hopelessness was a significant predictor of suicide ideation for the sample in Study 1. The resulting R^2 indicated that hopelessness accounted for 17% of the variance in the participant's suicide ideation score.

All other variables from the proposed model that were significantly correlated with suicide ideation were entered into the second step of the regression analysis. Adding these indicators significantly increased $R^2 = .272$, $F(10, 386) = 14.44$, $p < .001$. However, not all of the indicators contributed to this significant increase in prediction. Those indicators that added significantly to the regression equation were ambivalence (RIAS; $\beta = .212$, $t = 3.49$, $p < .01$), ruminative response style (RSQ; $\beta = .194$, $t = 3.51$, $p < .001$), and negative affect (NA; $\beta = .131$, $t = 2.04$, $p < .05$). Considered together, this group of predictors accounted for 27% of the variance in the suicide ideation scores.

Discussion

Model Testing

The primary goal of Study 1 was to assess the integrity of the proposed Cognitive-Affective Model of Suicidal Thinking. The confirmatory fit index assessing the fit between the model and the

Table 6:
Multiple Regression Statistics for Predicting Suicide Ideation (BSS scores) in the Full Sample

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance		Significance
		B	Std. Error	Beta			R^2	R^2 Change
1	(Constant)	-.323	.207		-1.557	.120	.170	.170
	BHS Total	.396	.044	.412	8.982	.000		
2	(Constant)	-.007	1.504		-.004	.997	.272	.103
	BHS Total	.153	.062	.159	2.475	.014		
	RIAS Total	.089	.026	.212	3.485	.001		
	GAS-F	-.283	.153	-.118	-1.852	.065		
	Possaff	-.044	.025	-.099	-1.751	.081		
	NA	.057	.028	.131	2.041	.042		
	GAS-S	.154	.139	.071	1.107	.269		
	RSQ Total	.048	.014	.194	3.514	.000		
	PSWQ	-.013	.013	-.058	-1.048	.295		
	Anger (self)	-.290	.153	-.114	-1.895	.059		
	SPSI-A	-.036	.041	-.045	-.890	.374		

NOTE: N = 397
BSS total = Beck Scale for Suicide Ideation; BHS = Beck Hopelessness Scale; RIAS = Raulin's Intense Ambivalence Scale; GAS–Future = General Attitudes Scale-Future Orientation; PA = Positive and Negative Affect Scale-Positive affect; NA = Positive and Negative Affect Scale-Negative affect; GAS-S = General Attitudes Scale-Self Orientation; RSQ Total = Response Style Questionnaire Total; PSWQ-Total = Penn-State Worry Questionnaire-Total score; SPSI-A = Social Problem-Solving Inventory-Avoidant style.

data fell close to an acceptable range. The model accounted for 90% of the variance in the data set and was associated with an acceptable margin of residual error. As predicted, affect and rumination shared a reciprocal relationship with cognitive distortions as well as with cognitive deficits. Further, as was hypothesized, cognitive distortions which had a direct impact on suicide ideation, had a much stronger impact on suicide ideation than did cognitive deficits. However, cognitive deficits did have an indirect effect on suicide ideation through its impact on cognitive distortions.

This pattern was also evident in the more simplified model. With affect and rumination omitted from the model, cognitive distortions had a significant and direct effect on suicide ideation. Similar to the full model, cognitive deficits demonstrated a significant reciprocal relationship with cognitive distortions, but did not have a significant direct effect on suicide ideation. Rather, cognitive deficits demonstrated an indirect effect on suicide ideation through its impact on cognitive distortions. Considered together, these results provide support for the hypothesized model in the current study. Specifically, the results of the current thesis indicate that a combination of negative affect and rumination impacts both cognitive distortions and cognitive deficits. Further, cognitive deficits directly impact cognitive distortions which, in turn, directly impact suicide ideation.

One notable concern with the tested model was the low inter-correlations between the indicators of *Cognitive Deficits* in the tested model. In particular the measure of cognitive rigidity used in the current study (EFT) did not correlate well with the measures of problem-solving or with suicide ideation. Consequently there was a degree of misspecification in the measurement model.

Previous research has demonstrated that the EFT is a valid and reliable measure of cognitive rigidity, which correlates well with measures of hopelessness and suicide ideation (Litinsky & Haslam, 1999). However, these patterns were not found in Study 1. The measure of cognitive rigidity did not demonstrate a significant relationship with either hopelessness or suicide

ideation. As was discussed in the introduction, cognitive rigidity was not expected to have a strong relationship with suicide ideation. Instead, it was predicted that cognitive rigidity would increase further along the suicide continuum as positive affect and associated positive appraisals decreased, and the individual's affective and cognitive state became increasingly negative. In support of this prediction, it is notable that cognitive rigidity demonstrated a significant negative correlation with positive affect, this being its only significant correlation. This significant relationship indicated that, as positive affect decreases, cognitive rigidity becomes more problematic. Consistent with predictions, it is also noteworthy that the ideators in Study 1 reported moderate levels of positive affect. Consequently, the non-significant relationship between cognitive rigidity and suicide ideation may not necessarily be problematic, but rather consistent with the cognitive-affective state that is predicted to be characteristic of suicide ideators.

The fit of a more parsimonious model, in which affect and rumination were omitted, was also assessed in Study 1. The fit indices of this more parsimonious model were indicative of an almost perfect fit between the hypothesized model and the data set. While it is not possible to directly assess the relative fit of the full model and the simplified model, an inspection of the fit indices does seem to indicate that the simpler model is a better fitting model that accounts for a greater proportion of the variance/covariance in the data set. As was previously mentioned, the RMSEA is often used to compare the relative fit of non-nested models. The RMSEA values were .09 and .05 for the full model, and the simplified model, respectively. These resulting values indicate that the simpler model is associated with less residual error than the full model, and would seem to suggest that the inclusion of affect and rumination decreases the overall fit of the hypothesized model.

Affect and rumination were considered to be important processes to integrate into the model for a number of reasons. As was outlined in the introduction, both affect and rumination

have been found to have significant relationships, not only with cognitive deficits and distortions, but also with suicide ideation. Further, extant models of suicide can be criticized for their overly simplistic design and omission of important process variables. Consequently, in the proposed model affect and rumination were hypothesized to contribute to the development of cognitive distortions and cognitive deficits and indirectly to the development of suicide ideation as well.

Although the fit indices support the simpler model excluding affect and rumination, there were a number of findings in Study 1 that support the importance of affect and rumination in understanding the development of suicide ideation. First, *Affect* yielded highly significant correlations with the indicators of *Cognitive Distortions* and with suicide ideation. These patterns were also evident for the indicators of *Rumination.* Further, both *Affect* and *Rumination* demonstrated a direct significant effect on both *Cognitive Deficits* and *Cognitive Distortions* in the tested model. Considered together, these findings support the importance of including both affect and rumination in a model of suicide ideation.

An additional issue is also relevant to the current discussion. It should be noted that SEM assesses the fit of specified model, not only in terms of the indicators of the latent variables and the regression weights of each of these factors in the prediction of dependent variable, but also in terms of the many interrelationships between the latent and observed variables in the model. As such, high correlations between indicators of different latent factors may cause problems in terms of the overall fit of the model. In the proposed model, the relationship between hopelessness and the *Affect* indicators seem to be problematic in this sense.

Hopelessness was selected as an indicator of cognitive distortions in the current study because of its strong demonstrated relationship with other measures of cognitive appraisals, as well as with suicide ideation. However, this choice may have been somewhat problematic. Researchers have reported that the BHS has a two factor structure, which includes both a

cognitive and an affective component (Beck, & Steer, 1988). Consequently, the BHS does not constitute a pure measure of cognition per se. In terms of the proposed model, the choice of the BHS may have been problematic as the *Affect* factor, particularly NA, may have been redundant as an indicator in the model. In Study 1, the BHS was just as significantly correlated with the measures of positive and negative affect, as with the other indicators of cognitive distortions (see Table 5). It is possible that these significant relationships between the BHS and the measures of affect may have impacted the resulting fit indices. Specifically, the fit indices would be higher for the model where affect was omitted, because this information is already included in the model in the BHS score. These noted difficulties have important implications for future research. Subsequent studies testing the proposed model should be conducted with more "pure" measures of cognitive distortions, so that the unique contribution of affect can be more accurately assessed.

Regarding SEM, there is at times a trade off between the statistical strength of the model on the one hand and the conceptual strength of the model on the other hand (Gardner, 2007). The smaller *Cognitive Distortions* and *Cognitive Deficits* model is statistically stronger than the full model that also includes *Affect* and *Rumination*. The full model is conceptually stronger though. In addition to indicating that *Cognitive Distortions* have a stronger impact than *Cognitive Deficits* on suicide ideation, the full model also suggests that *Negative Affect* and *Rumination* have a direct impact on *Cognitive Distortions* and *Cognitive Deficits*, thereby providing useful information about some of the processes that impact cognitive distortions and cognitive deficits.

Differences between Non-ideators and Ideators

A secondary goal of Study 1 involved investigating whether the indicators in the proposed model differed appreciably between ideators and non-ideators. Consistent with the hypotheses, the mean scores were significantly different between ideators and non-ideators on all measures of affect, rumination, and cognitive distortions in the small sub sample of 32 ideators and 32 randomly

selected non-ideators. Compared to non-ideators, ideators endorsed significantly higher levels of hopelessness, and less positive cognitive appraisals of themselves and their future. Further, ideators reported significantly lower levels of positive affect, and significantly higher levels of negative affect and self-directed anger than non-ideators in the sample. As was also predicted, ideators endorsed significantly higher levels of rumination than non-ideators and this pattern was found for all measures of rumination.

In the general introduction, it was recognized that research assessing the relationship between cognitive deficits and suicidal thinking and behavior is somewhat limited, and that findings have been mixed. In particular, it was noted that findings assessing the relationship between problem-solving deficits and suicide have been inconsistent. Some researchers have reported that suicide ideators have greater deficits in problem-solving than non-ideators (Schotte & Clum, 1987), whereas other researchers have reported that problem-solving deficits do not differ appreciably between suicide ideators and non-ideators (Yang & Clum, 1995). The results of the Study 1 are consistent with the findings of Yang and Clum (1995), as ideators did not differ significantly from non-ideators in terms of self-reported problem-solving in the current study. Further, non-ideators and ideators did not differ significantly in terms of cognitive rigidity.

The results of Study 1 did support one significant difference in terms of cognitive deficits. Ideators did report a significantly higher rate of self-reported problem-solving avoidance than the non-ideators. Considered together, these findings indicated that ideators believed that they were effective problem solvers, but reported a tendency to avoid addressing problems rather than taking an active problem-solving approach.

In summary, the findings in Study 1 indicate that there are significant differences among non-ideators and ideators. Compared to non-ideators, ideators endorsed significantly higher levels of: negative affect, self-directed anger, rumination, hopelessness, negative appraisals of self and

future, and problem-solving avoidance, while endorsing, significantly lower levels of positive affect. These significant differences provide strong support for the hypothesis that ideators differ appreciably form non-ideators in terms of affect, rumination, and cognitive distortions. However, as was predicted, the findings in Study 1 provide less support for the idea that ideators differ significantly from non-ideators in terms of cognitive deficits. The proposed differences between ideators and non-ideators are further explored in Study 2.

Predicting Suicide Ideation

The final goal of Study 1 involved assessing the relative utility of affect, rumination, cognitive deficits, and cognitive distortions in the prediction of suicide ideation. When considering the bivariate correlation analysis, two predictors (hopelessness and ambivalence) were the best single predictors of suicide ideation. Interestingly, both of these indicators yielded identical significant positive correlations with suicide ideation. Researchers have typically identified hopelessness as the best single predictor of suicide ideation (Stephenson, Pena-Shaff, & Quirk, 2006; Beck, Steer, Kovacs, & Garrison, 1985). As was previously discussed, the BHS has a two factor structure, which includes both negative affect and negative appraisals. As such, the fact that hopelessness is highly predictive of suicide ideation indicates that a combination of negative affect and negative appraisals regarding the future has utility for predicting suicide ideation.

However, ambivalence was equally as predictive of suicide ideation as hopelessness in the current sample. This finding has some interesting implications. It has been typically assumed that suicide ideation is best predicted by hopelessness, which is characterized by a negative cognitive-affective state. Ambivalence, on the other hand, embodies not only a negative cognitive-affective state, but also simultaneously embodies a positive cognitive-affective state. The finding that ambivalence is as strong a predictor of suicide ideation as hopelessness in the current sample provides support for the more comprehensive cognitive-affective model of suicide that was outlined

in the introduction. Specifically, this finding provides support for the hypothesis that suicide ideation is characterized not only by negative affect and related negative appraisals, but also by positive affect and positive cognitive appraisals.

The relative utility of the predictors in the model were further assessed using a multiple regression analysis in Study 1. Consistent with previous research (e.g., Stephenson, Pena-Shaff, & Quirk, 2006; Beck, Steer & McElroy, 1982) hopelessness was found to be a significant predictor of suicide ideation. The prediction of suicide ideation was further enhanced by including the measures of ambivalence, ruminative response style, and negative affect. Interestingly, this composite of scores includes a measure of cognitive distortions, a measure of affect, and a measure of rumination, in addition to ambivalence. These findings have important implications, as they not only enhance our current understanding of the prediction of suicide ideation, but also support the importance of cognitive distortions, affect, and rumination in the prediction of suicide ideation, thereby providing additional validation for the components of the proposed model.

In summary, the results of Study 1 provide some support for the proposed Cognitive-Affective Model of Suicide Ideation and provide new information regarding the prediction of suicidal thinking. One clear limitation of Study 1 was the fact that it was conducted with a sample of undergraduate students. While this choice of sample was necessary given the constraints of the current study, the relationships in the model need to be further examined in community and/or clinical samples. Further, the sample in Study 1 was comprised of ideators and non-ideators. Consequently, the proposed relationships in the model also need to be assessed not only in non-ideators and ideators, but in a group of suicide attempters as well. Study 2 was designed to address this goal.

CHAPTER 5: STUDY 2

Overview and Predictions

Having assessed the integrity of the proposed model in relationship to suicide ideation in the first study, the next logical step was to assess whether the proposed changes in the model were evident across the continuum from non-ideators to ideators, and from ideators to attempters. Ideally, to assess the entirety of the proposed model, researchers could conduct a longitudinal study, where individuals who are identified as being at risk of suicidal thinking and behavior would be followed over long periods of time to determine whether the changes that are proposed in the model do in fact change consistently over time across the suicide continuum. Given the time constraints of the current dissertation, it was not possible to undertake a longitudinal study. As such, the second study was designed to investigate a cross section of the suicidal continuum at one point in time.

Ultimately, the integrity of the proposed model will need to be assessed in a large community sample comprised of non-ideators, ideators, and attempters. As was discussed in Study 1, a very large sample (in excess of 350 participants) is required to use SEM to assess the fit of the proposed model given the number of indicators and variables to be estimated. Practical constraints of the current dissertation did not permit this undertaking. However, in Study 2 a community/clinical sample was recruited to examine whether the variables in the model- including, affect, rumination, cognitive deficits and cognitive distortions- changed as predicted between non-ideators, and ideators, and also between ideators and recent suicide attempters.

It has been established throughout the introduction that, in the current model, suicidal thinking and behavior may be conceptualized as a continuum. Given this assumption, a number of patterns were expected to emerge in the data. First, it was predicted that the severity of cognitive deficits and distortions would increase with increasing risk of suicidal behavior. That is, ideators

were expected to have more distortions than non-ideators, attempters more distortions than ideators, and completers more distortions than non-fatal attempters.

Making specific predictions regarding changes in cognitive deficits across the suicide continuum is somewhat more challenging, as research is limited and extant findings are mixed. Although some researchers (e.g., Reinecke, 2006; Heisel et al., 2002; Schotte & Clum, 1987) have suggested that a decision to attempt suicide is preceded by problem-solving deficits, research findings in this area have been varied and inconclusive (Yang & Clum, 1995; Schotte & Clum, 1987). As was outlined in Study 1, it is possible that problem-solving deficits become more pronounced as affect and cognitions become skewed in a negative direction.

As previously discussed, it is also expected that cognitive rigidity would be most problematic when affect and cognitive appraisals are the most negative and distorted. Given that ideators were expected to demonstrate both positive and negative affect and only moderate distortions, it was predicted that cognitive rigidity would remain fairly constant across the first part of the continuum. However, with the development of suicide ideation, and increasing levels of negative affect and negative appraisals (and decreasing levels of positive affect and positive appraisals), cognitive rigidity was expected to increase further along the continuum between ideators and attempters. Similarly, problem-solving avoidance was expected to increase as negative affect and hopelessness increase.

Cognitive deficits were also expected to increase along the suicide continuum, but differences were hypothesized to be greater between the ideators and attempters, than between non-ideators and ideators. As such, it was expected that suicide ideators would have minimal cognitive deficits, whereas suicide attempters would exhibit both cognitive deficits and distortions. Following this line of reasoning then, suicide completers were expected to exhibit both cognitive deficits and distortions, but in a more extreme form than non-fatal suicide attempters. Essentially,

in the present study, cognitive deficits and distortions were expected to demonstrate utility in differentiating between the various levels of suicidal thinking and behavior.

Considering the findings that have been reviewed throughout the general introduction, a number of predictions were made regarding the expected patterns of affect in the different groups. Recall that researchers have found a consistent relationship between cognitive appraisals and affect. Negative appraisals tend to be associated with negative affect (Watson & Clark, 1984), whereas positive appraisals tend to be associated with positive affect (Forgas, 2001). Given this trend, an increase in cognitive distortions was expected to occur concomitantly with increases in negative affect across the suicide continuum. It was also expected that as cognitive deficits develop, and cognitive distortions become more severe, positive appraisals and positive affect would also decrease across the suicide continuum.

Another variable expected to change along the continuum of suicide was degree of ambivalence. Non-ideating controls, those with an absence of cognitive distortions or deficits and the presence of high positive affect and low negative affect, were expected to evaluate life in a positive manner and death in a negative manner with a high degree of certainty and little ambivalence. As individuals move along the suicide continuum, from non-ideation to ideation, negative affect and negative thinking were expected to increase and positive affect and positive thinking were expected to decrease. At this point, the individual should demonstrate high levels of negative affect, but also report moderate levels of positive affect. With this shift in cognition and affect, less clarity and a greater sense of ambivalence regarding life and death was also expected. As progression along the suicide continuum continues, and thinking and affect become primarily negative, there is an associated absence of positive thinking and positive affect. Consequently, in the suicide attempter group, life is appraised negatively, death is appraised positively, certainty is

high, and ambivalence is lower. In the present study, ambivalence was assessed in the various samples to determine if this trend was supported by the data.

A secondary goal of Study 2 involved assessing the relative utility of the indicators in the model in the prediction of suicide ideation and suicide attempts. Consistent with the hypotheses, and the findings in Study 1, it was predicted that cognitive deficits, cognitive distortions, affect, and rumination would have utility for predicting suicide ideation. As such, Study 2 was designed to replicate the findings of Study 1 in a community sample. Further, Study 2 was designed to extend the findings of Study 1 by assessing the utility of these factors, not only as predictors of ideation, but also as predictors of the severity of intent in suicide attempters.

Method

Participants

Participants for the non-ideating group and the suicide ideating group were recruited through advertisements in the local newspaper (see Appendix H). A sample of recent suicide attempters was recruited through primary care clinicians in local psychiatric hospitals. The notice that was circulated to primary care clinicians for participant recruitment is presented in Appendix I.

Although suicidal thinking and behavior are known to affect all age groups, one exclusionary criterion was that samples would be between the ages of 18 and 65. This age range was selected because there are some clear developmental differences for individuals younger than eighteen years of age or older than 65 (Coria, Gomez de Caso, Minguez, Rodriguez-Artalejo & Claveria, 1993); Brayne, Paykel, Huppert, & O'Connor, 1995; De Ronchi, Berandi, Menchetti, Ferrari, Serretti, Dalmonte et al., 2005).

Beyond these age restrictions, specific inclusion criteria were established for each group in Study 2. Individuals who had never met the diagnostic criteria for a mental disorder, and were not currently experiencing suicide ideation were included in the control group. Individuals who were

currently experiencing suicide ideation were included in the ideation group, and only those individuals who had attempted suicide within the past thirty days were included in the suicide attempter group. Further, all participants in the recent suicide attempter group, and 11 participants (44%) in the ideator group, reported previous suicide attempts. It is also notable that the most recent suicide attempt among these prior attempts occurred two years prior to participation in the current study. As noted in the general introduction, suicidal thinking and behavior is associated with a wide range of psychological disorders. With the goal of recruiting a diverse sample that is representative of the heterogeneous pathology associated with suicidal thinking and behavior, there were no specific exclusionary diagnostic criteria for individuals in the ideator and attempter groups.

Initially, it was proposed that 300 individuals would be recruited to participate in Study 2. However, recruitment proved to be slower and much more difficult than had been initially expected, particularly for the recent suicide attempter group. Over a two and half year period, a total of 93 participants volunteered to participate in Study 2. Of these 93 individuals, 25 met the inclusion criteria for the control group, 25 met the criteria for the ideator group, and 11 individuals met the criteria of the attempter group.

When recruiting participants for Study 2, every attempt was made to match participants across all three groups as closely as possible on characteristics, such as age, gender, education and current psychiatric diagnosis, to control the potentially confounding effects of these variables. Given that the attempter sample is smaller than the control or ideator groups, the percentage of the sample with these characteristics differs between groups, but the specific number of participants with specific characteristics is similar for each of the groups. The demographic information for the three groups is presented in Table 7.

Table 7:
Study 2: Demographic Characteristics of the Sample of Non-Ideators, Ideators, and Attempters

		NON-IDEATORS		IDEATORS		ATTEMPTERS	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Sex	Male	8	32.0	6	24.0	4	36.4
	Female	17	68.0	19	76.0	7	63.6
Age	Under 21	6	24.0	5	28.0	2	18.2
	21-25	9	36.0	6	24.0	1	9.1
	26-30	3	12.0	3	12.0	0	0.0
	31-35	1	4.0	4	16.0	1	9.1
	36-40	1	4.0	2	8.0	0	0.0
	41-45	1	4.0	3	12.0	5	45.5
	46-50	2	8.0	0	0.0	0	0.0
	51-55	1	4.0	0	0.0	2	18.2
	56-60	1	4.0	0	0.0	0	0.0
	61-65	0	0.0	0	0.0	0	0.0
Marital Status	Single	17	68.0	17	68.0	6	54.5
	Married	2	8.0	3	12.0	3	27.3
	Common-law	2	8.0	3	12.0	0	0.0
	Separated	1	4.0	1	4.0	1	9.1
	Divorced	2	8.0	1	4.0	1	9.1
	Widowed	1	4.0	0	0.0	0	0.0
Children	No	15	60.0	17	68.0	5	45.5
	Yes	10	40.0	8	32.0	6	54.6
Education Level Completed	Some High School	2	8.0	0	0.0	2	18.2
	High School	23	92.0	25	100.0	8	72.8
	College	7	28.0	6	24.0	1	9.1
	Some Undergrad	16	64.0	17	68.0	7	63.6
	Undergrad	2	8.0	2	8.0	2	18.2
	Graduate	0	0.0	0	0.0	1	9.1
Employment	None	3	12.0	2	8.0	5	45.5
	Part-Time	17	68.0	21	84.0	4	36.4
	Full-Time	5	20.0	2	8.0	2	18.2
Suicide Ideation/ Behavior	Non-Ideation	0	0.0	0	0.0	0	0.0
	Current Ideation	0	0.0	25	100.0	11	100.0
	Recent Attempts	0	0.0	0	0.0	11	100.0
	Prior attempt	0	0.0	11	44.0	11	100.0
Total participants per sample:		25		25		11	
Mean Age per Sample:		28.64		27.24		38.36	
Standard Deviation (Age):		11.84		8.50		12.20	

Note: Recent attempt = a non-fatal suicide attempt within the past 30 days; Prior attempt = historical suicide attempt

The age of the participants ranged from 18 to 63, with a mean age of 29 (S.D. = 11.84), 27 (S.D. = 8.50), and 38 (S.D. = 12.20), for the control, ideator, and attempter groups, respectively. The gender ratio for the three groups was similar with 32%, 24%, and 36% of the samples being male, for the control, ideator, and attempter groups, respectively. The manner in which the groups differed most appreciably was in terms of employment. Whereas 12% of the control group and 8% of the ideator group were unemployed, 46% of the participants in the attempter group were not gainfully employed at the time that they volunteered for Study 2. This high level of unemployment in the attempter group is perhaps not surprising, given the high level of comorbid diagnoses that were characteristic of this group. That is, such high levels of symptomatology would likely be associated with high levels of distress, and social and occupational dysfunction, making it difficult to maintain gainful employment.

