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Dichotomous thinking and its relation to suicidal ideation and the perception of stress.

Kevin R. Smith

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Lichotomous Thinking and its Relation to Suicidal Ideation and the Perception of Stress

Kevin R. Smith

B.A., Bishop's University, 1990

A Thesis Submitted to the Faculty of Graduate Studies through the Department of Psychology in Partial Fulfilment of the Requirements for the Degree of Master of Arts at the University of Windsor Windsor, Ontario, Canada 1993
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Abstract

The present study was undertaken to look at the effect of dichotomous thinking and irrational beliefs on the perception of stress and subsequent suicidal ideation. 236 college students were given measures involving distorted cognitions, two different measures of stress, depression, hopelessness, and suicidal ideation. It was expected that distorted cognitions would be related to extreme ratings of stress. Therefore, this would provide a possible explanation for the interaction of distorted cognitions and stress and how this could lead to suicidal ideation in some individuals. It was also hypothesized that dichotomous thinking and irrational beliefs would show some correlation and support the construct validity of the Rational Behaviors Inventory as a measure of dichotomous thinking. In addition, it was desired to compare major life events versus hassles in accounting for suicidal ideation. Multiple regression analyses revealed that hopelessness, depression, and extreme negative thinking accounted for the most variance in suicidal ideation scores. Results are discussed suggesting that positive and negative extreme thinking contribute at different stages in the suicidal process.
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CHAPTER I
INTRODUCTION

Suicide is a complex phenomenon that can be approached from many different perspectives. Suicide is not a singular static event, but a dynamic and temporal phenomenon which progresses from ideation to attempt to completion (Beck & Weisharr, 1990). Suicidal ideators and attempters share similar characteristics. For example, both groups are characterized by similar patterns of depression in a factor analysis of their scores on the Beck Depression Inventory (Beck & Lester, 1977). This suggests that although ideators and attempters may be at different stages with respect to the suicidal process, there are common variables between them (Beck and Lester, 1977). Furthermore, this indicates that studying suicide early in the process may help prevent it from developing into an attempt.

It is important that individuals at risk for suicide be identified. To this end, many demographic variables have been explored as possible indicators, such as sex and age, among others. Another approach has been to look at various psychological indicators of vulnerability to suicide including depression (e.g., Beck & Lester, 1977), hopelessness (e.g., Kovacs, Beck & Weismann, 1975), cognition (e.g., Levenson & Neuringer, 1971) and life stress (e.g., Bonner & Rich, 1988a). It has been suggested that the identification of particular psychological variables can
improve the assessment of suicide risk and identify those areas of distress that may be targets of treatment for suicidal individuals (Ellis & Ratliff, 1986).

One of the most robust findings in the suicide literature is the importance of hopelessness. Hopelessness has been found to be one of the most predictive variables in accounting for suicidal ideation. This is especially true in individuals who have made suicide attempts (Beck, Weissman, Lester & Trexler, 1974; Kovacs, Beck & Weissman, 1975; Beck & Weisharr, 1990), whereas depression is thought to be more salient at the debut of suicidal ideation (Bonner & Rich, 1987).

Various cognitive variables have been explored in an attempt to discern their relationship to suicidal ideation. Most of these have focused on cognitive constriction or rigidity. It has been hypothesized that this type of thinking style predisposes an individual to thinking about and/or attempting suicide.

Dichotomous Thinking

One of the first studies to look at cognition and suicide was a study done by Neuringer (1961). The results suggested that suicidal individuals tend to think in 'dichotomous' terms. Neuringer utilized Osgood's (1957) Semantic Differential Method. The subjects in this study rated eighteen bipolar concepts such as life and death, and God and the devil, on a seven point Likert scale. Each
concept was rated on nine different scales anchored by opposite evaluations such as good-bad and beautiful-ugly. It was found that hospitalized individuals who had made a suicide attempt had a greater tendency to rate these concepts more extremely than a group of non-psychiatric hospitalized individuals. In addition, suicidal ideators also rated opposing paired concepts as being more extreme in comparison to each other. For example, if love and hate were rated, the distance between the ratings of love and hate would be greater on average for suicidal ideators.

However, the measure of dichotomous thinking did not distinguish suicidal ideators from other hospitalized psychiatric inpatients. In addition, Neuringer failed to separate the dichotomous thinking into positive and negative extreme ratings. Subsequent research has determined that many different scales factor into positive and negative affective components, which may affect the interpretation of obtained results (Gotlib & Meyer, 1986; Watson & Tellegen, 1985). Nevertheless, this type of approach to measuring dichotomous thinking was a unique approach in assessing all-or-none thinking and has not been followed up.

Deficient Problem-Solving

Since then, different approaches to measuring cognitive distortions have emerged over time. Levenson & Neuringer (1971) found suicidal patients to be less effective problem-solvers on the WAIS-R arithmetic subtest and the Rokeach Map
Test. The Rokeach Map Test measures an individual's ability to change a mental set in order to find the shortest route between two points on a map. Patsiokas, Clum & Luscomb (1979) compared 49 suicide attempters with 48 non-suicidal psychiatric patients and found the suicidal patients to be more cognitively rigid, based on the use of the Alternate Uses Test. The Alternate Uses Test is composed of six items dealing with ordinary household objects and the individual has to come up with as many different uses as he/she can in a limited amount of time. It is hypothesized to be a measure of cognitive flexibility. Schotte & Clum (1987) also found that the Alternate Uses Test distinguished suicidal from non-suicidal psychiatric inpatients.

Perrah and Wichman (1987) examined suicide attempters twelve months after a suicide attempt and compared them with normal control subjects on the Alternate Uses Test and the Rokeach Map Test. No differences were found between the two groups. However, the authors did not make any comment on whether the individuals had received any type of therapy since their suicide attempt.

Petrie, Chamberlain & Clarke (1988) investigated 67 suicide attempters on a measure of flexibility and found that it did not distinguish between repeat attempters and those who did not repeat within six months. However, the study had no control group to compare flexibility scores and the authors used a measure (the CPI flexibility scale) not
used by many researchers in the area of suicide research. As a result this study is difficult to compare with findings from other authors.

Bartfai, Winborg, Nordstrom and Asberg (1990) compared male suicidal patients, chronic pain patients and healthy controls on several tests of cognition to measure the constructs of fluency (verbal and non-verbal), flexibility and problem-solving ability. Fluency was described by the authors as the spontaneity and initiative of an individual. Verbal fluency was measured by asking the subjects to enumerate as many words as they could think of that began with a certain letter in three minutes. Non-verbal fluency was measured by asking the subjects to draw as many designs in three minutes as possible. Significant differences were found only on the tests of fluency. Problem-solving deficiencies and cognitive rigidity were not found to characterize the suicidal individuals. However, the groups were found to have significant differences on a measure of intelligence. As a result, this difference was a serious confound of the study. In addition, the study suffered from a very low number of subjects (all groups were composed of less than ten individuals).

**Interpersonal Problem-Solving**

Increasingly, researchers have been concerned that impersonal problem-solving skills were not the most relevant measures for cognitive rigidity. Impersonal problems such
as finding uses for household objects and listing as many
words beginning with a certain letter did not appear to have
much ecological validity. In other words, suicidal
individuals were not likely to be faced with these types of
problems to solve in their everyday life. It was
hypothesized that measures of interpersonal problem-solving
skills would be more appropriate to assess the problems
faced by individuals in their daily life (Arffa, 1983).

Gotlib and Asarnow (1979) used the Means-Ends Problem-
Solving test as a measure of interpersonal problem-solving.
This test involves presenting subjects with ten problematic
interpersonal situations and asking the subject to come up
with possible solutions to solve them. The authors also
included an anagram task as an impersonal measure of
problem-solving ability. Both measures were used to predict
variance on the Beck Depression Inventory among depressed
and non-depressed non-referred students and depressed and
non-depressed students who had sought counselling at the
university counselling service. The Means-End Problem-
Solving test was not significantly correlated with either
intelligence (vocabulary) or the anagram task. However, the
depressed subjects in both groups of students were found to
generate fewer relevant means to solve the problematic
interpersonal situations. In addition, depressed subjects
responded with a greater number of irrelevant means or
failed to provide an answer on the MEPS. In other words,
interpersonal problem-solving skills among depressed subjects were less efficient than non-depressed individuals. They came up with fewer good solutions and more ineffective solutions to the interpersonal situations.