A summary of the diagnostic characteristics of the three groups is presented in Table 8. All diagnoses were based on the Structured Clinical Interview for the DSM-IV (SCID-I; First, Spitzer, Gibbon, & Williams, 1997). As the absence of any pathology was one of the inclusion criteria for the non-ideating control group, none of the participants in this group met the diagnostic criterion for a current (or past) psychological disorder. For the ideator group, 20% of the sample met the criterion for one disorder, 56% met the criterion for multiple concurrent diagnoses, and 24% of the sample did not meet the criterion for any disorder. All participants in the attempter group met the diagnostic criteria for at least two concurrent disorders, and 76% of the attempter group met criteria for three or more comorbid diagnoses. The most common diagnosis in both the ideator and attempter groups was major depressive episode (recurrent). Within the attempter group, both post traumatic stress disorder and social phobia were also common diagnoses, with 46% of the attempters meeting the diagnostic criterion for each of these disorders.

Table 8:
Study 2: Diagnostic Characteristics for the Non-Ideators, Ideators and Attempters

	NON-IDEATORS		IDEATORS		ATTEMPTERS	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Generalized Anxiety Disorder	0	0.0	4	16.0	3	27.3
Obsessive Compulsive Disorder	0	0.0	3	12.0	3	27.3
Panic Disorder (w/o/A)	0	0.0	2	8.0	3	27.3
Panic Disorder (w/A)	0	0.0	2	8.0	3	27.3
Post Traumatic Stress Disorder	0	0.0	2	8.0	5	45.5
Specific Phobia	0	0.0	1	4.0	1	9.1
Social Phobia	0	0.0	2	8.0	5	45.5
Bipolar Disorder-Type I	0	0.0	3	12.0	2	18.2
Bipolar Disorder-Type II	0	0.0	0	0.0	2	18.2
Cyclothymia	0	0.0	0	0.0	0	0.0
Dysthymia	0	0.0	2	8.0	0	0.0
Major Depressive Episode (S)	0	0.0	2	8.0	0	0.0
Major Depressive Episode (R)	0	0.0	10	40.0	7	63.6
Major Depressive Episode (w/p)	0	0.0	0	0.0	0	0.0
Delusional Disorder	0	0.0	0	0.0	0	0.0
Psychotic disorder (NOS)	0	0.0	0	0.0	0	0.0
Schizoaffective disorder	0	0.0	1	4.0	1	9.1
Schizophrenia (NOS)	0	0.0	0	0.0	0	0.0
Schizophrenia (P. Type)	0	0.0	1	4.0	0	0.0
Alcohol abuse	0	0.0	1	4.0	0	0.0
Alcohol dependence	0	0.0	1	4.0	1	9.1
Substance abuse	0	0.0	0	0.0	1	9.1
Substance dependence	0	0.0	0	0.0	0	0.0
Bulimia	0	0.0	1	4.0	0	0.0
Total with no Disorder	25		6	24.0	0	0.0
Total with one Disorder	0		5	20.0	0	0.0
Total with multiple Comorbid Disorders	0		14	56.0	11	100.0
Total participants per sample:	25	100.0	25	100.0	11	100.0

Note: Panic disorder (w/o/A) = without Agoraphobia; Panic disorder (w/A) = with Agoraphobia; Major Depressive Episode (w/p) = Major Depressive Episode with psychotic features; Major Depressive Episode (S) = Major Depressive episode -single episode; Major Depressive Episode (R) Major Depressive Episode (recurrent episodes) NOS = Not otherwise specified; Schizophrenia (P. Type) = Schizophrenia - Paranoid type.

Measures

Diagnosis of Psychological Disorder(s)

As was discussed in the introduction, it is important to determine the specific diagnostic characteristics of the sample in suicidology research. Consequently, to determine the specific diagnostic characteristics of the sample in the current study, a Structured Clinical interview for the Diagnostic and Statistical Manual of Mental Disorders (SCID-I: First et al., 1997) for Axis I disorders was administered for each participant.[4] The SCID-I has demonstrated adequate reliability for the categorical constructs (i.e., the DSM-IV diagnoses being assessed), with estimates of reliability ranging from .75 to .90 (Ventura et al., 1998; Zanarini & Frankenburg, 2001).

Level of Intent of Suicide Attempts

A suicide attempt score was calculated for each participant based on the occurrence of a recent suicide attempt, combined with the endorsed level of intent associated with the recent suicide attempt (from item 21 on the Beck Scale for Suicide Ideation). The resulting suicide attempt scores ranged from 0 (no recent attempt) to 4 (recent attempt with a high level of intent).

Other Measures

All other measures used in Study 2 were the same as those that were used in Study 1. As a description and the psychometric properties of each measure were discussed in the *Measures* section in Study 1, they are summarized in Table 9 and will not be described again in detail here.

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4. It should be noted that the researcher who conducted the SCID-I interviews in Study 2 has extensive training in SCID-I diagnostic interviewing. In previous studies (e.g., Dozois, 2007), the interviewer has demonstrated excellent inter-rater diagnostic reliability (95% agreement on individual diagnoses; kappa=.84), relative to three other doctoral level diagnosticians. Further, when blind to diagnosis, the current researcher demonstrated perfect inter-rater reliability (kappa=1.0) for assessing the absence or presence of a diagnosis of depression, as well as perfect inter-rater reliability (kappa=1.0) when assessing whether previously depressed individuals continued to meet the diagnostic criteria. In a previous study, when blind to the diagnosis made by other diagnosticians, the current researcher demonstrated excellent inter-rater reliability (kappa=.87) for diagnosis of mood and/or anxiety disorders (Dozois & Frewen, 2006).

Table 9:
Summary of Measures for Study 2

	INDICATOR	MEASURE		CRONBACH'S ALPHA (Study 2)
Suicide Ideation	Suicide ideation	Beck Scale for Suicide Ideation	BSS (1)	.96
Cognitive Distortions	Hopelessness	Beck Hopelessness Scale	BHS (2)	.95
	Cognitive Appraisal (Self)	General Attitude Scale-Self	GAS-S (3)	-
	Cognitive Appraisal (Future)	General Attitude Scale-Future	GAS-F (4)	-
Cognitive Deficits	Cognitive rigidity	Embedded Figures Test	EFT (5)	-
	Problem solving abilities	SPSI-Rational Problem-solving	SPSI-R (6)	.75
	Problem solving avoidance	SPSI-Avoidant problem-solving	SPSI-A (7)	.85
Affect	Positive Affect	PANAS (positive affect scale)	PA (8)	.94
	Negative Affect	PANAS (negative affect scale)	NA (9)	.91
	Anger (Self-directed)	PANAS (additional item)		
Rumination	Ruminative tendency	Global Rumination Scale	GRS (10)	.69
	Worry tendency	Penn-State Worry Questionnaire	PSWQ (11)	.94
	Ruminative response style	Response Style Questionnaire	RSQ (12)	.94
Ambivalence	Attitudinal ambivalence	Raulin's Intense ambivalence Scale	RIAS (13)	.93

Note: SPSI = Social Problem-solving Inventory; (1; BSS; ; Beck, & Steer, 1993); (2; Beck, Rial, & Rickels, 1974); (3; Fazakas-DeHoog, 2007); (4; Fazakas-DeHoog, 2007); (5; Oltman, Witkin, Raskin, & Karp, 1971) (6; D'Zurilla, Nezu, & Maydeu Olivares,1998); (7; D'Zurilla et al.,1998); (8; Watson, Clark & Tellegen, 1988); (9; Watson et al., 1988); (10; McIntosh et al., 1995); (11; Meyer et al., 1990); (12; Nolen-Hoeksema & Morrow, 1991); (13; Raulin, 1984).

Procedure

Participants were briefed about the study and were asked to provide an informed consent. The information sheet and informed consent are presented in Appendix J and Appendix K, respectively. All of the individuals who volunteered to take part in Study 2, then participated in a Structured Clinical Interview for the DSM-IV (SCID-I). Following the diagnostic interview, participants were asked to complete a series of self-report paper and pencil questionnaires. After the completion of these measures, participants completed the timed cognitive rigidity task (EFT) that was administered by the researcher. Following the completion of all measures, each participant was debriefed and any questions or concerns were addressed. The Feedback sheet is presented in Appendix L. Following the debriefing, each participant was compensated in the amount of $20.00. The Health Sciences REB ethics approval did not permit notifying the potential participants of the financial compensation at the time of recruitment. As such, when they volunteered to participate in the study, participants were unaware that they would be financially compensated for doing so.

Given that many of the participants in Study 2 were either suicide ideators or recent suicide attempters, the potential for imminent suicide risk was also assessed at the time of the debriefing. A special crisis intervention protocol had been developed for Study 2, in the event that any of the participants were distressed following the completion of the study. This protocol included the following: A licensed psychologist was available by telephone during the completion of the study should a crisis arise. All participants who were ideating were also contacted by telephone the day after completing the study. Any participant who communicated distress either immediately following the study, or during the day after the study during the follow-up telephone call were immediately referred to a licensed clinician for immediate assessment and intervention. Further, although most participants were already in the care of mental health practitioners, referrals to

support services in the community were provided. Each participant was also given a list of self-referral community resources. This list is presented in Appendix M. All participants who were ideating were also contacted investigator by telephone the day after the study. This protocol involved referring the participant to a licensed clinician for immediate assessment and Intervention.

Results

Significant Differences along the Suicide Continuum

A primary goal of Study 2 involved further investigating the proposed relationships in the hypothesized model that was assessed in Study 1. To this end, bivariate correlations were calculated for the suicide ideation score and measures of affect, rumination, cognitive deficits, and cognitive distortions. The resulting correlation matrix for the full sample is presented in Table 10.

An inspection of this matrix indicated that all three measures of cognitive distortions yielded very high significant correlations with the suicide ideation score, with hopelessness demonstrating the highest positive correlation with suicide ideation. Two of the cognitive deficits measures, cognitive rigidity and avoidant problem-solving, were both highly and significantly correlated with the suicide ideation score, whereas the rational problem-solving measure was not. Positive affect yielded a significant negative correlation with suicide ideation, whereas both negative affect and self-directed anger demonstrated a highly significant positive correlation with suicide ideation. Further, all measures of rumination and the measure of ambivalence yielded moderate positive significant correlations with suicide ideation. In summary, with the exception of the non-significant correlation between rational problem-solving and suicide ideation, all of the demonstrated findings are consistent with the expected relationships in the proposed model.

A fundamental goal of Study 2 involved investigating the proposed relationships in the model, not only between non-ideators and ideators as was the case in Study 1, but also between ideators and recent suicide attempters. To this end, mean scores were calculated for the measures

Table 10:
Study 2: Correlation Matrix of all Measures in the Hypothesized Model for Non-Ideators, Ideators, and Attempters

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Suicide Attempt	-	.74**	.59**	-.52**	-.57**	.41**	-.13	.37**	-.53**	.53**	.39**	.32*	.28*	.41**	.31*
2. BSS Total		-	.74**	-.66**	-.68**	.41**	-.11	.43**	-.63**	.56**	.41**	.47**	.49**	.58**	.55**
3. BHS			-	-.85**	-.91**	.48**	-.44**	.57**	-.78**	.73**	.56**	.53**	.59**	.59**	.64**
4. GAS-S				-	.90**	-.41**	.38**	-.56**	.83**	-.74**	-.66**	-.64**	-.65**	-.66**	-.61**
5. GAS-F					-	-.41**	.39**	-.56**	.83**	-.73**	-.60**	-.66**	-.57**	-.64**	-.57**
6. EFT-Mean						-	-.15	.42**	-.40**	.44**	.34**	.33**	.36**	.30*	.33**
7. SPSI-R							-	-.42**	.46**	-.24	-.12	-.15	-.08	-.08	-.32*
8. SPSI-A								-	-.58**	.64**	.50**	.60**	.53**	.68**	.61**
9. PANAS-PA									-	-.63**	-.48**	-.65**	-.52**	-.59**	-.56**
10. PANAS-NA										-	.80**	.59**	.71**	.65**	.62**
11. Anger (Self-Directed)											-	.54**	.63**	.65**	.61**
12. GRS-Total												-	.65**	.78**	.53**
13. PSWQ-Total													-	.71**	.61**
14. RSQ-Total														-	.66**
15. RIAS															-

NOTE: * = P<.05; ** = P<.01;
N= 61
Suicide Attempt = Severity of Intent (of suicide attempt); BSS total = Beck Scale for Suicide Ideation; BHS = Beck Hopelessness Scale; GAS-S= General Attitudes Scale-Self Orientation; GAS-F = General Attitudes Scale-Future Orientation; PANAS-PA = Positive and Negative Affect Scale-Positive affect; PANAS-NA = Positive and Negative Affect Scale-Negative affect; EFT -Mean time = Embedded Figures Test-Mean time per correct response; SPSI-R = Social Problem-Solving Inventory- Rational; SPSI-A = Social Problem-Solving Inventory-Avoidant Problem-Solving Orientation; GRS-Total = Global Rumination Scale-Total score; PSWQ-Total = Penn-State Worry Questionnaire- Total score; RSQ-Total = Response Style Questionnaire -Total score; RIAS = Raulin's Intense Ambivalence Scale.

of cognitive distortions, cognitive deficits, affect, and rumination, and a series of family-wise MANOVAs were conducted to determine if scores differed significantly across these three groups. Tukey's post hoc tests were then conducted to determine which group means differed significantly. A family-wise significance value of .05 was selected to control for Type I error, with individual comparisons each tested at .05/n, where n= number of family-wise comparisons. The descriptives for the measures in Study 2 and the significant group differences are presented in Table 11.

Cognitive Distortions

The first MANOVA assessed multivariate and univariate effects for the cognitive distortions measures, which included hopelessness, and positive appraisals of self, future, others, life, and death. A significant multivariate effects was obtained (Pillais =.85, F [12, 108] = 6.69, p<.001) and all univariate (between-subjects) effects were also significant at p<.001. To determine which groups differed significantly, post-hoc between-group differences were assessed using a Tukey's Honestly Significant Difference test. Mean values for all cognitive distortions measures included in the model differed significantly as predicted (and all differences were significant at a level of at least p <.01). That is, positive appraisals of self, and future were significantly lower across the suicide continuum, with ideators endorsing less positive appraisals than non-ideators, and attempters endorsing less positive appraisals than ideators. The reverse was true for hopelessness which increased significantly across three groups. When considered together, these findings support the hypothesis that cognitive distortions progressively increase across groups over the suicide continuum.

Consistent with the previously outlined hypotheses, it was expected that appraisals of life would become more negative and appraisals of death would become more positive along the suicide continuum. To investigate these hypotheses, both of these measures were also included in the MANOVA. The Tukey's post hoc tests indicated that positive appraisals of life were significantly

Table 11: *Study 2: Descriptive Statistics and Post Hoc Comparisons for the Non-Ideator, Ideator, and Attempter Groups*

	Non-Ideators			Ideators			Attempters		
Measure/Indicator	**N**	**Mean**	**S.D.**	**N**	**Mean**	**S.D.**	**N**	**Mean**	**S.D.**
Suicide Ideation									
BSS Total	25	0.44	2.00	25	9.72[a]	5.90	11	24.27[b]	4.34
Cognitive Distortions									
BHS	25	2.32	2.46	25	10.56[a]	6.31	11	17.91[b]	1.22
GAS-S	25	5.32	1.35	25	2.88[a]	1.45	11	1.36[b]	0.51
GAS-F	25	5.68	1.25	25	3.28[a]	1.75	11	1.27[b]	0.65
GAS-L	25	5.96	.84	25	3.56[a]	1.83	11	1.36[b]	.67
GAS-D	25	2.92	1.63	25	3.64	1.15	11	5.73[b]	1.35
GAS-O	25	5.16	1.14	25	3.80[a]	1.40	11	3.64	1.91
Cognitive Deficits									
EFT-Mean Time	25	3.61	1.03	25	5.13	3.14	11	7.06[c]	1.98
SPSI-R	25	11.76	2.82	25	10.20	4.38	11	9.55	4.08
SPSI-A	25	6.04	4.31	25	10.04[a]	4.36	11	13.36[c]	4.30
Affect									
PANAS-Posaff	25	35.92	6.92	25	23.80[a]	8.60	11	15.45[b]	3.14
PANAS-Negaff	25	20.44	6.90	25	30.44[a]	8.10	11	39.45[b]	6.49
Anger (Self-Directed)	25	2.28	1.10	25	3.76[a]	1.30	11	4.45[c]	0.69
Rumination									
GRS-Total	25	33.00	7.63	25	42.20[a]	6.76	11	44.72	7.43
PSWQ-Total	25	46.64	13.95	25	64.20[a]	10.29	11	66.63	9.86
RSQ-total	25	40.52	12.21	25	61.04[a]	9.54	11	67.09	10.89
Ambivalence									
RIAS	25	8.52	8.36	25	21.04[a]	8.41	11	24.64[b]	11.13

NOTE: [a] = *mean ideator score significantly greater than non-ideator score;* [b] = *mean attempter score significantly greater than -ideator score;* : [c] = *mean attempter score significantly greater than non-ideator score; All values based on unequal variances.*

BSS total = Beck Scale for Suicide Ideation; BHS = Beck Hopelessness Scale; GAS-S = General Attitudes Scale-Self ; GAS–F = General Attitudes Scale-Future; GAS–L = General Attitudes Scale-Life; GAS–D = General Attitudes Scale-Death; GAS–O = General Attitudes Scale-Other; EFT-Mean time = Embedded Figures Test-Mean time per correct response; SPSI-R = Social Problem-Solving Inventory- Rational; SPSI-A = Social Problem-Solving Inventory-Avoidant style; SPSI-PPO = Social Problem-Solving Inventory-Positive Problem-Solving Orientation; SPSI-NPO = Social Problem-Solving Inventory-Negative Problem-Solving Orientation; SPSI-I = Social Problem-Solving Inventory-Impulsive style; PANAS-Posaff = Positive and Negative Affect Scale-Positive affect; PANAS-Negaff = Positive and Negative Affect Scale-Negative affect; GRS-Total = Global Rumination Scale-Total score; PSWQ-Total = Penn-State Worry Questionnaire- Total score; RSQ-Total = Response Style Questionnaire total (22-item Ruminative Responses Scale); RIAS = Raulin's Intense Ambivalence Scale.

lower in ideators than non-ideators, and also significantly lower in attempters than ideators. In contrast, positive appraisals of death increased along the entire suicide continuum. While ideators rated death as more positive than non-ideators, this difference was not significant. However, attempters did rate death as significantly more positive than ideators. A graph of the mean positive appraisals of life (GAS-L) and death (GAS-D) scores for each group is presented in Figure 7. As was predicted, these results support the hypothesis that appraisals of life become less positive moving across the suicide continuum, while appraisals of death become more positive.

Cognitive Deficits

A second family-wise MANOVA was conducted to assess between-group and within-group differences for the cognitive deficits measures. Again, a significant multivariate effect was obtained (Pillais =.38, $F[6, 114] = 4.51$, $p<.001$). The between-subjects effects were not significant for rational problem-solving, but were significant for cognitive rigidity (EFT-mean), $F(2, 58) = 9.06$, $p<.001$, and avoidant problem-solving (SPSI-A), $F(2, 58) = 13.16$, $p<.001$. The results of the post hoc tests indicated that mean scores on avoidant problem-solving were significantly higher in ideators than in non-ideators ($p<.01$). Although the mean avoidant problem-solving score was higher in attempters than in ideators, this difference was not significant. Tukey's tests indicated that mean cognitive rigidity scores were not significantly higher in the ideator group than in the non-ideator group, nor were they significantly higher in the attempter group than in the ideator group. However, mean cognitive rigidity scores were significantly higher in the attempter group than the non-ideator group ($p<.001$). While significant incremental increases were not supported between non-ideators and ideators, or between ideators and attempters, these findings suggest that cognitive rigidity increases along the suicide continuum, albeit gradually.

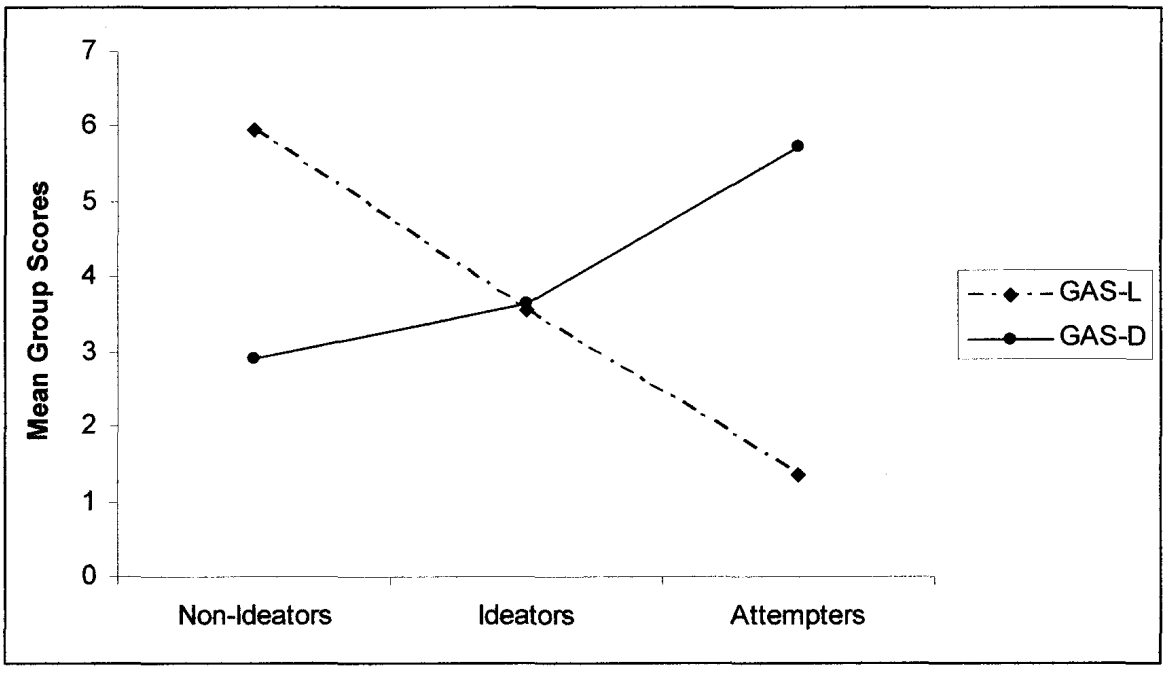

Figure 7:
Study 2: Mean Positive Appraisal of Life (GAS-L) and Mean Appraisal of Death (GAS-D) Scores for Non-Ideator, Ideator and Attempter Groups

Note: GAS-L = General Attitudes Scale-Life appraisal; GAS-D = General Attitudes Scale-Death appraisal;

Affect

The third MANOVA, which assessed affect measures, was significant (Pillais =.69, F [6, 114] = 10.02, p<.001). All univariate (between-subjects) effects were also significant at p<.001. The resultant Tukey's HSD post hoc tests indicated that positive affect decreased along the suicide continuum, with attempters endorsing significantly lower than levels of positive affect than ideators (p< .01), and ideators endorsing significantly lower mean levels of positive affect than non-ideators (p<.001). The opposite findings were noted for negative affect which was found to significantly increase over the suicide continuum. Further, ideators reported significantly higher levels of self-reported anger than non-ideators (p<.001). Although mean self-directed anger was higher in attempters than ideators, post hoc analyses were not significant.

Rumination

The final MANOVA assessing the between-group and within-group differences for the rumination measures yielded significant multivariate effects (Pillais =.55, F [6, 114] = 7.23, p<.001). The univariate (between-subjects) effects were also significant for measures of rumination. Post hoc Tukey's HSD tests indicated that mean scores on global rumination, ruminative worry, and ruminative response style differed significantly between non-ideators and ideators, with all differences significant at p<.001. Mean scores were only marginally higher for all rumination measures between ideators and attempters, and these differences were not significant. These findings suggest that a tendency to ruminate is greater in both ideators and attempters than individuals who are not experiencing suicide ideation. Considered together, this pattern of significant group differences suggests that rumination may have some utility for predicting suicide ideation, or for identifying those individuals who are at risk of suicide ideation or suicide attempts. The current finding also suggests that perhaps the degree of self-reported rumination does not

increase across the later part of the continuum, although longitudinal studies are needed to further assess this possibility.