Similarly, Schotte & Clum (1987) also administered the Means-End Problem-Solving procedure and found that suicidal patients gave fewer solutions and more possible negative consequences to the solutions they proposed. They were also less likely to implement the solutions they generated and gave more irrelevant means than a group of non-suicidal psychiatric inpatients. Schotte, Cools, & Payvar (1990) divided the MEPS into two parts. They gave half the test to a group of parasuicidal inpatients shortly after admission to the hospital and the second half seven to eight days later. Measures of depression, anxiety, hopelessness, and suicidal ideation were also administered at both times. Scores on all measures, including the MEPS, improved, demonstrating a strong relation to level of suicidal ideation.

Linehan, Camper, Chiles, Strosahl, & Shearin (1987) compared suicidal ideators, suicide attempters and non-suicidal psychiatric inpatients on the MEPS and found that suicide attempters scored lower on the active problem-solving dimension than ideators. Orbach, Bar-Joseph, & Dror (1990) found the opposite result. Specifically, suicide ideators scored lower than suicide attempters and non-
suicidal psychiatric patients on active problem-solving. The authors hypothesized that this protected them from making a suicide attempt. However, the measure they used was not the MEPS, but a problem-solving task consisting of three dilemmas. As a result, the two studies are not directly comparable.

Problem-Solving Self-Efficacy

Another dimension of problem-solving that has been investigated is self-efficacy. Self-efficacy is the subjective sense of one's ability to solve different types of problems, regardless of actual problem-solving ability. Bonner & Rich (1988a) utilized the Problem Solving Inventory (PSI) to measure this construct. The Problem-Solving Inventory requests that individuals self-appraise their ability to solve interpersonal problems. In other words, the focus is on an individual's subjective or self-appraised rating of their own ability to solve problems and not on an objective measure of their ability to solve problems. In addition, they used the Life Experiences Survey, a measure of life stress and the Zung Self-rating Depression Scale to predict scores on the Hopelessness Scale. In an hierarchical multiple regression, depression was found to account for 42 percent of the variance, self-appraised problem-solving ability was found to account for an additional two percent and the interaction of self-appraised
problem-solving ability and stress an additional six percent.

Dixon, Heppner & Anderson (1991) reported the results of two studies using hierarchical multiple regression. In the first study, self-appraised problem-solving ability was found to account for 1.4 percent of the variance on the Scale for Suicidal Ideation. In the second study, using a different sample of college students, it was found that self-appraised problem-solving ability accounted for 15.2 percent of the variance in hopelessness scores. Therefore, self-appraised problem-solving ability was more predictive of hopelessness than it was of suicidal ideation. This suggests that self-efficacy in problem-solving may be more important in the early stages of suicidal ideation.

**Irrational Beliefs**

The operationalization of cognitive rigidity has also been tapped by assessing irrational beliefs. Irrational beliefs consist of distorted appraisals of one's environment. Often, individuals with irrational beliefs insist that events, other people or oneself should or must be a certain way. According to Rational Emotive Theory, an insistence that things must be a certain lead to many different types of distress, including depression (Walen, DiGiuseppe, & Wessler, 1980).

Prezant & Neimeyer (1988) administered the Cognitive Errors Questionnaire and the Attributional Style
Questionnaire to adults being treated for depression. The selective abstraction and overgeneralization subscales of the Cognitive Errors Questionnaire and the positive stability subscale of the Attributional Style Questionnaire significantly predicted suicidal ideation as measured by the Scale for Suicidal Ideation. Ellis & Ratliff (1986) compared suicidal and non-suicidal psychiatric inpatients on the Dysfunctional Attitudes Scale and the Irrational Beliefs Test. Suicidal patients scored significantly higher than the non-suicidal patients on both measures.

Another instrument that has been used frequently to assess irrational thinking is the Rational Behaviours Inventory (RBI; Shorkey & Whiteman, 1977). This test is based upon the principles of Rational Emotive Therapy. Rational Emotive Therapy looks at many aspects of distorted cognition. One type of thinking that is theorized to contribute to irrational beliefs is dichotomous thinking (Walen, DiGiuseppe, & Wessler, 1980). Dichotomous thinking is demonstrated by the individual's extreme appraisals of events. Unfortunate events are 'awful' or 'terrible' and thus evaluated in a dichotomous fashion. The RBI has been found to contribute significantly in the prediction of suicidal ideation (e.g., Bonner & Rich, 1987; Rich & Bonner, 1987).
Multivariate Models of Suicidal Ideation

Univariate models of predicting suicidal ideation have been consolidated into more complex models. Bonner and Rich (1987) combined several measures and performed a factor analysis resulting in four factors predictive of suicidal ideation. These factors included social/emotional alienation (consisting of loneliness, depression, low perceived problem-solving ability and hopelessness), cognitive distortions (irrational beliefs and rigidity), deficient adaptive resources (few reasons for living, low social support) and stress. Social/emotional alienation was found to be the factor that was most predictive of suicidal ideation.

In a follow-up study, Rich & Bonner (1987) found that depression, few reasons for living, loneliness, and life stress accounted for thirty percent of the variance in current suicidal ideation scores. Additionally, they found that current suicidal ideation, hopelessness, few reasons for living and irrational beliefs best accounted for scores on perceived future suicidal behaviour.

In a third study, Bonner & Rich (1988b) assessed vulnerability at time one to predict suicidal ideation scores six weeks later at time two. Vulnerability at time one was assessed by the Zung Self-rating Depression scale, the UCLA Loneliness Scale, the Rational Behaviors Inventory and the Reasons for Living inventory. At time two, the same
vulnerability measures of life stress and suicidal ideation were administered, as well as a midterm stress scale constructed by the authors. Results indicated that vulnerability at time one predicted twenty-five percent of variance in suicidal ideation scores at time two. Irrational cognitions were found to load with social/emotional alienation instead of loading separately on a factor of cognitive distortions as they had done in a previous study.

Schotte & Clum (1982) proposed a similar model stipulating that cognitive deficits would interact with high levels of life stress and lead to hopelessness and suicidal ideation. The authors tested this model on college students and assessed depression, hopelessness, impersonal cognitive rigidity, interpersonal cognitive rigidity, life stress, and current suicidal ideation. Depression, hopelessness, and life stress were found to best discriminate ideators from non-ideators. Orthogonal contrasts indicated that poor problem-solvers under high stress had significantly higher suicidal intent than good problem-solvers under low stress, good problem-solvers under high stress, and poor problem-solvers under low stress. A multiple regression analysis demonstrated that depression and hopelessness were the best predictors of suicide ideation, accounting for forty-four percent of the variance.
In general, both models posit that stress exacerbates psychological vulnerability leading to hopelessness and suicidal ideation. One of the most frequent components of psychological vulnerability in these studies is depression. Depression has frequently been found to account for a large proportion of the variance in suicidal ideation scores. In fact, most models have included measures of depression and hopelessness to predict suicidal ideation and have usually been found to account for the most variance compared to other variables studied.

The Measurement of Stress

A frequently used measure of stress in these studies is the Life Experiences Survey (Sarason, Johnson and Siegel, 1978). This measure has individuals rate significant events that occurred in their life on a seven point Likert scale ranging from -3 to +3. Note the similarity to the assessment of dichotomous thinking in the study by Neuringer.

Therefore, the use of the LES may be subject to a response bias on the part of individuals who think in dichotomous terms. Recall that individuals that gave extreme scale ratings versus milder or more moderate ratings of concepts such as God and the Devil were operationally defined as dichotomous thinkers or cognitively rigid. As a result, it may be that these individuals give higher ratings of stress due to this tendency to view things in dichotomous
terms and therefore provide a basis for the high correlation between cognitive rigidity and stress.

Another measure utilized to assess stress is called the Daily Hassles and Uplifts Scales (Kanner, Coyne, Schaefer and Lazarus, 1981). This measure was compared with a test similar to the Life Experiences Survey and found to better predict general psychological distress as measured by the Hopkins Symptom Checklist. These measures differ in that one focuses on major life events (Life Experiences Survey) as a source of stress and the other focuses on the irritations and joys of daily living (Daily Hassles and Uplifts Scale). As the Life Experiences Survey measures both positive and negative life stress, the hassles are the negative aspects of daily living and the uplifts are the positive aspects. The latter scale has never been used to predict suicidal ideation. As a result, it is not clear whether sporadic major life events or frequent minor hassles would be more important in the development of suicidal ideation.