Ambivalence

An ANOVA was utilized to assess whether ambivalence differed between groups as predicted. The results of the between-groups effects were significant, $F(2,58) = 17.82$, $p < .001$. Further, post hoc tests (Tukey's HSD) identified that ambivalence was significantly higher in both the ideator and attempter groups, when compared to the non-ideator group. Mean ambivalence scores increased marginally between ideators and attempters but these differences were not significant.

Predicting Suicide Ideation

A second goal of Study 2 involved replicating the results of the regression analysis from Study 1 but within a community/clinical sample. In Study 1, regression analyses were used to assess the relative utility of the indicators in the model in the prediction of suicide ideation in a sample comprised solely of non-ideators and ideators. This procedure was replicated in Study 2 using a smaller sub sample of the community group comprised of only the 25 non-ideators and 25 ideators. The relationship between suicide ideation and each of the indicators in the model was calculated using a Pearson correlation analysis. The resulting correlation matrix is presented in Table 12. With the exception of the cognitive deficits measures, all measures in the model demonstrated highly significant correlations with the suicide ideation score. An inspection of the correlations in Table 12, indicated that the three single best predictors of suicide ideation were ruminative response styles (RSQ; $r = .54$, $p < .001$), ambivalence (RIAS; $r = .54$, $p < .001$), and hopelessness (BHS; $r = .54$, $p < .0001$).

To further explore the utility of the indicators in the model as predictors of suicide ideation a multiple regression analysis was subsequently conducted. Similar to the procedure in Study 1,

Table 12:
Study 2: Correlation Matrix of all Measures in the Hypothesized Model for the Non-Ideator and Ideator Groups

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. BSS Total	-	.54**	-.48**	-.49**	.22	.01	.21	-.44**	.38**	.23	.47**	.48**	.55**	.54**
2. BHS		-	-.80**	-.89**	.34*	-.49**	.48**	-.70**	.65**	.45**	.51**	.56**	.52**	.64**
3. GAS-S			-	.86**	-.29*	.42**	-.48**	.78**	-.67**	-.60**	-.61**	-.64**	-.60**	-.62**
4. GAS-F				-	-.27	.43**	-.48**	.77**	-.62**	-.52**	-.63**	-.53**	-.57**	-.59**
5. EFT-Mean					-	-.12	.33*	-.27	.39**	.25	.25	.29*	.20	.26
6. SPSI-R						-	-.37**	.50**	-.21	-.07	-.12	-.11	-.06	-.36*
7. SPSI-A							-	-.53**	.59**	.45**	.54**	.50**	.65**	.60**
8. PANAS-PA								-	-.49**	-.36*	-.64**	-.49**	-.52**	-.56**
9. PANAS-NA									-	.76**	.54**	.76**	.57**	.67**
10. Anger (Self-Directed)										-	.52**	.64**	.60**	.60**
11. GRS-Total											-	.64**	.75**	.61**
12. PSWQ-Total												-	.71**	.64**
13. RSQ-Total													-	.69**
14. RIAS														-

NOTE: * = P<.05; ** = P<.01;
N =50
BSS total = Beck Scale for Suicide Ideation; BHS = Beck Hopelessness Scale; GAS-S= General Attitudes Scale-Self Orientation; GAS-F = General Attitudes Scale-Future Orientation; PANAS-PA = Positive and Negative Affect Scale-Positive affect; PANAS-NA = Positive and Negative Affect Scale-Negative affect; EFT - Mean time = Embedded Figures Test-Mean time per correct response; SPSI-R = Social Problem-Solving Inventory- Rational; SPSI-A = Social Problem-Solving Inventory-Avoidant Problem-Solving Orientation; GRS-Total = Global Rumination Scale-Total score; PSWQ-Total = Penn-State Worry Questionnaire- Total score; RSQ-Total = Response Style Questionnaire -Total score; RIAS = Raulin's Intense Ambivalence Scale.

hopelessness was entered first into the regression equation. The resulting multiple correlation differed significantly from zero, F (1, 48) = 19.31, p< .001, indicating that hopelessness was a significant predictor of suicide ideation for the sample in Study 2 accounting for 29% of the variance in the participants' suicide ideation score. Study 1 within a community sample. In Study 1, regression analyses were used to assess the relative utility of the indicators in the model in the prediction of suicide ideation in a sample comprised solely of non-ideators and ideators. This procedure was replicated in Study 2 using a smaller sub sample of the community group comprised of only the 25 non-ideators and 25 ideators. The relationship between suicide ideation and each of the indicators in the model was calculated using a Pearson correlation analysis. The resulting correlation matrix is presented in Table 12. With the exception of the cognitive deficits measures, all measures in the model demonstrated highly significant correlations with the suicide ideation score. An inspection of the correlations in Table 12, indicated that the three single best predictors of suicide ideation were ruminative response styles (RSQ; r = .54, p< .001), ambivalence (RIAS; r = .54, p< .001), and hopelessness (BHS; r = .54, p< .0001).

To further explore the utility of the indicators in the model as predictors of suicide ideation a multiple regression analysis was subsequently conducted in a sample comprised only of the non-ideators and ideator groups. Similar to the procedure in Study 1, hopelessness was entered first into the regression equation. The resulting multiple correlation differed significantly from zero, F (1, 48) = 19.31, p< .001, indicating that hopelessness was a significant predictor of suicide ideation for the sample in Study 2 accounting for 29% of the variance in the participants' suicide ideation score.

To determine whether any of the other indicators in the model significantly increased the prediction of suicide ideation, all other significant indicators in the model were entered into the second step of the regression analysis. The addition of these indicators significantly increased R^2 = .60, F (12, 36) = 4.19, p< .001. Of the indicators that were entered in the second step, those

variables that added significantly to the regression equation were ambivalence (RIAS; β = .432, *t*= 2.32, *p*< .05), and self-directed anger (β = -.409, t= -2.21 *p*< .05). The addition of these indicators resulted in a Δ R^2 of .315, with this group of predictors accounting for 60% of the variance in the suicide ideation scores.

Predicting the Severity of Intent for Suicide Attempts

As the sample in Study 1 was comprised entirely of ideators and non-ideating controls, it was not possible to assess the relative utility of the indicators in the model in the prediction of suicide attempts. As such, a final goal of Study 2 involved investigating whether this set of indicators also had utility for predicting severity of suicide attempts, in terms of self-reported intent, in a sample of individuals who were currently ideating. A smaller sample, including only the 25 ideators and 11 recent suicide attempters, was utilized for this analysis.

The relationship between the suicide attempt (severity of intent) score and each of the indicators in the model was calculated using a bivariate correlation analysis (Table 13). The resulting correlation matrix indicated that the BSS score demonstrated the strongest linear relationship with level of self-reported intent amongst suicide attempters. However, this high positive correlation would be expected given that the suicide attempt (severity of intent score) was derived, in part, from the participant's response on one of the BSS scale items. Beyond the participant's BSS score, positive appraisals of the future demonstrated the strongest linear relationship with the suicide attempt score (GAS-F; *r* = -.537, *p*< .01), degree of hopelessness (BHS; *r* = .517, *p*< .01), negative affect (NA; *r* = .492, *p*< .01), positive affect, (PA; *r* = -.481, *p*< .01), and positive appraisals of self (GAS-S; *r* = -.481, *p*< .01) also demonstrated significant correlations with the suicide attempt score. Considered together these findings support the hypotheses that as negative affect and hopelessness increase, and positive affect and positive

Table 13:
Study 2: Correlation Matrix of all Measures in the Hypothesized Model for the Ideator and Attempter Groups

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Attempt Intent	-	.74**	.52**	-.48**	-.54**	.31	-.06	.29	-.48**	.49**	.28	.19	.10	.31	.13
2. BSS Total		-	.44**	-.33*	-.39*	.21	.08	.21	-.33*	.30	-.03	.15	.18	.23	.29
3. BHS			-	-.76**	-.88**	.34*	-.49**	.50**	-.67**	.61**	.26	.20	.40**	.19	.46**
4. GAS-S				-	.85**	-.27	.38*	-.44**	.63**	-.59**	-.30	-.37*	-.35*	-.35*	-.34*
5. GAS-F					-	-.28	.36*	-.41*	.77**	-.59**	-.27	-.48**	-.37*	-.29	-.26
6. EFT-Mean						-	-.08	.40*	-.26	.37*	.20	.28	.30	.10	.21
7. SPSI-R							-	-.36*	.39*	-.25	.06	.16	.01	.22	-.25
8. SPSI-A								-	-.31	.55**	.31	.39*	.39*	.49**	.44**
9. PANAS-PA									-	-.39*	-.05	-.37*	-.14	-.16	-.16
10. PANAS-NA										-	.61**	.33*	.40*	.36*	.34*
11. Anger (Self-Directed)											-	.18	.27	.40*	.26
12. GRS-Total												-	.51**	.68**	-.03
13. PSWQ-Total													-	.44**	.27
14. RSQ-Total														-	.29
15. RIAS															-

NOTE: * = $p<.05$; ** = $p<.01$;

Attempt Intent = Suicide Attempt (Severity of Intent) score; BSS total = Beck Scale for Suicide Ideation; BHS = Beck Hopelessness Scale; GAS-S= General Attitudes Scale-Self Orientation; GAS-F = General Attitudes Scale-Future Orientation; PANAS-PA = Positive and Negative Affect Scale-Positive affect; PANAS-NA = Positive and Negative Affect Scale-Negative affect; EFT -Mean time = Embedded Figures Test-Mean time per correct response; SPSI-R = Social Problem-Solving Inventory- Rational; SPSI-A = Social Problem-Solving Inventory-Avoidant Problem-Solving Orientation; GRS-Total = Global Rumination Scale-Total score; PSWQ-Total = Penn-State Worry Questionnaire- Total score; RSQ-Total = Response Style Questionnaire -Total score; RIAS = Raulin's Intense Ambivalence Scale.

evaluations of one's future and oneself decrease, the severity of intent related to suicide attempts also increases.

The relative utility of the indicators in the model as predictors of suicide attempts was further explored using multivariate regression analysis. Hopelessness was entered in the first step of the equation. The resulting multiple correlation differed significantly from zero, $F(1, 34) = 12.42$, $p < .01$, indicating that hopelessness (which accounted for 27% of the variance) was a significant predictor of suicide attempts in the sample of ideators and attempters in Study 2. When the other correlated indicators from the model were entered into the second step of the regression analysis, the resulting multiple correlation did not differ significantly from zero, $F(4, 30) = 3.31$, ns, indicating that adding the additional indicators did not appreciably increase the predictive utility of the regression equation. These findings would suggest that when compared to the other components of the model, hopelessness is the best predictor of intent amongst recent suicide attempters.

Discussion

The Predicted Model

The findings in Study 2 provide further support for the relationships of the proposed model that was assessed in Study 1. The correlation analysis indicated that cognitive distortions yielded the strongest linear relationship with suicide ideation, as would be expected given the demonstrated finding that *Cognitive Distortions* was the only component in the model that was found to directly impact suicide ideation. Of the indicators in the proposed model, the measure of hopelessness demonstrated the strongest bivariate relationship with suicide ideation, and this was true for both studies. As the Beck Hopelessness Scale is comprised of both a cognitive and affective factor, the finding that this measure has the strongest linear relationship with suicide ideation provides further support for the importance of considering both cognitive and affective factors when predicting suicide ideation. As is also consistent with the expected relationships in

the model, in Study 2 measures of affect, rumination, cognitive distortions, and cognitive deficits all demonstrated significant intercorrelations. The only notable exception was rational problem-solving, which did not correlate well with the other indicators in the model. But again, this lack of significant correlations between rational problem-solving and the other indicators in the model is consistent with the findings in Study 1.

The findings from Study 2 are generally consistent with those reported in Study 1. When considered together, the findings indicate that non-ideators, ideators, and attempters tend to differ significantly in a predictable manner; a manner which is consistent with the proposed model and the previously outlined hypotheses. A summary of Study 1 and Study 2 is presented in Table 14.

Differences between Non-Ideators, Ideators, and Attempters

Non-Ideators

In the studies reported herein, non-ideators demonstrated minimal cognitive distortions: they endorsed low levels of hopelessness, and appraised themselves, their future, and life in positive manner. As was also predicted, non-ideators appraised death in a negative manner. In the current studies, the thinking of the non-ideator groups was not characterized by cognitive deficits. Within the non-ideator groups, thinking was flexible and individuals reported that they are able to engage in adaptive problem-solving with a minimal degree of problem-solving avoidance. In terms of affect, the non-ideator groups endorsed low levels of self-directed anger and, while the non-ideator groups did report negative affect, they reported relatively higher levels of positive affect. Further, the non-ideators reported low levels of both rumination and ambivalence.

Ideators

The ideator groups in Studies 1 and 2 reported moderate levels of cognitive distortions, in terms of hopelessness and appraisals of self and future (i.e., the level of cognitive distortions in the ideator group was significantly higher than the non-ideator group, but significantly lower than the

Table 14:
Summary of the Significant Between Group Differences along the Suicide Continuum from Study 1 and Study 2

	Non-Ideators		Ideators		Attempters
Suicide Ideation					
BSS	N-I	<	I	<	A
Cognitive Distortions					
BHS	N-I	<	I	<	A
GAS-S	N-I	>	I	>	A
GAS-F	N-I	>	I	>	A
GAS-L	N-I	>	I	>	A
GAS-D	N-I	< **	I	<	A
GAS-O	N-I	>	I	ns	A
Cognitive Deficits					
EFT-Mean	N-I	ns	I	ns	A*
SPSI-R	N-I	ns	I	ns	A
SPSI-A	N-I	<	I	ns	A
Affect					
PA	N-I	>	I	>	A
NA	N-I	<	I	<	A
Self-Directed Anger	N-I	<	I	ns	A
Rumination					
GRS	N-I	<	I	ns	A
PSWQ	N-I	<	I	ns	A
RSQ	N-I	<	I	ns	A
Ambivalence					
RIAS	N-I	<	I	ns	A

NOTE: * Significant group differences found between non-ideators and attempters in Study 2
** Significant group differences found in Study 1, but not replicated in Study 2.
ns = between-group differences were not significant.
< = less than
> = greater than

N-I = Non-ideator group; I = Ideator group; A = Attempter group; BSS total = Beck Scale for Suicide Ideation; BHS = Beck Hopelessness Scale; GAS-S = General Attitudes Scale-Self Orientation; GAS–F = General Attitudes Scale-Future Orientation; GAS–L = General Attitudes Scale-Life Orientation; GAS–D = General Attitudes Scale-Death Orientation; GAS–O = General Attitudes Scale-Other Orientation; EFT-Mean time = Embedded Figures Test-Mean time per correct response; SPSI-R = Social Problem-Solving Inventory-Rational; SPSI-A = Social Problem-Solving Inventory-Avoidant style; SPSI-PPO = Social Problem-Solving Inventory-Positive Problem-Solving Orientation; SPSI-NPO = Social Problem-Solving Inventory-Negative Problem-Solving Orientation; SPSI-I = Social Problem-Solving Inventory-Impulsive style; PA = Positive and Negative Affect Scale-Positive affect; NA = Positive and Negative Affect Scale-Negative affect; GRS-Total = Global Rumination Scale-Total score; PSWQ-Total = Penn-State Worry Questionnaire- Total score; RSQ-Total = Response Style Questionnaire total (22-item Ruminative Responses Scale); RIAS = Raulin's Intense Ambivalence Scale.

attempter group). In terms of cognitive deficits, ideation was related to moderate levels of cognitive rigidity. Further, ideators endorsed high levels of self-reported problem solving abilities, but also endorsed a generally passive or avoidant approach to problem-solving. One way of interpreting this finding is that, although ideators reported behaviors that are indicative of effective problem-solving, their tendency to rate their abilities (including problem-solving efforts) in negative terms led to a decreased likelihood of engaging in active problem-solving efforts (at least as it was reported by the participants). In general, ideators reported a wide range of affect, with marginally higher levels of negative affect than positive affect. While levels of positive affect are lower than reported negative affect in the ideators, it is notable that there is still a moderate level of self-reported positive affect.

The ideator groups differed significantly from the non-ideator groups in several ways. There were, for example, significant differences between ideators and non-ideators in terms of both positive and negative affect. However, it should be noted that the non-ideating group did report a moderate level of negative affect. More extreme differences between ideators and non-ideators were observed in terms of levels of cognitive distortions and rumination, with the ideator group reporting significantly higher levels on these variables. Considering these group differences, it would seem that negative affect, while necessary, is not sufficient, to explain the differences between ideators and non-ideators. As was previously suggested in the introduction, it is more likely that a negative affect, in combination with rumination, leads to the development of increasingly negative appraisals (Lyubomirsky & Nolen-Hoeksema, 1995). Over time, as the individual ruminates about negative feelings, thinking becomes increasingly negatively distorted, and hopelessness increases, ultimately leading to suicide ideation as well.

But the findings of the current research also support the hypothesis that ideation is characterized by ambivalence. In both Study 1 and Study 2, ideators reported significantly higher

levels of ambivalence than non-ideators. As predicted, positive appraisals of life and death were roughly equivalent in the ideator group. Thus, it is not surprising that ideators would also endorse high levels of ambivalence, given that they simultaneously reported both positive and negative affect, and simultaneously reported both positive and negative appraisals. These observed patterns support the hypotheses in the current studies and provide further support the findings that were reported from Study 1.

Attempters

As predicted the suicide attempter group in Study 2 was characterized by an extremely negative cognitive-affective state. Attempters reported high levels of cognitive distortions including hopelessness, and an absence of positive appraisals of self, future, and life, and positive appraisals of death. Interestingly, attempter's appraisals of others were considerably more positive than their appraisals of self, life or future.

The attempter group demonstrated a higher level of cognitive deficits than either the non-ideator or ideator group. For example, the attempter group demonstrated the highest levels of cognitive rigidity on the timed task, as well as the highest level of problem-solving avoidance. However, suicide attempters endorsed high levels of self-reported problem-solving skills, which did not differ from those reported by the ideator group.

Suicide attempters reported high levels of negative affect, including self-directed anger, and very low levels of positive affect. The attempter group also reported high levels of rumination and ambivalence that were roughly equivalent to those reported by the ideator group. Considered together, these findings suggest that suicide attempters experience a very negative cognitive-affective state, with moderate levels of rumination and ambivalence. While attempters report effective problem-solving skills, they report a general tendency to avoid engaging in active problem solving efforts.

The attempter group differed significantly from the ideator group in a number of important ways. Many of these differences were quantitative in nature. Although both the ideator and attempter groups reported hopelessness and a tendency to appraise self and future in a negative manner, the attempter group showed these tendencies to a more extreme degree. Similarly, ideators reported relatively higher negative affect than positive affect. This trend was the same for attempters, except that the differences were more extreme.

Despite these demonstrated differences, there was one similarity between ideators and attempters that is also worthy of mention. Specifically, both ideators and attempters reported similar levels of rumination. As such, the results of the current studies suggest that rumination may be a constant across the later part of the suicide continuum.

In summary, when considered together, the results of Study 1 and Study 2, suggest that non-ideators, ideators and attempters differ in several predictable ways. One notable difference is the cognitive-affective state that is characteristic of the groups. Non-ideators demonstrate a relatively positive cognitive-affective state and minimal cognitive deficits and distortions. In contrast, ideators exhibit a mixed (both positive and negative) cognitive-affective state with moderate cognitive distortions and minimal cognitive deficits, whereas, attempters displayed a very negative cognitive-affect state, with high levels of cognitive distortions and some evidence of cognitive deficits.

These demonstrated findings have important implications for future suicidology research. As mentioned in the general introduction, there has been a tendency in suicidology research (e.g., Williams, 1986; Schotte & Clum, 1987) for certain researchers to treat ideators and attempters as one homogeneous group. Given the current findings where non-ideators, ideators and attempters were found to differ in a number of predictable ways, there is a clear mandate for researchers to more clearly differentiate between these groups in future suicidology research.

The Suicide Continuum

With very few exceptions, the findings in Study 2 confirmed the proposed changes along the suicide continuum. Moving along the continuum from non-ideators to ideators and from ideators to attempters, positive affect, and positive appraisals of self and future decreased significantly, while negative affect and self-directed anger progressively increased. The predicted pattern was also supported for cognitive distortions, with hopelessness and positive appraisals of death significantly increasing across the continuum.

Related to these changes, ambivalence was also expected to change along the continuum. Moving along the continuum from non-ideation to ideation, ambivalence was expected to increase. This predicted change in ambivalence was consistent with the cognitive-affective characteristics that were predicted for each group. Non-ideators, with low levels of negative affect and negative appraisals, and high levels of positive affect and positive appraisals were expected to have low levels of ambivalence. On the contrary, ideators, with moderate levels of both positive and negative affect, and moderate levels of positive and negative appraisals were expected to endorse higher levels of ambivalence. The results of both Study 1 and Study 2 supported these predictions.

Moving along the suicide continuum from ideators to attempters, it was expected that, as negative affect and negative appraisals increased, with concomitant decreases in positive affect and positive appraisals, ambivalence would decrease. However, the levels of ambivalence did not decrease significantly between ideators and attempters as predicted. Rather, it was noted that ambivalence remained fairly constant along the latter portion of the suicide continuum. Given that affect and cognitive appraisals did change as predicted, it is difficult to explain why the expected changes did not occur in ambivalence in the latter part of the continuum. It is possible that the lack of change in the ambivalence score is the result of sample characteristics. The sample size of the

attempter group was much smaller than the non-ideator or ideator groups. In addition, there were several ambivalence scores that were very high relative to the other attempters in the group, and it is likely that these high scores inflated the mean, given the small sample size. It is also possible that the measure used in the current study was problematic.

One of the three measures of cognitive deficits changed along the continuum, in a manner that was consistent with predictions. While cognitive rigidity did not increase appreciably between non-ideators and ideators, significant increases in cognitive rigidity were found between non-ideators and attempters suggesting that perhaps cognitive rigidity increases along the suicide continuum, albeit gradually. Avoidant problem-solving increased significantly along the continuum form non-ideators to ideators, and incrementally from ideators to attempters, although group contrasts for the latter were not significant. Self-reported problem solving remained relatively constant with no significant increases between groups along the suicide continuum. Consequently, although there was a trend in the data to indicate that cognitive rigidity and self-reported problem-solving avoidance increased along the suicide continuum, cognitive deficits did not increase as significantly between ideators and attempters as predicted. The proposed reason for this finding will be discussed in a subsequent section.

In summary, the results of Study 2 supported the predicted changes along the suicide continuum with few exceptions. Cognitive distortions, affect, and rumination changed as predicted between groups along the continuum. Study 2 also provides some preliminary evidence that cognitive deficits also increase along the suicide continuum, although these changes were not as significant as expected.

Predicting Suicide Ideation

The results of Study 2 further validate the results of Study 1, where it was found that hopelessness was a significant predictor of suicide ideation. As such, the current findings support

the previous research reported by researchers, where hopelessness was found to be a strong predictor of suicide ideation (Stephenson, Pena-Shaff, & Quirk, 2006; Beck et al., 1990). However, the current studies have also demonstrated a new finding: that ambivalence and negative affect have incremental validity, in terms of predicting suicide ideation above and beyond utilizing hopelessness as a predictor. Further, the importance of adding ambivalence and negative affect as predictors of suicide ideation was demonstrated both in the student sample in Study 1 and the community/clinical sample in Study 2.

Predicting Severity of Intent in Recent Suicide Attempts

In Study 2, the prediction of the severity of suicide attempts was assessed in a sample comprised of only the ideator and attempter groups. Essentially, this analysis was conducted to investigate the following question: given the presence of suicide ideation, do any of the indicators in the model have utility for predicting the severity of intent in suicide attempts? Given the presence of ideation, the measures of affect and cognitive distortions demonstrated the only significant correlations with the individual's level of suicide intent. These findings indicate that, after suicide ideation has developed, as positive affect and associated positive appraisals of self and life decreased and negative affect and associated levels of hopelessness increased, the attempters' level of self-reported intent became increasingly severe. Of these affect and cognitive distortion measures, hopelessness was the single best predictor of the individual's level of intent for recent suicide attempts. In the previous section, it was noted that both negative affect and ambivalence enhanced the overall prediction of ideation. However, this was not the case in the prediction of intent. Beyond hopelessness, the other indicators in the model did not add any significant incremental validity in terms of predicting the severity of intent of recent suicide attempts.

As was previously discussed, the BHS has a two-factor structure, which includes both an affective and cognitive component. Given the cognitive-affective factor structure of the BHS, it is

perhaps not surprising that the other measures of affect and cognitive distortions did not add any significant prediction to the equation, as these components are already incorporated in the measure of hopelessness. In summary, given the presence of suicide ideation, hopelessness, that is, a combination of negative affect and negative expectations regarding future outcomes was the best predictor of intent related to recent suicide attempts.

The Predictive Utility of Cognitive Distortions and Cognitive Deficits

Consistent with the hypotheses in the current dissertation, cognitive distortions did demonstrate utility for differentiating among non-ideators, ideators and attempters. There were significant between-group differences on all measures of cognitive distortions across the entire suicide continuum with hopelessness demonstrating the strongest linear relationship with both ideation and level of intent related to suicide attempts.

Cognitive deficits were expected to increase very little, if at all, between non-ideators and ideators, but were predicted to differ between suicide ideators and attempters. In part, the results of the current studies supported these hypotheses. As the patterns for each of the cognitive deficits measures varied, each measure will be discussed in turn. One of the measures of cognitive deficits, problem-solving avoidance, increased significantly between non-ideators and ideators, and incrementally along the entire suicide continuum. As such, the results of the current research are consistent with research (Pollock & Williams, 2004) where it was reported that suicide ideation is associated with a passive problem-solving approach. The results of the current findings, suggested that as affect became more negative, and rumination and hopelessness increased, avoidant problem-solving also increased. One possible interpretation of this finding is that, with increasing levels of hopelessness, individuals become less likely to engage in active problem-solving because they view such efforts as futile and unlikely to produce any positive outcomes.

It is interesting that in the current studies, ideators and attempters endorsed a tendency to avoid problem-solving efforts, while simultaneously reporting no actual deficits in their problem-solving abilities. As was outlined in the introduction, in their Diathesis-Stress Problem-Solving Model of Suicide, Clum and associates proposed that suicide occurs when a high level of life stress (as measured by negative life events) is combined with problem-solving deficits to produce a heightened sense of hopelessness, and thus, an increased risk of suicidal behavior (Patsiokas, Clum, & Luscomb, 1979; Schotte & Clum, 1982). Other reported findings (e.g., Yang & Clum, 1995) have not supported problem-solving deficits as an important factor in the development of suicidal thinking and behavior.

As the results of previous research investigating the relationship between problem-solving and suicide ideation and attempts have been mixed, it was difficult to predict specific problem-solving patterns with any degree of certainty. In the current dissertation, it was hypothesized that problem-solving would not differ appreciably between non-ideators and ideators, but would perhaps differ between ideators and attempters. In the current studies, no significant differences in reported problem-solving skills were found. Instead, levels of reported problem solving remained fairly constant across non-ideator, ideator, and attempter groups. Further, in the current studies, self-reported problem-solving was not significantly correlated with either hopelessness, or with suicide ideation or attempts. Considered together, the findings reported herein do not support the idea that self-reported problem-solving deficits contribute to the development of hopelessness, or to the development of suicidal ideation or attempts.

The inconsistencies between past research and the current findings related to problem-solving skills are somewhat difficult to reconcile. It is possible that these discrepancies are due to differences in sample characteristics or methodology. In the current study, problem-solving was assessed using a self-report measure. It is possible that individual's responses were biased, such

that they over-estimated their actual problem-solving skills. However, it could also be argued that this is unlikely, given the general tendency of ideators and attempters to appraise themselves in a very negative manner. Nonetheless, it is possible that problem-solving differences might have been found in the current studies if a behavioral measure of problem-solving had been used.

Alternatively, it is possible that the current findings are in fact accurate, and that problem-solving actually is intact along the suicide continuum. It has often been assumed that, in choosing to end their own lives, suicide attempters lack the appropriate problem-solving skills necessary to generate other more appropriate or positive alternatives. But, it is also possible that suicide attempters are capable problem-solvers who decide to end their lives because their problem-solving efforts are skewed due to the negative cognitive-affective state that is characteristic of this group. The results of the current studies would seem to support the second alternative. That being said, future studies are needed to further investigate problem-solving along the suicide continuum, using a variety of problem-solving measures in an attempt to resolve these discrepant findings.

The third measure of problem-solving used in the current studies was the EFT (cognitive rigidity). As predicted, cognitive rigidity increased across the suicide continuum. This noted pattern is not surprising given the established characteristics of the ideating groups in the current studies. Ideators reported moderate levels of positive and negative affect, as well as both positive and negative appraisals. Given this wide range of affect and appraisals, and consistent with expectations, ideators showed low levels of cognitive rigidity on the timed behavioral task. On the contrary, attempters, who reported primarily negative affect and appraisals and an absence of positive affect and positive appraisals, tended to demonstrate more cognitive rigidity on the timed task. Although cognitive rigidity increased significantly from non-ideators to attempters, differences between ideators and attempters were not significant. This lack of expected findings may be due to

the measure of cognitive rigidity that was utilized in the current study, as the EFT demonstrated a ceiling effect and very little between-group variance in the current study.

In summary, there were trends in the data in Study 1 and Study 2 which indicated that two of the measures of cognitive deficits (problem-solving avoidance and cognitive rigidity) were greater in ideators than non-ideators and greater in attempters than ideators. Although between-group comparisons were not always significant, especially between ideators and attempters, both cognitive rigidity and avoidant problem-solving were significantly higher in attempters than in non-ideators. It is currently unclear whether these findings are replicable or are attributable to the measures or the samples used in the current study. Additional research is required to investigate this issue. In comparison, cognitive distortions demonstrated a much stronger relationship with suicide ideation and attempts, and were consistently better predictors of suicide ideation than were cognitive deficits. Considered together, the findings of Study 1 and Study 2 provide some strong support to indicate that cognitive distortions have utility for predicting suicidal thinking and behavior.

Further, the findings of Study 1 and Study 2 also provided some support the predicted model of suicide ideation. The hypothesized model also included predictions about cognitive-affective changes in the final portion of the continuum relative to fatal suicide attempts. Given the composition of the sample in Study 2, the validity of the proposed model could not be assessed in terms of fatal suicide attempts. Consequently, the third component of this dissertation involved an exploratory study that was designed to investigate whether the proposed changes in the model were evident in a group of fatal suicide attempters.

CHAPTER 6: STUDY 3

The third study was exploratory in nature. Having assessed whether there was evidence to support the proposed relationships of the model in the cross sectional sample in study 2, the final phase of the dissertation involved determining whether the indicators and proposed relationships were also evident in a group of suicide completers. Investigating the thinking and behavior in such a sample provides some rather obvious and interesting challenges. As it was not possible to directly measure the variables under investigation, the information was collected in a post hoc manner. The next of kin of fatal suicide attempters were recruited to participate in an interview for the purpose of completing a psychological autopsy of the individuals who had died by suicide. Copies of suicide notes were also obtained for content analysis.

Psychological autopsy studies which involve in depth interviews with family members or health care professionals have been increasingly used in suicidology research (Hawton et al., 1998). Extant psychological autopsy studies have primarily been conducted to establish diagnosable psychopathology (Conwell, Olsen, Caine, & Flannery, 2005), to verify cause of death (Bhatia, Verma, & Murty, 2006; O'Donnell, Farmer, & Catalan, 1994) and to identify risk factors that potentially contributed to the suicide (Foster, 2003). While there is a general consensus in the literature that psychological autopsies are an important research tool in suicidology research (Shneidman, 1981), this methodology is certainly not without limitations. Researchers have, for example, noted that psychological autopsy studies are often associated with biased sampling, confounding variables, and a lack of adequate control groups (Pouliot & DeLeo, 2006).

When conducting psychological autopsies researchers typically select measures to address specific research questions (Pouliot & DeLeo, 2006). Consequently, a psychological autopsy interview was developed specifically for use in the current study. Given the goals of Study 3, this interview incorporated a history of psychological functioning and treatment, as well as an

assessment of cognitive deficits, cognitive distortions, affect, and rumination. This interview is discussed in greater detail in the methodology section.

It could also be suggested that psychological autopsies are limited in that the retrospective information collected during the interview may be biased. To minimize the effects of potential bias, suicide notes were also collected and analyzed in the current study to corroborate the information obtained during the interviews. Suicide notes are potentially rich sources of information that provide a glimpse into the thoughts and feelings of the individual right before their death. Shneidman and Faberow (1957) were perhaps the first researchers to utilize suicide notes in empirical studies when they studied the content of suicide notes to establish criteria for differentiating authentic suicide notes from forgeries. More recently, researchers (e.g., Bhatia et al., 2006; Leenaars, 1991) have studied the content of suicide notes to better understand the risk factors related to suicide.

In the current study, the content of suicide notes was analyzed for evidence of psychopathology, cognitive deficits, cognitive distortions, affect, and rumination. Consistent with the proposed model, it was hypothesized that fatal suicide attempts would be associated with very high levels of cognitive distortions and cognitive deficits. As such, within the psychological autopsies and the content of the suicide notes, it was expected that there would be evidence of: high levels of hopelessness, very negative appraisals of self, life, and future, (but very positive appraisals of death), high levels of cognitive rigidity, problem-solving avoidance, and problem-solving deficits. Further, negative affect was expected to be high in fatal attempters. However, given the relief associated with the decision to attempt suicide, positive affect was expected to be somewhat higher than the level observed in the attempter group. Given that the individual has, at this point, made a decision to end life, and is no longer torn between life and death, ambivalence was expected to be lower relative to non-fatal attempters.

Method

Participants

The sample for the third study was more difficult to obtain than was initially expected. The inclusion criterion included a willingness to participate in an interview to obtain information about the cognitive and affective functioning of a close family member who had completed suicide. Given that the information to be collected in the interview involved a psychological history, as well as an appraisal of the cognitive and affective functioning of their loved one within the month leading up to the suicide, the next of kin was required to have had regular contact with their loved one month prior to the suicide. In addition, the participant was asked to provide a copy of the suicide note for content analysis. Of the ten next of kin who volunteered to participate in the Study 3, only four met the inclusion criterion. A summary of the demographic characteristics of the sample of individuals who died as a result of a fatal suicide attempt is presented in Table 15.

The sample was comprised of 2 males and 2 females, who ranged in age from 19 to 57, with a mean age of 33. Three of the four individuals had completed at least two years of post secondary education, with one of these individuals attending her third year of undergraduate studies at the time of her suicide. Three of the individuals were unemployed, at the time of their suicide, whereas one person was employed on a part time basis while attending university.

Only one individual in this sample had been professionally diagnosed with a mental disorder, this being bipolar disorder. While the three other individuals spoke of mood related symptoms in their suicide notes, none of these three individuals had received a formal professional diagnosis, nor were they receiving treatment from a mental health professional at the time of the suicide. All four of the deceased in Study 3 had a history of previous suicide attempts. Further, all individuals in the sample referred to long periods of suicide ideation that preceded their fatal suicide attempt. In general, this suicide ideation had persisted for a period of several years.

Table 15:
Study 3: Demographics of Suicide Completer Group

Characteristics of the Individuals who Completed Suicide	Individual "Darren"	"Tammy"	"Ryan"	"Ashley"
Age	57	29	27	19
Gender	Male	Female	Male	Female
Marital Status	Divorced	Divorced	Single	Single
Children	2	0	0	0
Education	college	Grade 11	B.A.	2 years undergrad
Employment	unemployed	unemployed	employed	part time employment
Confirmed diagnoses	unknown	Bipolar disorder	unknown	unknown
Past diagnosis	unknown	substance abuse	depression	unknown
Recent Suicide threats	yes	yes	yes	no
Past Suicide Attempts	1	1	3	1
Method of past attempt(s)	jump infront of vehicle	overdose	overdose	slit wrists
Method of Suicide	shooting	overdose	asphyxiation	asphyxiation
Next of Kin who Participated in the interview	daughter	mother	sister	mother
Time between Suicide and last contact with deceased	12 hours	1 week	24 hours	1 week

Note: Education = last grade level completed; B.A. = Completed Bachelor of Arts degree; Confirmed diagnosis: Professionally confirmed diagnosis at time of the suicide.

Information regarding the duration of suicide ideation was found within the suicide notes and, with only one exception, it was corroborated by the next of kin during the interviews as well.

Measures

A structured interview, the "Structured Survivor of Suicide Interview" [SSOSI] was developed for the present study to obtain demographic information, details about the suicide, and a psychiatric and treatment history for the deceased. Information regarding the cognitive and affective functioning of each individual prior to their suicide was also gathered during the interview. The SSOSI was designed to incorporate the assessment of cognitive deficits, cognitive distortions, affect, rumination, coping and perceived social support. On each of these dimensions, the interviewee was asked to provide an estimate of these variables over time, indicating how their loved one functioned on these cognitive and affective domains "typically" and "one month prior to the suicide". The SSOSI is described below in more detail below (also see Appendix N).

Cognitive Deficits One component of the SSOSI involved having the interviewee indicate the degree to which their family member demonstrated intact cognitive processes. Utilizing a Likert-type scale (where 1 = "not at all" and 7 = "completely"), each interviewee was to indicate the degree to which their loved one exhibited problem-solving, decision making, attention, and memory. Potential scores for each of these skills ranged from 1 to 7, with low scores indicating cognitive deficits.

Cognitive Distortions A second component of the SSOSI involved asking the interviewee to indicate whether the deceased typically exhibited the following: hope, dichotomous thinking, overgeneralization, catastrophizing, bizarre beliefs/delusions, and hallucinations. Interviewees provided this information on a Likert-type rating scale, where 1="not at all", and 7= "completely". With the exception of hope, low scores were indicative of cognitive distortions.

The SSOSI also included a modified version of the General Attitudes Scale (GAS). For this section of the interview, the interviewee was asked to indicate how positively the deceased appraised: self, others, future, life, death, and ability to cope. Again a Likert-type scale was utilized, where 1="very negatively", and 7= "very positively". With the exception of death, (where a high score indicated a distortion), low scores represented cognitive distortions.

Affect An additional component of the SSOSI was designed to collect information about the affective functioning of the deceased. These affective factors included, difficulties expressing both positive and negative emotions, as well as a modified version of the PANAS, where the interviewee was asked to estimate levels of affect for the deceased. This modified version of the PANAS was embedded within the SSOSI (see Appendix N). The first 20 responses on the PANAS were used to calculate a negative affect (NA) and positive affect (PA) score. Scores on the PA and NA scales can assume values between 10 and 50, with higher scores representing higher levels of affect. The last two items on the modified PANAS scale were used to assess anger directed at self and anger directed towards others. Each of the anger scores ranged from 1= "very slightly or not at all" to 5= "extremely".

Rumination The interviewee was also asked to estimate the degree to which his/her family member engaged in ruminative thinking. Scores on the rumination item could assume a value ranging from 1= "not at all" to 7= "always".

Suicide Preparatory Behavior A further section of the SSOSI involved information about the "leave-taking" behavior that the deceased engaged in prior to the suicide. "Leave-taking" behavior included activities such as writing a will, making funeral arrangements, giving away possessions, and/or writing a suicide note.

Other Information As the psychological autopsies collected in Study 3 will also be included in another study several other variables, that were not included in the current dissertation,

were also included in the SSOSI. These variables included information about the suicide completer's personality, relationships, range of affect, affective lability, perceived social support, and recent stressors.

Procedure

Participants were briefed about the study, and asked to complete an informed consent. The Information Sheet and Informed Consent that were utilized in Study 3 are presented in Appendix O and Appendix P, respectively. A copy of the suicide note was requested, and all identifying information was removed from the notes to protect the anonymity of the deceased and their families. Following the completion of the interview, the participant was debriefed. Referrals to support services in the community were also made at this time. The Feedback Sheet is presented in Appendix Q and the Referral to Community Support Services sheet is presented in Appendix M.

Content analysis of the suicide notes Several options were considered for presenting the information from the suicide notes. One of these options involved developing an objective rating system to code and quantify the contents of the suicide notes. From a methodological perspective, an objective rating scheme did not seem justified given the small sample size. In addition, it was decided that presenting the information in this manner would not adequately capture the rich content and detail of the suicide notes, or the lives of those who wrote the notes. Furthermore, suicide notes are not objective, but rather, are very subjective and deeply personal statements. Given the aforementioned reasons, combined with the wide variation in the length and content of the suicide notes, it was decided that the content of each suicide note would be summarized individually. Initially, it was hoped that the suicide notes could be included in the appendix in their entirety after all identifying information had been removed. However, the next of kin who provided copies of the suicide notes were not comfortable with this request. The next of kin did consent though to using quotes from the suicide notes. As such, the summary of each suicide

note includes direct quotes that were considered to be indicators of cognitive distortions, cognitive deficits, affect, and rumination of the deceased. It should also be noted that the all names were changed to protect the anonymity and privacy of each individual who died by suicide and their respective families.

Results

Psychological Autopsy Interviews

During the psychological autopsy interviews, the next of kin provided estimates of their loved one's cognitive and affective functioning, both "typically" and "one month prior to the suicide". The descriptives for these estimates are presented in Table 16.

Next of kin estimated that their loved one typically had moderate levels of hope, but also indicated that levels of hope decreased substantially within the month prior to the suicide. Estimates of their loved one's positive appraisals of self, others, future, life, and death were typically moderate. As predicted, the next of kin reported decreases in their loved one's positive appraisals within the month prior to the suicide. The most notable decreases in positive appraisals were related to evaluations of self, life, and future. The next of kin reported that their loved ones typically evaluated death in manner that was moderately positive, and that these evaluations of death became more positive in the month prior to the suicide. When considered together, these findings suggested that cognitive distortions become more severe as individuals, who are contemplating suicide, move towards making a fatal suicide attempt.

During the interviews, the next of kin also estimated their loved one's level of cognitive deficits. In general, these estimates indicated that the rated individuals typically had adequate (moderate) levels of cognitive functioning including problem-solving, decision making, attention, and memory. Next of kin estimates also indicated that these cognitive skills decreased slightly in

Table 16:
Study 3: Descriptive Statistics for Estimated Cognitive distortions, Cognitive Deficits, Affect, and Rumination in the Suicide Completion Group

	Typically		Month Prior to Suicide	
Measure/Indicator	**Mean**	**S.D.**	**Mean**	**S.D.**
Cognitive Distortions				
Hope	4.25	1.71	1.50	1.00
GAS-S	3.00	1.41	1.75	.96
GAS-O	5.00	.82	4.50	2.38
Gas-F	4.00	2.16	1.75	1.50
Gas-L	4.25	1.26	2.50	1.73
Gas-D	4.25	.96	5.50	1.73
Dichotomous thinking	5.25	2.82	6.00	1.41
Overgeneralizing	5.00	1.16	5.50	1.00
Catastrophizing	3.25	2.06	3.75	2.22
Delusions	1.25	.50	1.25	.50
Hallucinations	1.50	1.00	1.50	1.0
Cognitive Deficits				
Problem-solving	4.25	1.26	3.25	1.71
Decision Making	3.75	1.26	2.75	1.50
Attention	2.50	1.00	1.75	.50
Memory	4.25	1.50	3.00	1.83
Affect				
PANAS-PA	31.50	5.92	23.00	6.00
PANAS-NA	30.00	9.27	32.00	13.88
Anger (Self-Directed)	3.75	1.26	3.75	1.50
Anger (Other-Directed)	3.50	.58	3.25	.50
Rumination				
Tendency to Ruminate	5.00	.82	5.50	.38

NOTE: N=4
GAS-S= General Attitudes Scale-Self Orientation; GAS-O = General Attitudes Scale-Other Orientation; GAS-F = General Attitudes Scale-Future Orientation; GAS-L = General Attitudes Scale-Life Orientation; GAS-D = General Attitudes Scale-Death Orientation; PANAS-PA = Positive and Negative Affect Scale-Positive affect; PANAS-NA = Positive and Negative Affect Scale-Negative affect.

**The above information was collected during the psychological autopsy interviews with the next of kin*

the month prior to the suicide. Considered together, these ratings would suggest that the suicide completers in Study 3, experienced a slight increase in cognitive deficits in the month prior to their fatal suicide attempt. Again, these findings are consistent with the hypotheses in the current dissertation.

During the interviews, the next of kin also completed an adapted version of the PANAS to estimate the affective functioning of their loved one, typically, and one month prior to the suicide. These ratings indicated that the individuals typically expressed moderate levels of both negative and positive affect. In the month prior to the suicide, negative affect changed very little.

Observed changes in positive affect in the month prior to the suicide varied somewhat depending on the source of information. When considering the mean changes in positive affect that were reported on the adapted PANAS, positive affect decreased in the month prior to the suicide. However, it should be noted that during the interview, the next of kin for two of the suicide completers (i.e., Ashley and Tammy) commented that they had noticed an increase in certain types of positive affect in the month prior to the suicide. Specifically, it was noted that both Ashley and Tammy had seemed happier and more at peace than they had seemed in some time.

It is also notable that the estimated mean level of PA in suicide completers (M=23.00) is higher than the mean level of PA (M=15.45) reported by the non-fatal suicide attempters from Study 2. Given the small sample in Study 3, and the fact that these estimates were derived from very different sources (i.e., self-report versus other-report) it was not possible to directly test whether this difference was significant. However, it is notable that this trend is consistent with the expectation that positive affect would be higher in completers than in attempters.

During the interview, the next of kin also estimated their loved one's level of anger. These ratings indicated that they believed that their love ones typically experienced moderate levels of both self-directed and other-directed anger and that their loved one's levels of anger did not

change noticeably in the month prior to the suicide. It is notable that these estimates are consistent with statements in the suicide notes and are also consistent with the findings in Study 2.

Suicide Note Analysis

The following case studies provide an overview of each individual's history and integrate information from the psychological autopsy interview, as well as a summary of the contents of his/her suicide note. By necessity, the summaries are brief, and in no way capture the richness and complexity of each individual or his/her life. These vignettes were challenging to write and for some readers may be unsettling to read.

Case Study 1: "Darren"

> Darren was a 57 year old Caucasian divorced male with two adult children. Darren had been unemployed for the 2 years prior to his suicide, and was reportedly experiencing significant financial distress. He had a long history of substance abuse. In his suicide note, Darren indicated that he used cocaine and marijuana regularly, well into his early forties, and binge drank on a weekly basis. Darren apparently drank up until the time of his death, but according to the coroner's report, Darren had not consumed any alcohol immediately prior to his suicide. From the psychological autopsy interview with his daughter, it was unclear whether Darren had been professionally diagnosed with a mood disorder, but he had been prescribed antidepressants, which he reportedly took sporadically the month prior to his suicide. During the interview, his daughter indicated that for a month prior to his suicide, Darren had seemed apathetic and depressed and had often called his family in tears. During the interview, his daughter indicated that Darren previously attempted suicide (1995) by jumping in front of a moving vehicle. Later in 1995, Darren had threatened to shoot himself, but a close friend had intervened and taken him to the hospital. During the interview, Darren's daughter reported that he spoke of suicide periodically, and these comments increased in the month prior to his suicide. During one of their last telephone conversations, Darren had apparently told his closest friend, "I am going to go with a bullet in my head".
>
> Darren's 15 page hand-written suicide note was addressed to his ex-wife and two children. His suicide note, which begins with "My True Confessions", recounts a lifetime of "mistakes and transgressions" beginning in childhood and continuing throughout his adult life. Throughout his entire suicide note, Darren speaks of himself in very negative terms. For example, he wrote, "I am a disgrace", "sick and stupid", and "I am still the same way I ever was, evil". While he describes the others in his life in primarily positive terms, Darren continually describes himself as despicable and unworthy of the love and support that he has received from others. In his suicide note he also wrote "once you have this note and know what a disgusting person I have been for my entire life, you will surely be ashamed to know me". Regarding his life he wrote, "My life is a hopeless mess that no one can fix. I can go on no longer".

Regarding the effect of his suicide on his family, Darren wrote "this mess I am leaving you will be unbearable". Of his own outcome Darren wrote, "Do not wonder what will become of me. I will most definitely be with the scum of the earth where I belong". In his suicide note, Darren also discussed how he had been feeling, indicating that for several weeks, he had been unable to eat, had lost 25 pounds, was unable to sleep, and spent most nights pacing the floors. He also wrote about being unable to think clearly (e.g., "I cannot focus, my mind is gone, and I am getting more stupid every day"). Despite these self-reported cognitive difficulties, the suicide note contained several pages of clearly delineated financial arrangements and bequests, which included references to having contacted his lawyer and life insurance agent over the previous weeks.

Darren also wrote that he had been seriously contemplating suicide for several months. In terms of affect, Darren briefly mentioned the love and gratitude he felt towards his family, but otherwise, the suicide note was filled with pain, guilt, shame, and regret. Darren's suicide note ended with the following statement, "P.S. The police will likely wonder about the gun, I got it from a friend, and this is the first and last firing of it, by me". Darren died of a self-inflicted gun shot wound to the head on April 21, 2003.

Evaluative Summary: An analysis of Darren's suicide note indicated there was limited positive affect, but evidence of high levels of: negative affect, cognitive distortions (hopelessness and negative appraisals of self, life and future), and some evidence of cognitive deficits (i.e. one statement indicating problem-solving deficits).

Case Study 2: "Tammy"

Tammy was a 29 year old divorced Caucasian female who was residing with one female friend at the time of her death. During the psychological autopsy interview, her mother indicated that, at 22 years of age, Tammy had been diagnosed with bipolar disorder. Despite ongoing treatment, Tammy had struggled with severe episodes of depression and mania, and had been hospitalized on several occasions when she developed psychotic symptoms in conjunction with a manic episode. Tammy had also reportedly spent 3 months as an inpatient (2001) for treatment of substance abuse (Ecstasy). In addition, Tammy had been hospitalized briefly at the age of 15 following a suicide attempt (i.e., she had slit her wrists and was found unconscious in the bath tub).

In Tammy's one page hand written suicide note, she indicated that she had wanted to write an individual note for everyone, but "was just too tired". Referring to her chronic illness and her decision to end her life, she wrote, "I can't tame the beast within". During the interview, her mother indicated that Tammy felt hopeless about ever being able to overcome her illness. These ideas were reflected in her suicide note, when Tammy wrote, "No matter how hard we tried we couldn't make me fit".

With her suicide note, Tammy left a book for her mother. The book, which was entitled, "After Suicide", was written to help survivors cope with the suicide of a family member. Clearly, Tammy had considered how her suicide was going to impact her mother.

In terms of affect, Tammy expressed in her suicide note love and appreciation for her friends and family. During the interview, her mother reported that for several weeks prior to her suicide, Tammy seemed happier and more at peace than she had been in many years. Regarding her decision to end her life, Tammy wrote, "It's time for me to go home". In general, the affective tone of the suicide note was one of peace, resignation, and

acceptance. She wrote, "My time was up when I was 15 and every day since then has been a struggle."

During the interview, her mother indicated that Tammy had often expressed suicidal thoughts, and had spoken of death as a release from her ongoing suffering. Tammy's suicide note ended with the following statement, "P.S. There was not one thing that brought me here. I've been at these crossroads for years and I finally just got the guts to choose." Tammy died of a fatal overdose on September 26, 2005.

Evaluative Summary: An analysis of Tammy's suicide note indicated there was evidence of a moderate level of positive affect, high levels of: negative affect, and cognitive distortions (hopelessness and negative appraisals of self and future and positive appraisals of death). In terms of cognitive deficits, Tammy's suicide note contained statements that were indicative of problem-solving avoidance, but not problem-solving deficits.

Case Study 3: "Ryan"

Ryan was a 27 year old single male. Although he had completed a university degree, he was unemployed and living with his parents at the time of his suicide. During the interview, his sister reported that he had a history of suicide attempts. Ryan's first suicide attempt occurred in 1987 after he received a serious neck injury in a car accident that left him unable to pursue his career. Two other suicide attempts (also by overdose) occurred in 1989 and 1992. The details of these suicide attempts were corroborated by information in his suicide note. While in university, Ryan had been treated with psychotherapy for depression. However, Ryan was not in the care of a mental health professional at the time of his suicide. Whether Ryan would have met the diagnosis for a psychological disorder is unclear. His sister reported that Ryan often seemed depressed. In his suicide note, Ryan reported that for the month prior to his suicide, he had "felt like doing nothing but sleeping", and hadn't looked for a job because "looking for a job when you are planning on killing yourself is a pointless venture." Ryan's sister also reported that he occasionally binge drank. Despite his sporadic use of alcohol, the coroner's report indicated that Ryan had not consumed alcohol prior to his suicide. In his suicide note, Ryan indicated that he did not regularly use drugs, but was planning to smoke marijuana prior to his suicide attempt. In his suicide note, Ryan wrote, "No, I'm not a druggie. I got a pot joint from an acquaintance of an acquaintance, to put me in a better mood for what I am about to do."

Ryan left a six page typed suicide note that was entitled "Ryan's Suicide Note". During the interview, Ryan's sister described him as an introverted individual who was introspective and very perfectionist. Ryan's sister also indicated that Ryan would often perseverate about his shortcomings, and spoke to her about his perceived faults incessantly. In his suicide note, Ryan spoke of himself and his future in the following way: "I have nothing, no goals, no career plans, no significant other....The only thing that I have done well in life is procrastinate." About life, Ryan wrote, "I have never been able to find my own direction or true happiness", "Life sucks (a lot)", "You wish you were dead, so you kill yourself", and "Life is pointless, I won't miss living the rest of my life."

While Ryan wrote of his life and his future in negative and absolute terms in his suicide note, he reflected on a more positive future for his loved ones; a future that he would miss. For example, he wrote. "There are things in other people's lives that I will

miss. Maggie will meet Mr. Right to make her life complete. Sam and Sharon will have beautiful children and watch them grow into adults".

Ryan's suicide note also included several pages of very detailed instructions regarding the distribution of his assets and his funeral arrangements. His funeral requests included-what he wanted to wear for his funeral, what songs he would like played at his funeral service, and a request that no one buy flowers. In his suicide note, he wrote, "Instead of flowers, which are just going to die too, I would rather have donations made for suicide hotlines."

In general, the affective tone of Ryan's suicide note was one of sadness, loneliness, and resignation. Ryan had experienced suicide ideation for several years prior to his fatal suicide attempt. In his suicide note, Ryan wrote, "I have wanted to kill myself off and on for the past nine years." Regarding his decision to end his life, in his suicide note, Ryan included several quotes from his favorite songs. These quotes included the following: "You stand on your own, and you go home on your own, and you cry and you want to die"; "I can't stand the pain anymore", and "Don't feel bad for me, I want you to know, that deep in the cell of my heart, I will feel so glad to go". Ryan's suicide note ended with the following statement: "I hope that everyone can find their own direction and happiness in life, and live long and prosper". Ryan died by asphyxiation in his parent's garage on March 12, 1999.

Evaluative Summary: Ryan's suicide note contained evidence of a moderate level of positive affect and high levels of: negative affect, and cognitive distortions (hopelessness and negative appraisals of self and future and positive appraisals of death). Ryan's suicide note also contained statements indicating that he ruminated (especially about suicide) but there were no statements that were clearly indicative of cognitive deficits.

Case Study 4: "Ashley"

Prologue: In addition to providing a copy of the suicide notes, Ashley's mother provided a copy of Ashley's journal entries for several years prior to her suicide. Any information included in the summary that was taken from Ashley's journal entries will be identified as such. All other information in the summary was collected during the interview with her mother or from Ashley's suicide notes.

Ashley was a nineteen year old single female who was residing with her brother and two other room mates at the time of her suicide. Ashley was actively involved as a volunteer at her church and in the community, and was pursuing an undergraduate university degree. Those closest to her, reported that they believed that Ashley was doing well. During the interview, her mother indicated that Ashley had not been formally diagnosed with any type of psychological disorder, nor was she receiving any kind of treatment immediately prior to her suicide. Statements from Ashley's' suicide notes indicated that Ashley was feeling depressed prior to her suicide. For example, in her suicide note she wrote, "there is nothing anyone did to make me depressed like this", "all I feel is pain", "I've lost interest in everything, and don't enjoy anything" and "I've had thoughts of suicide for the past 5 or 6 years." Whether Ashley would have met the diagnostic criteria for a major depressive episode cannot be substantiated on the basis of these statements. However, it is clear that

Ashley was experiencing negative affect, anhedonia, and suicide ideation when she wrote the suicide notes.

Ashley's mother indicated that Ashley had made one previous suicide attempt at the age of fifteen (in 2000). At that time, Ashley had reportedly slit her wrists, and was found bleeding in the washroom at her high school. Following this suicide attempt, Ashley received treatment for several months to address her "stress and adjustment issues." The statements that Ashley wrote in her journal following this suicide attempt indicated she felt no one really understood, and that her suicide ideation persisted despite this treatment. Whether or not Ashley informed the treating clinician of her persistent suicide ideation is unclear. Ashley's family and friends reported that they were unaware that Ashley was feeling as distressed or suicidal as her journals entries suggested.

Ashley left a series of hand-written suicide notes, with one addressed to her parents, and several other letters addressed to close friends. In her suicide notes, Ashley referred to herself in very negative terms. For example, she wrote, "Everywhere I look, I seem to be looking in the face of failure". Ashley had been experiencing these very negative self evaluations for some time. Over several years, her journal entries were filled with statements such as: "I am ugly", I'm a complete failure", "I am a freak, plain and simple." "I am empty, hollow, nothing." and "My God, there is something very wrong with me".

In terms of affect, in her suicide notes, Ashley expressed love for her family and friends, and regret for hurting anyone with her decision. She wrote, "This doesn't mean that I wanted to cause pain for the people that I loved or that it was easy to let you go". Otherwise, Ashley's suicide notes are filled with pain and fear. In her suicide note to her parents, Ashley wrote, "All I feel is pain, there is nothing in life to enjoy", "I am scared", "the pain envelopes me and is unbearable".

Regarding her feelings about her future, Ashley wrote in her suicide note, "By dying, I don't think I'll be missing anything in the future although others may disagree". Regarding her feelings about life and death, Ashley wrote in one of her suicide notes: "I wasn't happy anymore with anything in life", "You know you hate life when all you look forward to is your death", and "in death, at least I'm better off now". Ashley had been experiencing suicide ideation for several years prior to her decision to end her life. In her suicide note to one of her best friends, she wrote, "I've had thoughts of suicide for 5 or 6 years". In her journals, Ashley often made reference to wanting to die. She wrote, "I should kill myself" (2001), "soon I'll be dead" (2002), "I want to kill myself. I can taste it now oh sweet freedom from this life" (2003), and "I yearn for death, the sweet taste of release" (2004).

In terms of her making the decision to end her life, Ashley wrote in her suicide notes, "my problems seem impossible to get over, they just keep building and I don't know what else to do." Despite the long history of suicide ideation that was evident in her journals, Ashley apparently never spoke of these thoughts to others. No one close to Ashley had anticipated her suicide. Several weeks before her suicide, Ashley visited her parents for Thanksgiving. In retrospect, her parents indicated that they didn't notice that Ashley seemed distressed during this weekend. In fact, they commented that she seemed rather calm given that she was in the midst of writing mid term exams at university. This brief visit was the last time they would see their daughter.

According to entries in her journal, Ashley had been actively planning her suicide for several months. This planning had included buying a computer to research various

suicide methods on the internet, making final preparations, writing a series of suicide notes, and purchasing the supplies necessary to complete her final act. On the morning of her last day, Ashley (who was home alone) went into the backyard and lit her recently purchased hibachi (portable BBQ). Once fully ignited she carried the hibachi into the house and into her bedroom. Once in her bedroom, Ashley carefully taped shut all the windows, doors, and vents in her bedroom, making her room airtight. Later that evening, Ashley did not respond when her brother, who had just returned from their university courses, called her for dinner. Still later that evening, Ashley's brother and room mates broke down her bedroom door to find Ashley lying lifeless in her bed. Ashley died by asphyxiation on October 30, 2005.

Evaluative Summary: An inspection of *Ashley's suicide note provided evidence of a moderate level of positive affect and high levels of: negative affect, and cognitive distortions (hopelessness and negative appraisals of self, life and future and positive appraisals of death). Ashley's suicide note contained statements that were clearly indicative of cognitive deficits, including both problem-solving avoidance and problem-solving deficits. A tendency to ruminate (especially about suicide) was also evident in Ashley's suicide note.*

Summary of Suicide Note Content

The suicide notes and psychological autopsy interviews provided a great deal of rich, very personal information. In some ways, each suicide was as unique as the individual writing the note. Yet the suicide notes also contained some commonalities. For example, in their suicide note, each individual attempted to explain to loved ones the reason for their decision to end their life. In each suicide note, it was stressed that it was not any one single event, but rather, a culmination of many factors that had ultimately influenced their decision to take their own life. In all of the suicide notes, there was finality about the decision. In a few instances, the wording of the suicide note was even written as though the suicide had already occurred. Ashley's statement "in death, at least I'm better off now" clearly exemplifies this finality. Further, in each of the suicide notes, there was evidence that the individual had considered the effect that their suicide would have on their loved ones.

There were also some commonalities that emerged during the psychological autopsy interviews. Most notably, each individual had made at least one prior suicide attempt and had been experiencing suicide ideation for some time prior to the suicide, typically for several years before

the fatal attempt. And in all cases, the suicide ideation had persisted, at least sporadically, from the time of the earlier attempt. Despite this long history of suicide ideation, only one of the individuals (Tammy) was actually receiving ongoing treatment at the time of the suicide. Tragically, treatment did not prevent her untimely death.

The content of the suicide notes was examined for evidence of cognitive distortions, cognitive deficits, affect, and rumination. Many of these statements were integrated into each case study summary, and a compilation of some of the relevant quotes is presented in Table 17. The suicide notes contained many statements that were indicative of cognitive distortions, including very negative evaluations about self. It is also remarkable that there were no positive self-evaluative statements in any of the suicide notes. The manner in which the individuals referred to others in their suicide notes varied somewhat. A few statements regarding others were negative (e.g., "He is a horrible person and I don't want him involved in my funeral"). However, the majority of other-related statements were positive (e.g., "your mother was a beautiful person and still is"). Evaluations of the future, also varied, but this variation depended on whether the statements were related to personal future or the future of others. The statements regarding the individual's personal future were very hopeless, while statements related to the future of others were primarily positive.

In general, the statements in the suicide notes supported the idea that individuals who make fatal suicide attempts evaluate life in a negative manner and death in a positive manner. Evaluations of life included statements such as- "Life sucks (a lot)", "I hate life", and "Life kills me". On the contrary, death was welcomed and viewed as a release, as the following statements clearly indicate: "I yearn for death.", "in death I am better off now", and "death, the sweet touch of release".

Overall, relative to cognitive distortions, there were fewer examples of cognitive deficits in the suicide notes. One type of cognitive deficit that was readily apparent in the suicide notes was cognitive rigidity. The suicide notes were characterized by very fixed and rigid thinking about

Table 17: *Statements from Suicide Notes Indicating Cognitive Deficits, Cognitive distortions, Affect, and Rumination*

Cognitive Deficits	
Cognitive Rigidity	"I'm already dead" "It's too late"
Problem Solving Deficits	"I wasn't sure what else I could do." "I cannot focus, my mind is gone, I am getting more stupid every day"
Problem Solving Avoidance	"I have been avoiding making this decision" "I have been at this cross roads for a long time"
Cognitive Distortions	
Self	"The only thing I've done well in life is procrastinate". "Everywhere I look, I seem to be looking in the face of failure" "Mostly about small things that I would make into huge things" "I was not worthy of anything". "I will most definitely be with the scum of the earth where I belong" "I know that I am an absolute failure" "I am still the same way I ever was which is evil".
Future	"I have no future". "I had nothing left to live for" "There is no better tomorrow"
Hopelessness	"There's nothing anyone can do to fix this". "My time was up when I was 15 and every day since then has been a struggle." "Things were getting way too hard for me to handle".
Life	"Life sucks (a lot)" "You know you hate life when all you look forward to is your death".
Death	"I yearn for death." "in death I am better off now" "death, the sweet touch of release".
Affect	
Negative Affect	"I've never been able to find my own direction or true happiness" "I wasn't happy anymore with anything in life" "I was very scared of what was going to happen [the suicide]" "I know it is better than waking up not feeling anything but pain". "It wasn't anything anyone did to make me depressed like this". "I lost interest in everything" "I am really sorry for what I have done but I was depressed." "With the amount of hurt and pain I am about to inflict on those closest to me". "The pain surrounds me"
Positive Affect	"I will be so glad to go [die]" "I love you all more than I can show" "I love you". "I'm glad I had you as a friend". "The joy of life was drained from me".
Rumination	"I have been thinking about suicide for five or six years".

Note: These statements are direct quotes taken from the suicide notes that were collected in Study 3. In accordance with the statement of confidentiality, all names have been changed to protect the anonymity of those involved.

suicide as the singular correct outcome. The statements in the suicide notes contained no evidence of uncertainty regarding the decision to die by suicide. Further, several of the suicide notes included statements that "there was nothing that anyone could have done to change the outcome". Considered together, these findings would suggest that the thinking of the individuals was very fixed or rigid, immediately prior to the suicide.

In two of the suicide notes there were statements that were indicative of problem solving deficits (e.g., I wasn't sure what else I could do."). However, the content of the suicide notes also demonstrated planning and decision making skills. In their last hours, in writing the suicide notes, individuals seemed to have mental clarity. The majority of the notes included very detailed last wishes regarding funeral arrangements, and the disposition of the individual's assets and possessions. In two of the suicide notes, these details were so extensive that they filled several handwritten pages. Considering the amount of detail and thought that went into these extensive written arrangements, it would seem that these individuals were capable of both planning and decision making at the time the suicide note was written.

The content of the suicide notes was also examined for indicators of affect. In general, affect in the suicide notes was identified in terms of statements that contained affect-related words. The statements in the suicide notes evinced both positive and negative affect. Examples of positive affect, included "I love you", and "I'm glad I had you for a friend", while exemplars of negative affect included statements such as, "I wasn't happy anymore with anything in life" and "the pain surrounds me". Although there was evidence of both positive and negative affect in the suicide notes, there were relatively more examples of negative than positive affect. Further, many of the positive affective statements were related to death. For instance, the suicide notes contained statements such as, "I will be so glad to go [die]", and "I yearn for death".

Another pattern that was obvious in the suicide notes was that the expression of positive affect in the suicide notes was associated with feelings for significant others. In general, the individuals who wrote the suicide notes referred to loving those they were leaving behind. Despite these statements of positive affect, in writing the suicide notes, individuals also indicated that such feelings were not sufficient to prevent their suicide. For example, Ryan wrote, "Sorry but family and friends are not enough without everything else", and Tammy wrote "your love and support kept me here this long but is no longer enough". When considered together, these affective statements indicated that the suicide notes were characterized by both positive and negative affect. Patterns of affect were also skewed such that negative affect was associated primarily with self and life, whereas positive affect was associated primarily with significant others and death.

Consistent with the goals of Study 3, the suicide notes were examined for any evidence of rumination. In general, it was much more difficult to identify exemplars of rumination in the suicide notes. One notable instance of rumination was the fact that in their suicide notes, all individuals referred to thinking about suicide for long periods of time. Often individuals reported that thoughts of suicide had persisted for many years. Other than the self-reported chronic suicide ideation, there were no direct statements related to rumination in the suicide notes. This lack of clear statements related to rumination in the suicide notes does not necessarily preclude a ruminative tendency on the part of the suicide completers. Rather, it may be that rumination is more difficult to ascertain based on a sample of the individual's stated behavior at one point in time. That is, it would be much easier to demonstrate evidence of rumination in samples of statements made on numerous occasions over a longer period of time. It is also noteworthy that the next of kin reported that their loved one's typically demonstrated moderate to high levels of rumination and these ruminative tendencies remained fairly constant in the month prior to the suicide.

In summary, there was extensive evidence of cognitive distortions in the content of the suicide notes. These distortions included hopelessness and negative evaluations regarding self, life, and personal future. On the contrary, evaluations of death were decidedly positive. The suicide notes contained evidence of both positive and negative affect, with a greater prevalence of negative affect. Statements that indicated cognitive deficits were more difficult to identify in the suicide notes. Even so, there was some evidence of cognitive rigidity, problem solving avoidance, and problem solving deficits in the suicide notes.

Discussion

Study 3, which was exploratory in nature, was designed to examine whether the predicted patterns of cognitive distortions, cognitive deficits, affect, and rumination were evident in a sample of individuals who had died as a result of a fatal suicide attempt. As predicted, there was evidence of numerous cognitive distortions in the suicide notes. These distortions included statements that were indicative of hopelessness, as well as very negative evaluations of self and future. Appraisals of others were mixed. Suicide notes contained evidence of both positive and negative appraisals. However, while mixed, appraisals of others were more often positive than negative and statements regarding the future of others were primarily positive. Consistent with the hypotheses, the content of the suicide notes indicated that individuals appraised death as very positive and life as very negative immediately prior to a fatal suicide attempt. Further, these observed patterns of cognitive distortions were also reported by the next of kin during the psychological autopsy interviews.

As was also predicted, the suicide notes also contained some evidence of cognitive deficits. These cognitive deficits included cognitive rigidity, problem solving avoidance, and self-reported problem solving deficits. Further, during the interviews, the next of kin reported levels of these cognitive deficits that were even greater than those which were apparent in the suicide notes. Relative to the cognitive distortions, there was less evidence of cognitive deficits in the

suicide notes. However, it is unclear whether this observed difference is a true indication of a greater severity of cognitive distortions than cognitive deficits in the suicide completers, or whether this observed difference is a result of the fact that cognitive deficits are less easily identifiable given their nature. Subsequent research is required to more definitively evaluate the relative utility of cognitive deficits and cognitive distortions in the prediction of fatal suicide attempts. Given the observations in Study 3, it can be concluded that individuals who make fatal suicide attempts demonstrate both cognitive deficits and cognitive distortions and further investigation is warranted.

As was also predicted, there was evidence of rumination in the suicide notes. In particular, there were numerous statements indicating that the individuals had thought about suicide for a long period of time prior to their fatal attempt. Next of kin reported that their loved ones typically demonstrated ruminative thinking, not only related to suicide ideation, but as a general tendency as well. Further, the next of kin reported that these ruminative tendencies persisted and were noticeable in the month prior to the fatal suicide attempts.

Consistent with the hypotheses in Study 3, the suicide notes contained statements that indicated high levels of negative affect. While the suicide notes also contained statements indicative of positive affect, there were relatively more negative affective statements. These trends were verified by information gathered during the interviews with next of kin.

Given the overwhelmingly negative content of the statements in the suicide notes evaluating self, personal future, and life in general, it is not surprising that there were no statements in the suicide notes that were indicative of ambivalence as it pertained to life and death. Rather the suicide notes contained statements characterized by a high degree of certainty, and in some cases, a wish that the decision had been made earlier. Consistent with the high level of certainty was the observation that numerous statements in the suicide notes were written in past tense, as though he/she had already died or no longer existed. For example, in one of the suicide

notes the individual wrote, "I'm gone. You cannot reach me". Statements such as, "There isn't anything anyone could have done" also seemed to suggest that the individual felt that the outcome was inevitable. Statements also reflected the feeling that they "should have died" much earlier than the actual suicide, as though they were living on "borrowed time". These findings indicated that fatal suicide attempters do not exhibit ambivalence prior to their suicide attempt, at least as it pertains to self, personal future, life and death. When considered together, the information that was collected from the suicide notes and next of kin interviews, although exploratory in nature, supported the predictions of Study 3.

There were a few limitations associated with Study 3 that are worthy of discussion. One notable concern involved the potential biases associated with the information that was collected during the psychological autopsy interviews with the next of kin. On the one hand, it could be argued that the information provided by the next of kin was accurate for a number of reasons. Specifically, it is often the case that suicide survivors cognitively ruminate about all of the events that preceded the suicide in an attempt to understand the untimely death of their loved one (Fazakas-DeHoog, 1998). This rumination includes the events that lead up to the suicide, as well as recollections of how the deceased was acting and feeling prior to the suicide. Thus, survivors' recollections of these events are rehearsed so extensively that it could be argued that the memory of these events would become over learned and persist accurately over time. Further, it is often the case that the suicide is perceived as very traumatic for many of the survivors. Research that has investigated the impact of trauma on memory has indicated that traumatic memories are distinct from normal memories in that traumatic memories formed during a period of intense emotion tend to become more fixed and more accurate than memory for non-emotional events (Kensinger, 2006). This being the case, the information that is reviewed by the survivors immediately following

the suicide, including the words and actions of the deceased prior to the suicide, may become accurately fixed in memory.

However, it is also possible that survivors' memories of the events preceding the suicide become skewed or biased over time. As was discussed in the introduction, surviving family members often struggle to understand the suicide of their loved one. In attempting to understand this tragic and untimely death, suicide survivors may also infer the thoughts and feelings of their loved one based on the outcome, that is, the suicide. For example, survivors may deduce that their loved must have been feeling hopeless and depressed because he/she died by suicide.

Given the potential for memory biases, every effort was made during the next of kin interviews to ensure accurate reporting. During the interview, when reporting the cognitive and affective functioning of their loved, the interviewee was prompted to specify examples of actions or behaviors that were related to the affect or cognitive process that was being evaluated. For example, when estimating whether their loved one expressed negative self appraisals, the interviewees were asked, "Can you recall any specific negative statements that your loved one made about himself (or herself)?" Despite the efforts to ensure the accuracy of the information collected during the interviews, it is still possible that some of the information is biased, given the aforementioned issues with memory biases. These potential biases are difficult to overcome given that the information is, by necessity, collected retrospectively. While the potential for biased recollection is noted, it is worthy of mention that the information collected during the interviews was consistent with the content of the suicide notes.

A further limitation of Study 3 was the small sample size, which precludes a generalization of the findings. Inclusion criterion for Study 3 involved: access to a suicide note, and a willingness both to provide a copy of the suicide note and to participate in psychological autopsy interview. Initially, it was hoped that a sample of 50 suicide completers could be recruited for Study 3. This

estimate was considered reasonable, as the principle investigator was actively involved in an ongoing suicide survivor support program offered through the Canadian Mental Health Association, and had access to the population of interest. However, the recruitment for Study 3 was slower and much more difficult than initially expected. Fatal suicide attempts are a low baseline behavior. Further, it has been estimated that only approximately 25% of fatal suicide attempters actually leave a suicide note (O'Connor, Sheeby, & O'Connor, 1999). Even when a suicide note is left, family members may not have access to the note, as these notes are often apprehended by police as evidence at the time of the suicide, and are not returned to the next of kin in a timely manner. Even if family members do have access to a suicide note, however, they not may be comfortable sharing the personal contents of the note for the purpose of research, a hesitancy which is certainly understandable. When considered together, these circumstances made the recruitment for Study 3 very challenging. This being said, the information that was obtained in Study 3 was rich and very detailed, and provided an informative glimpse into the cognitive and affective functioning of each individual immediately prior to the suicide. As such, future research involving the analysis of suicide notes and accompanying interviews with the next of kin are certainly warranted despite the difficulties associated with this methodology. Subsequent studies utilizing this type of methodology should include a larger more representative sample so that results can be generalized to a broader group of fatal suicide attempters.

CHAPTER 7: DISCUSSION

Theoretical Model

The current dissertation involved the development and examination of a new theory, "The Integrated Cognitive Affective Model of Suicidal Thinking and Behavior". Within this model, suicidal thinking and behavior was conceptualized as a continuum, with an absence of ideation at one end of the continuum, and completions (i.e., fatal suicide attempts) at the other end of the continuum. The SEM results, indicated a close to adequate fit between the model and the data set. Further, the model accounted for 90% of the variance in the data set, and was associated with an acceptable margin of residual error. Consistent with predictions, the SEM results indicated that a combination of rumination and negative affect impacted both cognitive distortions and cognitive deficits. Cognitive distortions then directly impacted the development of suicide ideation. However, cognitive distortions also demonstrated a reciprocal relationship with affect, rumination and cognitive deficits, indicating that once developed cognitive distortions further reinforced these variables. Cognitive deficits, in contrast, demonstrated an indirect impact on the development of suicide ideation, through their reciprocal relationships not only with cognitive distortions, but also affect and rumination.

A more parsimonious "Cognitive Deficits and Distortions Model of Suicidal Thinking" was also assessed and was associated with better fit indices and less residual error than the initial model. These findings would seem to suggest that affect and rumination are not essential components in a model of suicidal thinking. However, as was argued previously, it is possible that the simplified model yielded better fit indices because of issues with the measurement model and the redundancy of affect in the model.

Further, a number of different results from the current dissertation support the importance of including both affect and rumination in a model of suicidal thinking. Consider, for example, the

reported findings from both Study 1 and Study 2 where affect demonstrated significant correlations, not only with cognitive distortions but also with suicide ideation. The regression analyses provide further support for the importance of including affect in a model of suicidal thinking. Negative affect (Study 1) and self-directed anger (Study 2) were both found to significantly increase the prediction of suicide ideation above and beyond hopelessness.

There are also a number of findings in the current dissertation that support the inclusion of rumination in an integrated model of suicidal thinking and behavior. Similar to affect, rumination demonstrated significant correlations with measures of cognitive distortions and with degree of suicide ideation. These robust findings were evident both in Study 1, and the non-student sample in Study 2. Furthermore, in Study 1 rumination significantly increased the prediction of suicide ideation above and beyond hopelessness.

Other findings in the current studies are also relevant to the current discussion. Lyubomirsky and Nolen-Hoeksema (1995), for instance, have reported findings indicating that negative affect only leads to negative thinking and increased hopelessness when combined with a ruminative thinking style. In the current research, the non-ideating groups (in both Study 1 and Study 2) reported that they experienced some degree of negative affect. Although the level of negative affect endorsed by the non-ideator group was significantly less than the ideator group, it is also notable that, compared to the non-ideating group, the ideating group reported significantly higher levels of both rumination and negative appraisals. Further, rumination was significantly correlated with negative affect, hopelessness and negative appraisals indicating that, as rumination increased, negative affect and cognitive distortions also increased. These patterns, initially observed in Study 1, were also found in Study 2. In support of the findings reported by Lyubomirsky and Nolen-Hoeksema (1995), the results of the current studies indicate that hopeless and negative appraisals become most problematic when negative affect is combined with

rumination. In combination, these findings provide some compelling evidence to support the inclusion of both affect and rumination in a model of suicidal thinking and behavior. When considered together, the results of the analyses in Study 1 and Study 2 provide strong support for the hypothesized model.

Theoretical Model: Suicide Ideation and Attempts as a Continuum

In "The Cognitive Affective Model of Suicidal Thinking and Behavior" suicide ideation and attempts were conceptualized as a continuum. The factors that contributed to the development of suicide ideation were also suggested to have important utility for understanding the development of both non-fatal and fatal suicide attempts. Moving across the continuum from ideation to attempt it was predicted that: rumination would persist, negative affect and negative cognitive appraisals would increase, positive affect, and associated positive appraisals would decrease, and more severe cognitive deficits would develop. Concomitant with these changes, evaluations of life were expected to become more negative, whereas appraisals of death were expected to become more positive. Ambivalence was thus expected to decrease, and the individual was expected to become more likely to act on his/her suicidal thoughts. Given the large sample size required for SEM analyses, it was not possible to directly assess the second phase of the full model (development of suicide attempts) in Study 2. However, preliminary analyses were conducted to determine whether the observed between-group differences were consistent with those expected in the model.

In general, the findings from Study 2 were consistent with the expected relationships in the second phase of the model. Compared to ideators, attempters reported significantly higher levels of negative affect and significantly lower levels of positive affect. Consistent with hypotheses, cognitive distortions were also higher in ideators than non-ideators and higher in attempters than ideators. Relative to ideators, attempters reported significantly higher levels of hopelessness and significantly lower levels of positive appraisals of self and future. Consistent with predictions in the

second phase of the model, attempters reported a tendency to ruminate and this level was not significantly different from those reported by ideators. In Study 2, changes in cognitive deficits were also noted, with the attempter group reporting significantly higher levels of problem-solving avoidance and cognitive rigidity than the non-ideator group. Problem-solving, in contrast, did not differ significantly across the continuum.

Further, attempters reported significantly higher levels of suicide ideation than did ideators. As expected, compared to ideators, attempters endorsed appraisals of life that were significantly more negative, and appraisals of death that were significantly more positive. Surprisingly, no significant between-group differences were observed for the ideator and attempter groups in terms of ambivalence. Despite the fact that negative affect and negative appraisals increased significantly, and the fact that positive affect and positive appraisals decreased significantly, reported level of ambivalence was similar for ideator and attempter groups. With the exception of problem-solving and ambivalence, the between-group differences that were observed in Study 2 are consistent with the predicted relationships in the second phase of the model. Given that affect and cognitive appraisals were significantly more negative in the attempter than the ideator group, it is somewhat difficult to explain why ambivalence was not significantly lower in attempters than in ideators.

One possible explanation is the fact that the measure of ambivalence that was utilized in the current studies assesses ambivalence not only in terms affect and appraisals related to self and life, but also in terms of appraisals of thoughts and feelings related to others. It is notable that while appraisals of self, future, and life were significantly lower in attempters than in ideators, this trend was not apparent in terms of appraisals of others. Instead, the positive appraisals of others was very similar for ideator and attempter groups (see Table 11). Further, in the suicide note analysis (Study 3), it was noted that suicide completers appraised others using both positive and

negative statements. Given that the measure of ambivalence (RAIS) utilized in the current study includes evaluations of others, and the observation that individuals in the ideator and attempter (and completer) groups appraised others both positively and negatively, it is perhaps not surprising that ambivalence scores did not differ significantly between ideators and attempters in the current studies. It is possible that the lack of significant between-group differences for ambivalence is more a result of the measure than of actual between-group differences. Consistent with possiibility is the fact that, when compared to ideators, attempters reported significantly lower levels of positive affect and less positive appraisals (of self, life and future) and significantly higher levels of negative affect and more positive appraisals of death. These findings indicate that attempters demonstrate less ambivalence than ideators, at least as it pertains to life and death.

In the proposed model, cognitive deficits were hypothesized to become more problematic as suicide ideation becomes more severe and the individual is at greater risk of acting on these self-destructive thoughts. In part, the results of Study 2 supported this supposition. Both cognitive rigidity and problem-solving avoidance increased across the continuum and were significantly higher in attempters than in non-ideators. However, in Study 2, self-reported problem-solving deficits did not decrease significantly across the continuum.

The lack of significant between-group differences in reported problem-solving skills is more difficult to interpret. Chang (1998) has concluded that problem-solving deficits play an important role in the development of suicide ideation. D'Zurilla, Nezu, and Maydeu-Olivares (2004) and Reinecke (2006) have proposed that suicidal thinking and behavior may be treated using therapeutic approaches that enhance effective problem-solving. However, these recommendations may be somewhat premature. As was previously noted, the results of research investigating the relationship between problem-solving and suicide ideation and behavior have been mixed. Although Schotte and Clum (1987) reported that problem-solving deficits are associated with an

increased risk of suicide ideation and suicide attempts, Yang and Clum (1995) have reported that problem-solving deficits are not related to an increased risk of suicidal thinking or behavior. Considered together, the results of Study 1 and Study 2 do not provide any compelling evidence to suggest that problem-solving deficits play an important role in the development of suicidal thinking and behavior. Rather, the current studies found that reported problem-solving did not differ between non-ideators and ideators, or between ideators and non-fatal attempters.

However, self-reported problem-solving avoidance did increase significantly across these 3 groups. Based on these findings it would seem that even in non-fatal suicide attempters, problem-solving skills may be intact, but these individuals have a tendency to avoid engaging in active problem-solving. On the basis of these findings, it can be concluded that even non-fatal suicide attempters rate their problem-solving skills as adequate. Whether similar findings would have been observed with behavioral rather than self-report measures of problem-solving remains unclear. Evidently, subsequent research utilizing a wider variety of problem-solving measures is required to address the mixed findings in extant suicidology research related to problem-solving deficits.

In summary, the findings from Study 2 indicated that (with the exception of self-reported problem-solving), all other measures including- affect, rumination, cognitive distortions and cognitive deficits- demonstrated significant correlations with both suicide ideation and the level of intent in recent suicide attempters. When considered together, the findings in Study 2 provide some preliminary support for the predicted relationships in the second phase of the proposed model pertaining to the development of suicide attempts. However, in the absence of causal modeling analysis it is not possible to determine, with any degree of certainty, whether the proposed relationships among components in the model are supported as specified. Additional research is required to further assess the integrity of the second phase of the model (i.e., the development of suicide attempts) using causal modeling techniques.

The results of Study 3 provide some preliminary evidence to suggest that affect, rumination, cognitive distortions, and cognitive deficits are evident in a group of fatal suicide attempters as well. Study 3, which was exploratory in nature, involved conducting psychological autopsy interviews with next of kin of fatal suicide attempters, and analyzing the content of suicide notes to determine if there was any evidence of the expected patterns of affect, rumination, cognitive distortions, and cognitive deficits in a group of fatal suicide attempters. Information collected during the psychological autopsy interviews indicated that family members noted increases in negative affect and cognitive distortions, especially hopelessness and negative appraisals, prior to the fatal suicide attempt of their loved one. This information was also corroborated by the suicide note content analysis. Family members also reported that their loved ones demonstrated both rumination and cognitive deficits immediately prior to fatal suicide attempts. Perhaps due to the process-oriented nature of rumination and cognitive deficits, there was less evidence of these variables in the content of the suicide notes. Family members reported that their loved ones appraised life very negatively and death very positively immediately prior to the suicide, and these patterns were clearly evident in the content of the suicide notes. In fact, these "life as negative" and "death as positive" statements were so strong that there was no evidence of ambivalence in the content of the suicide notes, at least as it pertains to life and death.

The information that was obtained in the psychological autopsy interviews and suicide note analysis was very rich and detailed, and provided some preliminary evidence that factors in the proposed model, including affect, rumination, cognitive distortions, and to a lesser degree, cognitive deficits may also have important implications for understanding and explaining fatal suicide attempts. However, given the small sample size, and the fact that Study 3 was exploratory in nature, these preliminary observations will need to be further validated in larger more representative samples of fatal suicide attempters.

Predicting Suicide Ideation

A secondary goal of Study 1 and Study 2 involved investigating whether the components in the proposed model, including cognitive distortions and cognitive deficits, had utility for predicting suicide ideation. Consistent with previous research (Beck et al., 1985; Beck et al., 1990), the regression analysis in Study 1 indicated that hopelessness was a significant predictor of suicide ideation. In addition, the results of Study 1 demonstrated some new findings, as ambivalence, rumination, and negative affect were significant predictors of suicide ideation above and beyond hopelessness. This set of predictors, which include a measure of ambivalence, rumination and negative affect, provide further support for the components of the hypothesized model. Similar findings were observed in Study 2, where it was found that ambivalence and negative affect (self-directed anger) had utility for predicting suicide ideation above and beyond hopelessness.

These findings have some interesting implications. First, these findings have important implications for understanding the phenomenology of suicide ideation. In extant suicidology literature, suicide ideation is typically described as a state that is characterized by negative affect and hopelessness (Boergers et al., 1998; Kumar & Steer, 1996; Topol & Reznikoff, 1982). While the current findings support the idea that suicide ideation is associated with negative affect and negative appraisals (including hopelessness), the findings reported herein also indicated that this negative cognitive-affective state is only one aspect of suicide ideation. That is, the results of the current studies indicated that suicide ideation is characterized by a mixed cognitive-affective state that is also associated with positive affect and positive appraisals. Further, this mixed cognitive-affective state that is characteristic of ideators is associated with ambivalence. Consistent with this observed pattern, the results of the current studies suggest that the prediction of suicide may be enhanced by including not only a measure of hopelessness, but also measures of ambivalence.

Predicting the Severity of Suicide Non-Fatal Suicide Attempts

A secondary goal of Study 2, involved assessing the utility of the components in the model, not only in terms of predicting suicide ideation, but also in predicting the severity of suicide attempts, given the presence of suicide ideation. The results of the regression analysis indicated that hopelessness was the best predictor of the severity of intent in recent suicide attempters. Further, none of the other variables in the model had predictive utility above and beyond hopelessness. Given the differences that were observed between suicide ideators and recent attempters this finding is not surprising. While suicide ideators reported moderate levels of both positive and negative affect, and positive and negative appraisals, recent suicide attempters reported levels of negative affect that were significantly higher than ideators, and levels of positive affect that were significantly lower than ideators. Related to these significant differences in affect, recent attempters also reported appraisals of self, life and future that were significantly more negative than those reported by ideators. Essentially, relative to ideators, recent attempters reported a cognitive-affective state that was primarily negative and this state was most adequately embodied in terms of the individual's level of hopelessness. Consequently, it is not surprising that hopelessness was the only significant predictor of severity of suicide attempts.

Other Findings

Cognitive Distortions and Cognitive Deficits

In the current dissertation, it was suggested that cognitive distortions and cognitive deficits might have utility for understanding and predicting suicidal thinking and behavior. When considering all of the results reported herein, it can be concluded that cognitive distortions are important in suicide ideation. The *Cognitive Distortions* factor demonstrated a reciprocal relationship with all other factors in the proposed model and was the only factor to demonstrate a direct impact on the development of suicide ideation. All cognitive distortion measures were

significantly higher in ideators than in non-ideators. Furthermore, hopelessness, a measure of cognitive distortions, was consistently a significant predictor of suicide ideation.

In contrast, although the *Cognitive Deficits* factor was found to have a reciprocal relationship with all of the factors in the proposed model (including cognitive distortions, affect, and ruminarion) this factor had only an indirect impact on suicide ideation, through its relationship with cognitive distortions, affect and rumination. Further, none of the cognitive deficits measures had any predictive utility above and beyond hopelessness in the prediction of suicide ideation. As predicted, cognitive distortions were more important in the development and prediction of suicide ideation than were cognitive deficits.

However, as predicted, cognitive deficits became more evident further along the suicide continuum, as ideation became more severe and suicide attempts became more likely. In Study 2, two cognitive deficit measures, problem-solving avoidance and cognitive rigidity were significantly higher in attempters than non-ideators. Of these two measures avoidant problem-solving increased the most consistently between groups over the continuum. As it was not possible to directly assess the fit of the second phase of the proposed model (i.e., the development of suicide attempts) in Study 2, it is unclear whether cognitive deficits would have a direct or indirect impact on suicide attempts.

Although it was not possible to assess the integrity of the proposed model in the development of suicide attempts, the relationships between all of the variables were examined. Compared to the cognitive deficit measures, the cognitive distortion measures demonstrated stronger and more consistent linear relationships, not only with the degree of suicide ideation, but also, with the severity of intent in recent suicide attempts. Further, hopelessness, was the single best predictor of the severity of suicide attempts, and none of the cognitive deficit measures

increased the prediction of the severity of intent in suicide attempts above and beyond hopelessness.

In summary, based on the results of Study 1 and Study 2, it can be concluded that cognitive distortions are very important in suicide ideation, and in the prediction of both suicide ideation and the severity of suicide attempts. In contrast, cognitive deficits assume a less central role in suicide ideation.

Given the observed reciprocal relationships between cognitive deficits and the factors in the model, it can be concluded that cognitive deficits impact suicide ideation indirectly, through their impact on negative affect, and cognitive distortions.

The relationship between cognitive distortions and cognitive deficits, and the specific contribution of each in the development of suicide attempts, remains more speculative though. Additional research is required to more definitively assess how cognitive distortions and cognitive deficits interact to impact the development of suicide attempts. In particular, the second phase of the model, the development of suicide attempts will need to be evaluated in a larger sample using causal modeling with a broader range of cognitive deficit measures.

Ambivalence

One important finding in the current research is that ambivalence is an important predictor of suicide ideation. In his "Ten Commonalities of Suicide", Shneidman (1993) suggested that ambivalence is the common psychological state of suicide. In part, the findings of the current studies support this supposition. In both Studies 1 and 2, ambivalence demonstrated predictive utility above and beyond hopelessness in the prediction of suicide ideation. However, although attempters reported a moderate level of ambivalence (Study 2), ambivalence did not increase the prediction of the severity of intent in suicide attempts above and beyond hopelessness. Further, in the information that was collected during the psychological autopsies and the suicide note analysis

(Study 3), there was a marked absence of ambivalence relating to self, life, and death. The individuals, who had made fatal suicide attempts described themselves, their lives and their future in a very negative manner, while describing death in a very positive manner. The only ambivalence that was noted was in terms of how the fatal suicide attempters referred to others in their suicide notes. That is, suicide completers spoke of others in both positive and negative terms. Thus, the results of the current research support the supposition that suicide ideation is characterized by ambivalence, but the current studies provide no compelling evidence to suggest that ambivalence is associated with fatal suicide attempts. In fact, the preliminary findings of Study 3 would suggest that fatal suicide attempts are associated with an absence of ambivalence, at least as it is related to self and personal future. As the current findings have demonstrated that ambivalence is important in understanding and predicting suicide ideation, the paucity of research investigating the relationship between ambivalence and suicidology will need to be further addressed.

Perceptual Constriction

Shneidman (1993) suggested that the psychological state immediately preceding suicide is one that is characterized by "tunnel vision". In his "Ten Commonalities of Suicide", Shneidman (1993) proposed that the common perceptual state in suicide is constriction. There are a number of findings and observations in the current studies that are relevant to this proposition. While perceptual constriction was not assessed directly in the current studies, a related construct, cognitive rigidity, was assessed in Studies 1 and 2. Cognitive rigidity increased along the suicide continuum, with significant differences noted between non-ideators and attempters. In the current studies, cognitive rigidity became more problematic as suicide ideation and the risk of suicide attempts became more severe. However, when the cognitive and affective processes of fatal suicide attempters were examined in Study 3, the findings were mixed.

If fatal suicide attempts are associated with perceptual constriction, it would be expected that the content of suicide notes would be characterized by a very narrow perceptual field, lacking both depth and breadth. In examining the content of the suicide notes in Study 3, it became clear that the degree of perceptual constriction exhibited by the individual varied, depending on whether the individual was considering his/her own situation and future, or that of others. When writing about the future in general, individuals spoke of the future of their friends and family, often speculating on future events, and even how they believed the suicide would impact those loved ones that they were leaving behind. These descriptions in the suicide notes suggested empathy for the feelings of others and, as such, indicated that perception was not egocentric immediately prior to the suicide. Considering the evidence of future-oriented thinking in the suicide notes, it is also apparent that future perception was not restricted immediately prior to the suicide. The individuals in the current study who died by suicide, spoke clearly of the future, but in their discussions, they described a future that did not include them.

These discrepant findings are somewhat difficult to reconcile. For those individuals in Study 3 who made fatal suicide attempts, there was a notable dichotomy related to thinking and perception. When considering themselves, their own life and their personal future, the thinking of these fatal suicide attempters was very negative and rigidly fixed. In contrast, when thinking about others and the future of others, the thinking of these fatal suicide attempters was more positive and less rigid. Clearly, additional research is required to further investigate how perceptual constriction might impact suicidal thinking and behavior.

Limitations and Future Directions

There are a number of limitations associated with the current studies. Many of these limitations have already been discussed in earlier discussion sections and will not be repeated here. One notable concern in Study 1 was the use of an undergraduate sample. While this sample

was chosen due to practical constraints, the use of this sample precludes the generalization of the results to a broader population. Study 2, which included a wider community/clinical sample, was conducted to address this sampling limitation. However, the sample in Study 2 was not large enough to utilize SEM to examine the integrity of the full model in the community sample. Consequently, the proposed "Integrated Cognitive Affective Model of Suicidal Thinking and Behavior" will need to be assessed in its entirety in a larger more representative sample. While this limitation is noted, it is also true that the between-group differences and the relationships between variables in the student sample in Study 1 closely paralleled the findings in the community sample in Study 2.

A primary concern with Study 2 was also related to sample characteristics. Although the sample in Study 2 included a wider range of participants from community and clinical populations, certain groups were under-represented in the sample. For instance, although a diagnosis of schizophrenia is known to be associated with an increased risk of suicidal thinking and behavior (American Association of Suicidology, 2002), there was only one individual in the current sample who had been diagnosed with schizophrenia. Another sample-related limitation of the current research was the age range of the samples. In the current study, children, adolescents, and older adults were excluded due to the potential confounding of age-related development differences in these cohorts. As suicidal thinking and behavior occurs across the entire life span, subsequent research will also need to be conducted in both younger and older age groups to determine whether the proposed model has utility for understanding suicidal thinking and behavior across the entire lifespan. In general, the findings reported herein, will need to be replicated in larger more representative samples so that findings can be generalized across a wider population, both in terms of a broader age spectrum and a wider range of psychopathology.

An additional limitation of Study 2 was methodological in nature. Within the proposed model, suicidal thinking and behavior were conceptualized on a continuum. Given the practical constraints of the current research, a cross sectional design was utilized. While there is some preliminary between-group evidence in the current studies to support the predicted changes across the continuum, subsequent research is required to investigate whether these predicted changes occur in the same individuals over time. Ideally, researchers could identify a sample of individuals who have a history of suicidal thinking and/or behavior and, utilizing a longitudinal research design could follow these individuals over time, to determine if the predicted changes are evident moving across the continuum.

A further methodological difficulty involved the use of certain measures in the current studies. The most notable difficulties involved the cognitive deficits measures. The Social Problem-Solving Inventory [SPSI] was utilized in the current studies as it is commonly used in suicidology research, and is reportedly a good predictor of suicide ideation (Fitzpatrick, Witte, Schmidt, 2005). However, in the current studies the SPSI did not correlate well with suicide ideation or with the other cognitive deficit measure (i.e., the EFT]. Perhaps these low correlations can be explained in terms of the format of the measures, as the SPSI is a self-report measure, whereas the EFT is behavior measure. In Study 2, cognitive deficits did not have as strong a relationship with suicide attempts as expected. It is difficult to know whether this relationship would have been stronger if behavior measures rather than self-report measures had been used in the current studies.

Although the Embedded Figures Test [EFT] is a behavioral measure, it was also problematic as this measure demonstrated a ceiling effect with very little between-group variation. Thus, it is possible that cognitive rigidity may have demonstrated greater predictive utility in the current studies if a different measure had been chosen. Future suicidology research is required to further investigate this issue using a broader range of behavioral cognitive deficit measures.

Study 3 involved conducting psychological autopsies and analyzing the content of suicide notes to determine whether the components in the model were evident in a sample of fatal suicide attempters. The sample for study 3, which included 4 fatal suicide attempters, was too small to be adequately representative. As such, subsequent research is required to replicate the reported findings in a larger sample of fatal suicide attempters. While this limitation is noted, the non-representative nature of the sample was not considered to be especially problematic, as Study 3 was designed to be exploratory in nature.

Implications

The current findings have some important implications. First, the findings reported herein enhance the current theoretical understanding of the phenomenology of suicidal thinking and behavior. In addition, the current findings have relevance for the ongoing development of the risk assessment related to suicide ideation and suicide attempts. Bryan and Rudd (2006) have stressed the importance of developing a more accurate assessment protocol for suicide risk. On the basis of the current findings, it is recommended that measures of ambivalence, rumination, and negative affect be added to indicators of hopelessness to enhance the prediction of suicide ideation.

The current findings also have important implications for identifying ideators who are at increased risk of attempting suicide, as the results of the current studies indicate that increasing suicide ideation and increased risk of suicide attempts is related to an increasingly negative cognitive-affective state, which is embodied by hopelessness. Consistent with previous research (Beck et al., 1982), hopelessness demonstrated superior utility in the prediction of severity of intent related to recent suicide attempts. As such, the current findings support the continued use of measures of hopelessness in the prediction of the severe suicide attempts. Given that the other variables in the current studies, did not add predictive utility above and beyond hopelessness, in terms of the severity of suicide attempts, indices of hopelessness would seem to be the measure of

choice when conducting brief time-limited risk assessments compared to the other factors in the model.

However, when conducting more comprehensive ongoing risk assessments, tracking changes in positive and negative affect and appraisals of self, life and future may also enhance the clinical understanding of increasing risk of suicidal behavior. In the current studies, it was also noted that, compared to ideators, recent suicide attempters rated life more negatively and death more positively, and this pattern was strongly correlated with increasing suicide ideation. As such, briefly evaluating the individual's appraisal of life and death, may also inform clinical estimation of suicide risk. While levels of affect and cognitive appraisals did not enhance the statistical prediction of the severity of suicide attempts above and beyond hopelessness, they may still be clinically useful for developing a deeper understanding of the underlying processes and changes related to increased risk of suicidal behavior.

The results of the current research have important clinical implications not only for assessment but also for treatment. The findings reported herein indicate that higher levels of suicide ideation are related to an increased risk of suicidal behavior. It is also notable that all individuals in the current studies who attempted suicide were experiencing suicide ideation at the time of the attempt. In Study 3, the suicide notes contained evidence that this suicide ideation was present for some time, in several cases for many years prior to the fatal suicide attempt. This finding supports the importance of assessing and treating suicide ideation, especially ideation that is not transient or time-limited. The literature, often emphasizes the importance of conducting suicide risk assessment (Gliatto, & Rai, 1999). The focus is typically on determining the imminent risk of suicidal behavior so that crisis intervention can occur if necessary. Clearly this type of assessment and intervention is critical for prevention of fatal suicide attempts. Less has been currently written though about a specific protocol for treating suicide ideation that is not considered

to be related to imminent risk. Given the current findings it could be argued that any degree of persistent suicide ideation should be addressed in treatment with the goal of preventing increasing levels of suicide ideation and the associated increasing risk of suicide attempts.

The results of the current research also have implications for designing treatment for individuals who are currently ideating and at risk of suicidal behavior. For example, given its relationship to suicide ideation and suicide attempts, rumination should be targeted in treatment. In the current studies, increasing ideation was related to increasingly negative affect and negative cognitive appraisals. It was also noted in the current studies that positive affect and related positive appraisals were inversely related to increasing severity of suicide ideation. Considered together, these findings suggest that targeting and minimizing negative affect and negative thinking, while simultaneously increasing positive affect and positive appraisals, should be an important component of treatment for individuals who are at risk of suicidal behavior.

The current findings also have implications for understanding factors and processes that are protective, thereby minimizing the risk of suicidal thinking and behavior. In particular, the results of the current studies indicated that positive affect, especially when combined with positive appraisals of self, life, and future were negatively correlated with increasing risk of suicide ideation and the severity of intent in recent suicide attempters. Suicide ideators, who reported negative affect and associated negative appraisals, differed from suicide attempters in that the former group also reported moderate levels of positive affect and appraisals, whereas attempters did not. This differential pattern suggests that positive affect and appraisals may protect the individual from acting on negative thoughts and feelings.

In research that has investigated subjective well-being, researchers have found that positive, optimistic attitudes are significantly correlated with indices of health and satisfaction with life (Diener, & Seligman, 2002; Evans, 1994; King, Hicks, Krull, & Del Gaiso, 2006). The current

research indicates that positive hopeful attitudes are also related to a decreased risk of suicide ideation and suicide attempts, and that these positive attitudes are related to positive affect. Folkman and Moskowitz (2000) have suggested that researchers have a tendency to focus on risk factors at the expense of protective factors related to health and well-being. While a comprehensive understanding of risk and vulnerability are clearly important, there is also a need to better understand protective factors in the interest of preventing negative outcomes. With relevance to suicidology research, positive affect and positive attitudes certainly warrant further investigation in this respect.

Contributions

The current research makes a number of important contributions to the suicidology research. Some of these contributions are theoretical in nature. The proposed "Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior" moves beyond predicting suicidal thinking and behavior in terms of isolated risk factors. Instead, in this new model, suicidal thinking and behavior is discussed in terms of vulnerabilities, including affect, rumination, cognitive distortions, and cognitive deficits. This new model was not designed to be all-encompassing, but rather, was developed to integrate many basic psychological factors and processes that are known to be associated with suicidal thinking and behavior. With few exceptions, the proposed model is supported by the current research, and is consistent with extant research findings in the suicidology litrerature. The proposed model is an improvement over many previous models in that it allows for the differentiation among non-ideators, ideators, and attempters. The current research also provides support for the conceptualization of suicidal thinking and behavior on a continuum, and indicates that non-ideators, ideators, non-fatal attempters and fatal attempters differ in terms of affect, cognitive distortions, and cognitive deficits. Further, the model provides a preliminary understanding of how these factors interact and impact suicide ideation and sucide attempts.

The current research also contributes to understanding the differences between suicide ideators and attempters. Of particular significance was the finding that suicide ideation is characterized by a mixed cognitive-affective state that is associated not only with negative, but also with positive affect and appraisals.

The current dissertation also has important clinical implications. Most notably, the results of the current dissertation contribute new information about the prediction of suicide ideation. Furthermore, the current findings have utility for potentially improving the assessment and treatment of individuals who are at risk of suicide ideation and behavior.

Concluding Remarks

Throughout the completion of the current dissertation, it became readily apparent that researching suicidology is certainly not without its challenges. These challenges include a lack of well defined theories of suicidal thinking and behavior, major gaps in the suicidology literature, difficulties recruiting representative samples, and a lack of well-validated measures for certain constructs (such as ambivalence) that are important for suicidology research.

In completing this research, however, and interviewing not only individuals who were at risk of suicidal behavior, but also individuals who had lost a loved one to suicide, the importance of this research was also readily apparent. Despite the numerous challenges related to investigating the factors that contribute to suicidal thinking and behavior, ongoing suicidology research is imperative. Such research is critical, not only to enhance the understanding of suicide but also, to improve prevention and intervention strategies for vulnerable individuals, who are at risk of suicidal behavior. The current dissertation represents a step in this ongoing process.

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Appendix A:
Summary of Risk Factors That Differentiate Between Non-Ideating Controls, Suicide Ideation, Suicide Attempts, and Suicide Completion.

RISK FACTORS	NON-IDEATING CONTROL [N]	SUICIDE IDEATION [I]	SUICIDE ATTEMPTS [A]	SUICIDE COMPLETION [C]
PERSONALITY				
External Locus of Control		> N (1)	> N (2)	
Neuroticism		> N (3)	> N (4)	
Introversion		> N (5)	> N (6)	
Perfectionism		> N (7)	> N (8)	
Low Self-Esteem		> N (9)	> N (10)	
Impulsivity		---	---	
Pessimism *		> N (11)	> I (12)	> A (12)
AFFECT				
Range of Affect		< N (13)	< N (13)	
Intensity of Affect		> N (13)	> N (13)	
Self-Directed Anger *		> N (14)	> I (15)	
Guilt		> N (16)		
Positive Affect		---	---	
COGNTION				
Attentional Bias (Death/Suicide)			> N (17)	
General vs. Specific (Autobiographical memory)		> N (18)		
Retrieval Latency (positive memories)		> N (19)		
Difficulties concentrating		> N (20)		
Negative Appraisals		> N (21)		
Hopelessness *		> N (22)	> I (23)	> A (24)
Cognitive Rigidity		> N (25)		
Dichotomous Thinking		> N (26)		
Problem-Solving Deficits		> N (27)		
Ruminative Thinking Style		> N (28)		

Note: > N = greater than Non-Ideating Control group;
> I = greater than Suicide Ideation group
> A = greater than (nonfatal) Suicide Attempters

(1; Sidrrow & Lester, 1973), (2; Levenson, 1973), (3; Colson, 1972), (4; White, 1974), (5; Lester, 1987), (6; Roy., 1998), (7; Hewtiit et al., 1994), (8; Hewtiit et al., 1998), (9; deMan, 1988), (10; Wetzel, 1996), (11; Kinkel et al., 1989), (12; Beck et al., 1985), (13; Horesh et al., 1997), (14; Simonds et al., 1991), (15; Goldney et al., 1997), (16; VanGastel et al., 1997), (17; Becker et al., 1996), (18; Evans et al., 1992), (19; Williams & Broasbent, 1986a), (20; Mendonca & Holden, 1996), (21; Ovuga & Mugisha, 1990), (22; Hewitt et al., 1998), (23; Topol & Reznikoff, 1982), (24; Kumar & Steer, 1996), (25; Upmanyu et al., 1996), (26; Litinsky & Haslam, 1999), (27; Schotte & Clum, 1987) (28; Ahrens & Linden,1996).

Appendix B:

DEMOGRAPHIC INFORMATION SHEET

Please answer the following questions

1. Sex: 1. Male _____
   2. Female _____

2. Age: _____

3. Marital Status:
   1. Single _____
   2. Married _____
   3. Common law _____
   4. Separated _____
   5. Divorced _____
   6. Widowed _____

4. Number of Children _____

5a. Last grade completed in public and/or high school _____

b. Have you completed:
   some university/ college _____
   community college diploma _____
   undergraduate university degree _____
   graduate university degree _____

6. Current Occupation: _____

7. Ethnicity _____

8. Religious Affiliation (if any): _____

Appendix C:

GENERAL ATTITUDES SCALE

For the following questions, please indicate how you rate your attitude about the following items ***over the past two weeks***. Please circle only one number for each item, using the following scale:

1 = extremely negative.
2 = somewhat negative.
3 = slightly negative.
4 = slightly negative and slightly positive.
5 = slightly positive.
6 = somewhat positive.
7 = extremely positive.

Yourself	1	2	3	4	5	6	7
Others (in general)	1	2	3	4	5	6	7
Your Future	1	2	3	4	5	6	7
Life	1	2	3	4	5	6	7
Death	1	2	3	4	5	6	7

Appendix D:

The PANAS Affect Scale-Revised

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to the word. **Indicate to what extent you have generally felt this way over the past four weeks**. Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

____	interested	____	irritable
____	distressed	____	alert
____	excited	____	ashamed
____	upset	____	inspired
____	strong	____	nervous
____	guilty	____	determined
____	scared	____	attentive
____	hostile	____	jittery
____	enthusiastic	____	active
____	proud	____	afraid
____	joyful	____	hopeful
____	sad	____	despondent
____	desperate	____	elated
____	content	____	patient
____	frustrated	____	calm
____	angry (at self)	____	angry (at others)

Appendix E:
Study 1: Information Sheet and Informed Consent

Research Title: The Investigation of an Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior

Investigators: Laura Fazakas-DeHoog, M.A. (Doctoral candidate, Clinical Psychology)
Dr. David Dozois (Ph.D., C. Psych).

A large body of research has been devoted to understanding suicidal thinking and behavior. This research assists mental health professionals in accurately predicting and preventing suicide. We are conducting the present study to further our understanding of how mood and thinking processes contribute to the development of suicidal thinking and behavior. We would greatly appreciate it if you would consider participating in our study.

If you decide to participate in this study, you will be asked to complete of a number of questionnaires that ask about problem-solving skills, and recent positive and negative thoughts and feelings. You will also be asked to complete a short task that assesses thinking processes. Participation in the study will require approximately an hour of your time. Prior to completing the questionnaires, you will receive one research credit. Your participation would also involve returning for a follow-up session in approximately three months. At this time, you would be asked to complete a package of questionnaires assessing your recent mood, and thoughts and beliefs. Participation in the second session of the study would require approximately another hour of your time. Prior to completing the questionnaires, you will receive one additional research credit. At the end of the study, you will be given written feedback and will be given the opportunity to have any questions answered at that time.

Participation in the study is entirely voluntary. You may refuse to participate or withdraw from the study at any time, for any reason without penalty, or loss of my research credit. All information that you provide will be used only for research purposes, and will be kept confidential. Given the nature of the current study, there is one possible limit to confidentiality. In the event that any participant is at risk of imminent suicidal behavior, the investigator may seek additional assessment and supports for that participant. In this event, it may be necessary to break confidentiality. However, prior to sharing any of the information with health care professionals, the investigator will seek the informed consent of the participant. There are no known physical or psychological risks associated with participation in this study.

Any publications that result from this study will include only group results, and will never include any personal or identifying information. All completed documents and questionnaires will be stored in a locked office, and only the primary investigator and research assistants will have access to the information. Seven years after the completion of the study, all documents and questionnaires will be destroyed.

I have read and understood all of the above information, and agree to participate in the study.

_____	_____	_____
Participant's name (please print)	Signature	Date

Please provide your London telephone number and email address so that your 3-month follow-up appointment can be confirmed.

Telephone Number _____ Email _____

Appendix F:
Study 1: Feedback sheet

Research Title: The Investigation of an Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior

Investigators: Laura Fazakas-DeHoog, M.A. (Doctoral candidate, Clinical Psychology)
Dr. David Dozois (Ph.D., C. Psych)

FEEDBACK SHEET

Although many research studies have looked at the factors that contribute to suicidal thinking and behavior, our understanding of suicide is still somewhat limited. Researchers have found that individuals who think about suicide often experience more negative feelings and have more negative thoughts about themselves and their future than individuals who don't think about suicide. Less is currently known though, about why some individuals act on these suicidal thoughts and attempt suicide, while others do not.

One possibility is that individuals who attempt suicide have a tendency to ruminate, or think about their negative feelings and problems repeatedly. When combined with intense negative feelings, and problem-solving deficits, rumination may cause feelings and thinking to become even more negative, until the individual is unable to find any alternative solutions to their problems, and ultimately decide to attempt suicide. The current study was designed to investigate this possibility.

The questionnaires that you were asked to complete during the study assessed your recent thoughts and feelings, both positive and negative. Certain questionnaires that you completed during the study, including the General Attitudes Scale, and Hopelessness Scale were used to assess your positive and negative thoughts about yourself, others, and your future. The PANAS scale and ECQ were used to assess your current mood, and your ability to control your emotions. It is expected that individuals who are not currently having suicidal thoughts will be more positive in both their thoughts and their feelings, and will have greater control over their feelings.

Other questionnaires that you completed during the study, including the Response Style Questionnaire, the GRS scale, and the Worry Questionnaire were used to determine whether you have a tendency to ruminate or worry about your problems. The Problem-Solving Inventory was used to assess your problem-solving skills. It is expected that individuals who are currently having suicidal thoughts will be more likely to ruminate about their problems, and will be less effective in solving their problems.

The current study may increase researchers' knowledge about suicidal thinking and behavior. A greater understanding of suicide is important because it allows researchers to develop ways of predicting suicide and assisting those who are at risk. Your participation in this study may have allowed us to move a step closer to reaching this goal. We appreciate your help, and we hope that you have enjoyed participating in this study. There is a list resources below that may be of interest to you. If you have any questions, please call.

Selected References:

Clark, D. C., & Fawcett, J. (1992). Review of Empirical risk factors in for evaluation of the suicidal patient. In B. Bongar (Ed.), *Suicide: Guidelines for assessment, management, and treatment.* (pp. 16-48). New York: Oxford University Press.

Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem-solving. *Journal of Personality and Social Psychology, 69*, 176-190.

Shneidman, E. S. (1997). The suicidal mind. In R. W. Maris, M. M. Silverman, & S. S. Canetto. *Review of suicidology* (pp. 22-41). New York: The Guilford Press.

Upmanyu, V. V., Narula, V., & Moein, L. (1996).A study of suicide ideation: The intervening role of cognitive rigidity. *Psychological Studies, 40*, 126-131.

Appendix G:

COMMUNITY SERVICES AVAILABLE TO STUDENTS

Students can access psychological or psychiatric services both on campus and in the city of London, Ontario in a number of ways. Students who are feeling anxious, depressed, and/or suicidal, and feel that they would benefit from individual assistance, may contact any of the following counseling services:

1. **STUDENT DEVELOPMENT CENTRE** (SDC-University of Western Ontario)
   - Students can make an appointment either by telephone at **661-3031**, or in person at the **Reception Desk, Room 235 within SDC, UCC (Room 210).**
   - Offers students individual appointments to deal with a variety of issues, including anxiety, depression, trauma, sexual or physical assault, date rape, and issues related to sexual orientation.
   - Additional information about Psychological Services offered through SDC may be found on the World wide web at http://www.sdc.uwo.ca/

2. **STUDENT HEALTH SERVICES CENTRE** (SHS-University of Western Ontario)
   - Students can make an appointment either by telephone at **661-3771**, or in person at the **Student Health Services (Room 11, lower level within UCC).**
   - Offers students appointments for individual counseling services.
   - Hours of operation: Monday to Friday (8:30 a.m. to 4:30 p.m.). Please note that the Counseling Centre is closed whenever the university is closed).

3. **LONDON & DISTRICT DISTRESS CENTRE**
   - This is a 24-hour distress line: **(519) 667-6711**
   - Every call is anonymous and confidential.
   - Access by email: londondistresscentre@odyssey.on.ca

4. **CANADIAN MENTAL HEALTH ASSOCIATION**
   - Hours of operation: Monday to Friday (8:30 a.m. to 4:30 p.m.). **(519) 434-9191**
   - Offers referrals to a number of self-help support groups and/or referrals to psychological services within the London-Middlesex area.

Appendix H:
Study 2: Newspaper Advertisement for Recruiting Participants

UNDERSTANDING SUICIDE

Every year thousands of Canadians take their own lives. These deaths are a tragic and untimely loss of life. In an attempt to better understand and ultimately prevent suicide, researchers at the University of Western Ontario are currently seeking volunteers to participate in a study. Participation would involve filling out several questionnaires about recent moods, thoughts, and beliefs, and would require about two hours of your time. Whether you are currently feeling suicidal, or have never considered suicide, we are interested in hearing from you. If you would like to participate in the study, please contact the research team of Dr. Dozois and Laura Fazakas-DeHoog at the University of Western Ontario

- by phone, where you may leave a confidential voice message at , or by email

Appendix I:
Study 2: REQUEST FOR PATIENT REFERRAL TO SUICIDE STUDY

I am currently recruiting participants for a study entitled "The Empirical Investigation of an Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior". This study constitutes an important component of my Ph.D. dissertation at the University of Western Ontario.

I am currently recruiting participants (between the ages of 16 and 65) who qualify for one of the two following categories:

1. Patients who have attempted suicide within the past thirty days.
2. Patients who are currently experiencing suicide ideation.

Participation in the study involves a clinical diagnostic interview to determine eligibility for the current study, as well as the completion of a number of paper and pencil questionnaires. Participation in the study will require approximately two to three hours.

For those participants who are inpatients, I will arrange to meet the patient onsite. For those participants who are outpatients in London, an appointment will be arranged in my office at the university campus. For outpatients in the St. Thomas area, an appointment will be arranged onsite at the hospital.

I will be personally conducting all interviews and collecting all necessary data for the study. As I have completed all of my clinical training at the doctoral level in Clinical psychology, I have extensive experience in assessment, crisis intervention, and working with vulnerable patient populations.

If during participation in the study, it becomes apparent that a patient is at risk of potentially life-threatening behavior, the referring clinician/treatment team will be notified immediately. These notification procedures are outlined in the informed consent that all patients are asked to read and sign prior to participation in the study.

The study has been approved both the University of Western Ontario Ethics review board (#9723E) as well as the RMHC ethics committee.

I can be reached either by phone or by email.

I appreciate your support and assistance with my research,

Laura Fazakas-DeHoog, M.A.
Ph.D. Candidate
Department of Psychology
University of Western Ontario

Appendix J:
Study 2: Participant Information Sheet

LETTER OF INFORMATION **(Version G)**

Research Title: The Empirical Investigation of an Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior

Investigators: Laura Fazakas-DeHoog, M.A. (Doctoral candidate, Clinical Psychology), Department of Psychology; University of Western Ontario.
Dr. David Dozois (Ph.D., C. Psych). Department of Psychology; University of Western Ontario

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You are being invited to participate in a research study looking at factors that predict suicidal thinking and behavior. The purpose of this letter is to provide you with the information that you need to make an informed decision about participating in this study. Please take the time to carefully read this letter before making a decision.

A large body of research has been devoted to understanding suicidal thinking and behavior. This research assists mental health professionals in accurately predicting and preventing suicide. We are conducting the present study to further our understanding of how mood and thinking processes contribute to the development of suicidal thinking and behavior. We would greatly appreciate it if you would consider participating in our study. At least 300 adults in London area are being invited to participate in the current study.

If you agree to participate you will take part in a structured diagnostic interview, for the purpose of determining your eligibility for the current study. This interview will require approximately one hour of your time. Your participation will also involve the completion of a number of questionnaires that ask about problem-solving skills, and recent positive and negative thoughts and feelings. You will also be asked to complete a short task that assesses thinking processes. Completing these questionnaires will require approximately a second hour of your time. If you are currently receiving inpatient care, with your consent, both the interview and the questionnaires will be completed during your stay at the hospital in a private office or interview room. All other interviews will be conducted at the University of Western Ontario. An appointment will be scheduled at your convenience. In appreciation for your assistance with the study, you will be given $20.00.Participation in the study is entirely voluntary. You may refuse to participate, refuse to answer any question, or withdraw from the study at any time, with no effect on your future care. There are no known risks involved in participating in this study.

We will strive to ensure the confidentiality of your research-related records. Absolute confidentiality cannot be guaranteed as we may be required to disclose certain information under some laws. Your letter of consent and some of the information that you provide will be included in your medical record if you are presently an inpatient. In the event you are at risk of imminent suicidal behavior, the investigator may seek additional assessment and supports for you. In this event, it may be necessary to break confidentiality. However, prior to sharing any of the information with health care professionals, the investigator will seek your informed consent.

Your privacy will be respected. Any publications that result from this study will include only group results, and will never include any personal or identifying information. All completed documents and questionnaires will be stored in a locked office, and only the primary investigator and research assistants will have access to the information. Five years after the publication of the study, all documents and questionnaires pertaining to your participation will be destroyed. You may ask questions at any time, and may request a copy of the results upon completion of the research project.

Your signature on the consent form indicates that you have read the information regarding the research project, have had all of your questions answered, and agree to participate in the study with Dr. D. Dozois of the Department of psychology at the University of Western Ontario. In no way does this waive your legal rights, nor release the investigators, sponsors, or institution from their professional responsibilities. If you have any questions about the conduct of this study, or your rights as a research participant, you may contact Dr. J. Gilbert, VP Research and Development at London Health sciences Centre at 685-8500 ext. 77649. If you have further questions regarding participation in this research, please contact Dr. David Dozois by telephone or by email.

A copy of this consent form will be given to you to keep for your records. Thank you for your participation.

Appendix K:
Study 2: Informed Consent Sheet

INFORMED CONSENT SHEET

Research Title: The Empirical Investigation of an Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior

Investigators: Laura Fazakas-DeHoog, M.A. (Doctoral candidate, Clinical Psychology), Department of Psychology; University of Western Ontario
Dr. David Dozois (Ph.D., C. Psych). Department of Psychology; University of Western Ontario

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I have read the Letter of Information, have had the nature of the study explained to me, and agree to participate in the study. All of my questions have been answered to my satisfaction.

Participant's name (please print)	Signature	Date
Name of person obtaining Informed Consent (please print)	Signature of person obtaining Informed Consent	Date

Appendix L:
Study 2: Feedback Sheet

Research Title: The Empirical Investigation of an Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior

Investigators: Dr. David Dozois (Ph.D., C. Psych)
Laura Fazakas-DeHoog, M.A. (Doctoral candidate, Clinical Psychology)

FEEDBACK SHEET

Although many research studies have looked at the factors that contribute to suicidal thinking and behavior, our understanding of suicide is still somewhat limited. Researchers have found that individuals who think about suicide often experience more negative feelings and have more negative thoughts about themselves and their future than individuals who don't think about suicide. Less is currently known though, about why some individuals act on these suicidal thoughts and attempt suicide, while others do not.

One possibility is that individuals who attempt suicide have a tendency to ruminate, or think about their negative feelings and problems repeatedly. When combined with intense negative feelings, and problem-solving deficits, rumination may cause feelings and thinking to become even more negative, until the individual is unable to find any alternative solutions to their problems, and ultimately decide to attempt suicide. The current study was designed to investigate this possibility.

The questionnaires that you were asked to complete during the study assessed your recent thoughts and feelings both positive and negative. Certain questionnaires that you completed during the study, including the General Attitudes Scale and Hopelessness Scale were used to assess your positive and negative thoughts about yourself, others, and your future. The PANAS scale and ECQ were used to assess your current mood, and your ability to control your emotions. It is expected that individuals who are not currently having suicidal thoughts will be more positive in both their thoughts and their feelings, and will have greater control over their feelings.

Other questionnaires that you completed during the study, including the Response Style Questionnaire, the GRS scale, and the Worry Questionnaire were used to determine whether you have a tendency to ruminate or worry about your problems. The Problem-Solving Inventory was used to assess your problem-solving skills. It is expected that individuals who are currently having suicidal thoughts will be more likely to ruminate about their problems, and will be less effective in solving their problems.

The current study may increase researchers' knowledge about suicidal thinking and behavior. A greater understanding of suicide is important because it allows researchers to develop ways of predicting suicide and assisting those who are at risk. Your participation in this study may have allowed us to move a step closer to reaching this goal. We appreciate your help, and we hope that you have enjoyed participating in this study. There is a list resources below that may be of interest to you. If you have any questions, please call Dr. Dozois.

Selected References:

Clark, D. C., & Fawcett, J. (1992). Review of Empirical risk factors in for evaluation of the suicidal patient. In B. Bongar (Ed.), *Suicide: Guidelines for assessment, management, and treatment.* (pp. 16-48). New York: Oxford University Press.

Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem-solving. *Journal of Personality and Social Psychology, 69*, 176-190.

Shneidman, E. S. (1997). The suicidal mind. In R. W. Maris, M. M. Silverman, & S. S. Canetto. *Review of suicidology* (pp. 22-41). New York: The Guilford Press.

Self Help References:

Burns, D. D. (1999). Feeling good: The new mood therapy. New York: Avon, Inc.

Greenberger, D. & Padesky, C. Mind over mood: Change the way you feel by changing the way you think. New York: Guilford Press.

Appendix M:
Study 2 and Study 3: Community Resources Information Sheet

COUNSELING/SUPPORT SERVICES & COMMUNITY RESOURCES

Individuals can access psychological or psychiatric services in the city of London, Ontario in a number of ways. Individuals who are feeling anxious, depressed, and/or suicidal, and feel that they would benefit from individual assistance, may contact any of the following counseling services:

5. **LONDON & DISTRICT DISTRESS CENTRE**
   - This is a 24-hour distress line: **(519) 667-6711**
   - Every call is anonymous and confidential.
   - Access by email: londondistresscentre@odyssey.on.ca

6. **URGENT CONSULTATION SERVICES**
   - London Health Sciences Centre (LHSC- South Street) at (519) 685-8500.
   - Offers urgent psychological/psychiatry assessment and referrals.
   - May be accessed either through the emergency room London Health Sciences Centre (LHSC- South Street) or by physician referral.

7. **SUICIDE BEREAVEMENT SUPPORT SERVICES**
   - Includes both a Peer Support group which meets at the Canadian Mental Health Association [(519) 434-9191; 648 Huron St, London, Ontario] the **second Tuesday of every month from 7:00 to 9:00 p.m.**
   - And an 8-week Healing After Suicide Therapy Group offered in the spring and fall through the Canadian Mental Health Association **(519) 434-9191).**

8. **LONDON INTERFAITH COUNSELING CENTRE**
   - 141 Dundas St. London. To make an appointment call **434-0077.**
   - Offers a variety of counseling services.

9. **CANADIAN MENTAL HEALTH ASSOCIATION**
   - Hours of operation: Monday to Friday (8:30 a.m. to 4:30 p.m.). **(519) 434-9191**
   - Offers referrals to a number of self-help support groups and/or referrals to psychological/counseling services within the London-Middlesex area.

Appendix N:
Study 3: Structured Survivor of Suicide Interview [SSOSI]

STRUCTURED SURVIVOR OF SUICIDE INTERVIEW

Date of Interview: _____ Number: _____

INTERVIEWEE

Name : _____

Address: _____

_____

_____

Phone : _____

Relationship to deceased: _____

Last spoke to individual: _____

DEMOGRAPHIC INFORMATION

Name: _____

Date of Birth: _____ Date of suicide: _____

Age: ____ Gender: _____ Marital Status: _____

Date: (If separated/divorced) _____

Number of Children: _____

Education: _____

Occupation: _____

Ethnicity:_____

Religious Affiliation (if any):_____

HISTORY OF SUICIDAL BEHAVIOR

Method of suicide _____

_____

Location (potential for intervention) _____

_____

_____

_____

Precautions taken (to avoid intervention) _____

_____

_____

_____

Detection _____

_____

_____

Previous Attempts: Did he/she ever attempt suicide previously ?

Date: _____ Method: _____ Intervention: _____
Date: _____ Method: _____ Intervention: _____
Date: _____ Method: _____ Intervention: _____

Suicide Threats: To the best of your knowledge did he/she ever previously threaten suicide ? _____

_____

_____

_____

Suicide Ideation: To the best of your knowledge did he/she think about suicide ?

_____

_____

_____

If so, how often? _____

_____

_____

Can you tell about his/her physical health? _____

_____

_____

Chronic Illness _____

_____

_____

Terminal Illness _____

_____

_____

Prescription Drug History _____

_____

_____

_____

Drinking Habits _____

_____

_____

Alcohol use immediately prior to suicide? _____

Treatment for alcohol abuse? _____

_____

Non-prescription drug use _____

Non-prescription drug use immediately prior to the suicide? _____

PSYCHIATRIC HISTORY

1. Current psychiatric disorder? (If so, what was the diagnosis?) _____

Recent psychotherapy/counseling? _____

Hospitalization _____

Medication history _____

ECT Treatment _____

II. <u>Past Psychiatric History</u>

History of the disorder(s) _____

Hospitalization history _____

Medication history _____

Additional Comments: _____

PSYCHOLOGICAL FUNCTIONING

TYPICALLY

I. Please indicate the degree to which your loved one demonstrated the following qualities, where:

1 = not at all and 7 = very much

Perfectionism	1	2	3	4	5	6	7
High Self-esteem	1	2	3	4	5	6	7
Conscientiousness	1	2	3	4	5	6	7
Guilt	1	2	3	4	5	6	7
Optimism	1	2	3	4	5	6	7
Impulsiveness	1	2	3	4	5	6	7

ONE MONTH PRIOR TO SUICIDE

I. Please indicate the degree to which your loved one demonstrated the following qualities, where:

1 = not at all and 7 = very much

Perfectionism	1	2	3	4	5	6	7
High Self-esteem	1	2	3	4	5	6	7
Conscientiousness	1	2	3	4	5	6	7
Guilt	1	2	3	4	5	6	7
Optimism	1	2	3	4	5	6	7
Impulsiveness	1	2	3	4	5	6	7

RUMINATION

I. Please indicate the degree to which your loved one engaged in rumination where:

1 = not at all and 7 = always

TYPICALLY	**Rumination**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
MONTH PRIOR	**Rumination**	**1**	**2**	**3**	**4**	**5**	**6**	**7**

COGNITIVE DEFICITS

TYPICALLY

II. Please rate your loved one's abilities in the following areas, where:

	1 = very poor			and			7 = excellent
Problem-Solving	1	2	3	4	5	6	7
Decision-Making	1	2	3	4	5	6	7
Attention	1	2	3	4	5	6	7
Memory	1	2	3	4	5	6	7

ONE MONTH PRIOR TO SUICIDE

II. Please rate your loved one's abilities in the following areas, where:

	1 = very poor			and			7 = excellent
Problem-Solving	1	2	3	4	5	6	7
Decision-Making	1	2	3	4	5	6	7
Attention	1	2	3	4	5	6	7
Memory	1	2	3	4	5	6	7

COGNITIVE DISTORTIONS

TYPICALLY

III. Please indicate the degree to which your loved one exhibited the following, where:

	1 = not at all			**and**			**7 = completely**
Hope	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Coping Skills	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Distorted Thinking (dichotomous)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Distorted Thinking (overgeneralize)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Distorted Thinking (catastophizing))	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Bizarre Beliefs/Delusions	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Hallucinations	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Problem-Solving Skills	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Communication Skills	**1**	**2**	**3**	**4**	**5**	**6**	**7**

ONE MONTH PRIOR TO SUICIDE

III. Please indicate the degree, to which your loved one exhibited the following, where:

	1 = not at all			and			7 = completely
Hope	1	2	3	4	5	6	7
Coping Skills	1	2	3	4	5	6	7
Distorted Thinking (dichotomous)	1	2	3	4	5	6	7
Distorted Thinking (overgeneralize)	1	2	3	4	5	6	7
Distorted Thinking (catastophizing))	1	2	3	4	5	6	7
Bizarre Beliefs/Delusions	1	2	3	4	5	6	7
Hallucinations	1	2	3	4	5	6	7
Problem-Solving Skills	1	2	3	4	5	6	7
Communication Skills	1	2	3	4	5	6	7

TYPICALLY

IV. Please indicate the degree, to which your loved one felt positive about the following, where:

	1 = very negative			and			7 = very positive
Self	1	2	3	4	5	6	7
Others	1	2	3	4	5	6	7
Future	1	2	3	4	5	6	7
Life	1	2	3	4	5	6	7
Death	1	2	3	4	5	6	7
Ability to Cope	1	2	3	4	5	6	7

ONE MONTH PRIOR TO SUICIDE

IV. Please indicate the degree to which your loved one felt positive about the following, where:

	1 = very negative				**and**		**7 = very positive**
Self	1	2	3	4	5	6	7
Others	1	2	3	4	5	6	7
Future	1	2	3	4	5	6	7
Life	1	2	3	4	5	6	7
Death	1	2	3	4	5	6	7
Ability to Cope	1	2	3	4	5	6	7

AFFECT

I. Please indicate the degree to which your loved one experienced a full range of emotions, where:

1 = none (affect blunted or absent) and 7 = full/normal range of emotion

TYPICALLY	**Range of Affect**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
MONTH PRIOR	**Range of Affect**	**1**	**2**	**3**	**4**	**5**	**6**	**7**

II. Please indicate the degree to which your loved one was emotionally stable, where:

		1 = not at all				**and**	**7 = completely**	
TYPICALLY	**Affective Lability**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
MONTH PRIOR	**Affective Lability**	**1**	**2**	**3**	**4**	**5**	**6**	**7**

III. Please indicate the degree to which your loved one was able to express emotions, where:

TYPICALLY	**Emotional Expression (negative affect)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
MONTH PRIOR	**Emotional Expression (negative affect)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
TYPICALLY	**Emotional Expression (positive affect)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
MONTH PRIOR	**Emotional Expression (negative affect)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**

IV. To the best of your knowledge, were there any emotions that your loved had difficulties expressing ?_____

_____

_____

TYPICALLY

The Revised [NOK] PANAS Affect Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to the word. **Indicate to what extend your loved one generally felt this way, that is, how he/she felt on average**. Use the following scale to record your answers.

	1 very slightly or not at all	2 a little	3 moderately	4 quite a bit	5 extremely
Interested	1	2	3	4	5
Distressed	1	2	3	4	5
Excited	1	2	3	4	5
Upset	1	2	3	4	5
Strong	1	2	3	4	5
Guilty	1	2	3	4	5
Scared	1	2	3	4	5
Hostile	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Irritable	1	2	3	4	5
Alert	1	2	3	4	5
Ashamed	1	2	3	4	5
Inspired	1	2	3	4	5
Nervous	1	2	3	4	5
Determined	1	2	3	4	5
Attentive	1	2	3	4	5
Jittery	1	2	3	4	5
Active	1	2	3	4	5
Afraid	1	2	3	4	5
Anger (at self)	1	2	3	4	5
Anger (at others)	1	2	3	4	5

MONTH PRIOR

The Revised [NOK] PANAS Affect Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to the word. **Indicate to what extend your loved one generally felt this way, that is, how he/she felt on average**. Use the following scale to record your answers.

	1 very slightly or not at all	2 a little	3 moderately	4 quite a bit	5 extremely
Interested	1	2	3	4	5
Distressed	1	2	3	4	5
Excited	1	2	3	4	5
Upset	1	2	3	4	5
Strong	1	2	3	4	5
Guilty	1	2	3	4	5
Scared	1	2	3	4	5
Hostile	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Irritable	1	2	3	4	5
Alert	1	2	3	4	5
Ashamed	1	2	3	4	5
Inspired	1	2	3	4	5
Nervous	1	2	3	4	5
Determined	1	2	3	4	5
Attentive	1	2	3	4	5
Jittery	1	2	3	4	5
Active	1	2	3	4	5
Afraid	1	2	3	4	5
Anger (at self)	1	2	3	4	5
Anger (at others)	1	2	3	4	5

Other comments about emotional functioning:

SOCIAL

I. Relationships

Please indicate the degree to which your loved one felt that he/she felt that relationships were important, where:

1 = not at all and 7 = very much

Importance of Relationships	1	2	3	4	5	6	7
Integration into Social System	1	2	3	4	5	6	7
Social Alienation (aloneness)	1	2	3	4	5	6	7
Expression of Loneliness	1	2	3	4	5	6	7

II. Support

i). Please indicate the degree to which your loved one would have indicated that he/she had the following types of support available, where:

1 = not at all and 7 = very much

Practical Support	1	2	3	4	5	6	7
Emotional Support	1	2	3	4	5	6	7
Validational Support	1	2	3	4	5	6	7

ii). Please indicate the degree to which you felt that your loved one had access to the following types of support, where:

1 = not at all and 7 = very much

Practical Support	1	2	3	4	5	6	7
Emotional Support	1	2	3	4	5	6	7
Validational Support	1	2	3	4	5	6	7

N.B. *practical support* = offering help or assistance, loaning money, babysitting, etc.
validational support = offering understanding of feelings, thoughts, & experiences.
emotional support = offering comfort, compassion, kindness, caring, nurturance, etc.

RECENT STRESSORS/LIFE EVENTS

I. What kind of chronic stressors was your loved one dealing with ?

Yes ___ NO ___ Unemployment

Yes ___ NO ___ Losses

Yes ___ NO ___ Relationship issues

Yes ___ NO ___ Past traumas

Yes ___ NO ___ Other

II. To the best of your knowledge did your loved one recently experience any acute stressors immediately prior to the suicide?

III. To the best of your knowledge did your loved one experience any trigger or critical event immediately prior to the suicide ?

BEHAVIOR

I. Did your loved one engage in any aggressive or violent behavior prior to the suicide ?

Towards others _____

Self-Directed _____

History of Self-Injurious behavior ? _____

II. Did your loved one engage in any unusual (leave-taking) behavior prior to the suicide?

Writing of a last will & testament	yes _____	no _____
Giving away possessions	yes _____	no _____
Resolving interpersonal conflicts	yes _____	no _____
Canceling future engagements	yes _____	no _____
Saying good-bye	yes _____	no _____

ADDITIONAL INFORMATION

i. Other comments/information: _____

Appendix O:
Study 3: Participant information Sheet

LETTER OF INFORMATION **VERSION-S**

Research Title: The Empirical Investigation of an Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior

Investigators: Laura Fazakas-DeHoog, M.A. (Doctoral candidate, Clinical Psychology), Department of Psychology: University of Western Ontario
Dr. David Dozois (Ph.D., C. Psych). Department of Psychology; University of Western Ontario

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You are being invited to participate in a research study looking at factors that predict suicidal thinking and behavior. The purpose of this letter is to provide you with the information that you need to make an informed decision about participating in this study. Please take the time to carefully read this letter before making a decision.

A large body of research has been devoted to understanding suicidal thinking and behavior. This research assists mental health professionals in accurately predicting and preventing suicide. We are conducting the present study to further our understanding of how mood and thinking processes contribute to the development of suicidal thinking and behavior. We would greatly appreciate it if you would consider participating in our study. In the London area, approximately 50 individuals, who have lost a loved one to suicide, are being invited to participate in the current study.

Your participation in the current study will involve a structured interview, for the purpose of gathering information about your loved one's health history, and thoughts and feelings prior to the suicide. This interview, which will require approximately two hours of your time, will take place in a private office at the University of Western Ontario. With your permission, a copy of your loved one's suicide note (if available) may also be requested. The purpose of requesting a copy of the suicide note is to analyze the contents of the suicide note to provide information about your loved one's thoughts and feelings prior to the suicide. All identifying information will be removed from the suicide notes to protect your identity and the identity of your loved one.

Participation in the study is entirely voluntary. You may refuse to participate, refuse to answer any question, or withdraw from the study at any time. There are no known risks involved in participating in this study. In appreciation for your assistance with the study, you will be given $20.00.

We will strive to ensure the confidentiality of your research-related records. Absolute confidentiality cannot be guaranteed as we may be required to disclose certain information under some laws. In particular, laws require health care providers to report knowledge of child abuse or neglect to appropriate officials. In the event you are at risk of imminent suicidal behavior, the investigator may seek additional assessment and supports for you. In this event, it may be necessary to break confidentiality. However, prior to sharing any of the information with health care professionals, the investigator will seek your informed consent.

Your privacy will be respected. Any publications that result from this study will include only group results, and will never include any personal or identifying information. In addition, suicide notes will never be published in their entirety, without your express permission. All completed documents and questionnaires will be stored in a locked office, and only the primary investigator and research assistants will have access to the information. Five years after the publication of the study, all documents and questionnaires pertaining to your participation will be destroyed.

Your signature on the consent form indicates that you have read the information regarding the research project, have had all of your questions answered, and agree to participate in the study with Dr. D. Dozois of the Department of psychology at the University of Western Ontario. In no way does this waive your legal rights, nor release the investigators, sponsors, or institution form their professional responsibilities. If you have any questions about the conduct of this study, or your rights as a research participant, you may contact Dr. J. Gilbert, VP Research and Development at London Health sciences Centre at 685-8500 ext. 77649. If you have further questions regarding participation in this research, please contact Dr. David Dozois.

Appendix P:
Study 3: Participant Informed Consent Sheet

PARCTICIPANT INFORMED CONSENT SHEET

Research Title: The Empirical Investigation of an Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior

Investigators: Laura Fazakas-DeHoog, M.A. (Doctoral candidate, Clinical Psychology), Department of Psychology: University of Western Ontario
Dr. David Dozois (Ph.D., C. Psych). Department of Psychology; University of Western Ontario

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I have read the Letter of Information, have had the nature of the study explained to me, and agree to participate in the study. All of my questions have been answered to my satisfaction.

Participant's name (please print)	Signature	Date
Name of person obtaining Informed Consent (please print)	Signature of person obtaining Informed Consent	Date

Appendix Q:
Study 3: Participant Feedback Sheet

Research Title: The Empirical Investigation of an Integrated Cognitive-Affective Model of Suicidal Thinking and Behavior

Investigators: Dr. David Dozois (Ph.D., C. Psych)
Laura Fazakas-DeHoog, M.A. (Doctoral candidate, Clinical Psychology)

FEEDBACK SHEET

Although many research studies have looked at the factors that contribute to suicidal thinking and behavior, our understanding of suicide is still somewhat limited. Researchers have found that individuals who think about suicide often experience more negative feelings and have more negative thoughts about themselves and their future than individuals who don't think about suicide. Less is currently known though, about why some individuals act on these suicidal thoughts and attempt suicide, while others do not.

One possibility is that individuals who attempt suicide have a tendency to ruminate, or think about their negative feelings and problems repeatedly. When combined with intense negative feelings, and problem-solving deficits, rumination may cause feelings and thinking to become even more negative, until the individual is unable to find any alternative solutions to their problems, and ultimately decide to attempt suicide. The current study was designed to investigate this possibility.

The questions that you were asked to during the interview will be used to assess the thoughts and feelings, both positive and negative, of your loved one prior to the suicide. In addition, the contents of the suicide note that you provided will be studied to identify any patterns of thoughts, feelings, or behaviors that may be useful for understanding and predicting suicidal thinking and behavior.

The current study may increase researchers' knowledge about suicidal thinking and behavior. A greater understanding of suicide is important because it allows researchers to develop ways of predicting suicide and assisting those who are at risk. Your participation in this study may have allowed us to move a step closer to reaching this goal.

We appreciate your help, and we hope that you have enjoyed participating in this study. There is a list resources below that may be of interest to you. If you have any questions, please call Dr. Dozois at (661-2111, ext. 84678).

Selected References:

Clark, D. C., & Fawcett, J. (1992). Review of Empirical risk factors in for evaluation of the suicidal patient. In B. Bongar (Ed.), *Suicide: Guidelines for assessment, management, and treatment.* (pp. 16-48). New York: Oxford University Press.

Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem-solving. *Journal of Personality and Social Psychology, 69*, 176-190.

Shneidman, E. S. (1997). The suicidal mind. In R. W. Maris, M. M. Silverman, & S. S. Canetto. *Review of suicidology* (pp. 22-41). New York: The Guilford Press.

Upmanyu, V. V., Narula, V., & Moein, L. (1996).A study of suicide ideation: The intervening role of Cognitive rigidity. *Psychological Studies, 40*, 126-131.

Appendix R:

Office of Research Ethics

The University of Western Ontario
Room 00045 Dental Sciences Building, London, ON, Canada N6A 5C1
Telephone: (519) 661-3036 Fax: (519) 850-2466 Email: ethics@uwo.ca
Website: www.uwo.ca/research/ethics

Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Dr. D.J.A. Dozois

Review Number: 09723E **Revision Number: 3**

Protocol Title: The Empirical Investigation of an Integrated Cognitive-affective Model of Suicidal Thinking and Behaviour

Department and Institution: Psychology, University of Western Ontario

Sponsor:

Ethics Approval Date: May 24, 2006 **Expiry Date:** June 30, 2007

Documents Reviewed and Approved: Revised End Date, Advertisement

Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted expedited approval to the above named research study on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

This approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the HSREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.

Investigators must promptly also report to the HSREB:

a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;

b) all adverse and unexpected experiences or events that are both serious and unexpected;

c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

Chair of HSREB: Dr. John W. McDonald

Deputy Chair: Susan Hoddinott

Ethics Officer to Contact for Further Information		
✓ Ethics Officer (ethics@uwo.ca)	☐ Janice Sutherland (jsuther@uwo.ca)	☐ Jennifer McEwen (jmcewen4@uwo.ca)

This is an official document. Please retain the original in your files.

cc: ORE File
LHRI
Faxed: Y / N