Hypotheses

It is hypothesized that individuals who score higher on dichotomous thinking on Neuringer's Semantic Differential will demonstrate a tendency to rate their life events on the Life Experience Survey and their hassles and uplifts more extremely than those who show less dichotomous thinking. Specifically, it is expected that individuals scoring high
on dichotomous thinking will demonstrate a higher tendency to rate their experience of stress as +3 or -3 than individuals scoring low on dichotomous thinking. It was also predicted that negative extreme thinking on Neuringer’s Semantic Differential would be more predictive of negative stress and suicidal ideation than positive extreme thinking.

It is also hypothesized that the relation between irrational thinking, using the Rational Behaviors Inventory, will be similar to that predicted for dichotomous thinking. Specifically, that there will be a relation between higher levels of irrational beliefs and more extreme ratings of stress.

It is hoped that by studying rigidity in this way, that a link will be established between the dichotomous thinking demonstrated by Neuringer and the dichotomous thinking tapped by Rational Emotive Theory. It was expected that if a relation between the Rational Behaviors Inventory and the Semantic Differential Method is found, that this would provide evidence of construct validation for the Rational Behaviors Inventory. Specifically, that the Rational Behaviors Inventory is a valid measure of dichotomous thinking.

In addition, this study attempted to specify the process that occurs when cognitive distortion and stress interact. Specifically, it is not that individuals have more instances of stress occurring in their life, but that
any stress experienced by a cognitively rigid individual will be evaluated more extremely than individuals low in cognitive rigidity. This evaluation of stress as being more extreme should then also be more predictive of suicidal ideation.

In addition, it was predicted that the Daily Hassles & Uplifts scale would account for more variance than the Life Experiences Survey in accounting for variance in suicidal ideation.

Finally, measures of hopelessness and depression were utilized to assess the relative contribution of dichotomous thinking, irrational thinking, major life events, and hassles and uplifts in the prediction of suicidal ideation. Specifically, it was desired to investigate whether any of these variables could significantly account for variance in suicidal ideation over and above depression and hopelessness.
CHAPTER II

METHOD

Subjects

236 students from Introductory Psychology and two second year classes were recruited for the study. 63 males and 172 females participated in the study. The age of the participants ranged from 18 to 56 years of age and the mean age was equal to 24. The students were given experimental credit in return for their participation.

Measures

Neuringer (1961) used a Semantic Differential Method (Osgood, 1957) as his measure of dichotomous thinking. This study used the same concepts and scales developed by Neuringer. Eighteen concepts were evaluated on nine different seven-point scales anchored by opposing adjectives. The 18 concepts included: democracy, communism, life, death, murder, suicide, mother, father, honour, shame, success, failure, God, devil, love, hate, myself, and other people. Each of these concepts was selected by Neuringer to elicit a strong affective evaluation. All concepts were rated on the following nine scales: good-bad, dirty-clean, nice-awful, unpleasant-pleasant, fair-unfair, worthless-
valuable, happy-sad, dishonest-honest, and beautiful-ugly. The nine scales are in Likert format with seven options between each anchored pair. One end of each scale was considered a 'positive' anchor, e.g., good, and one end was
'negative', e.g., bad. Although no numbers appeared on the questionnaire, the scale ranged from -3 to +3. The positive and negative anchors were alternated, as specified above, in an attempt to avoid inducing a response set. As a result, each subject made a total of 156 ratings on the Semantic Differential. Two measures of dichotomous thinking were obtained based upon the method used by Neuringer (1961). The first method was a simple frequency count of each type of rating for each subject e.g. the number of -3s or the number of +1s that each subject used. Nine variables were computed for each subject, including: the number of -3s, -2s, -1s, 0s, +1s, +2s, +3s, a combination of the +3s and -3s, and finally a composite of the number of +3s, -3s, and 0’s. Dichotomous thinking was operationally defined as increasing the greater the number of 3’s utilized. They were split into positive and negative to investigate possible differences in the use of positive versus negative extreme evaluations. The other measure of dichotomous thinking was obtained by first putting the 18 concepts into nine opposing pairs, e.g., life-death. Then each rating of life was compared to each rating for death on the anchored scales and nine difference scores were computed using absolute values. The nine difference scores were summed for each opposing pair of concepts. This resulted in nine difference scores (one for each pair of opposing concepts). This was done in order to test for differences in
evaluations among the different concept pairs. Finally, all nine difference scores were summed into a composite difference score.

The Rational Behaviours Inventory (RBI) is a self-report instrument consisting of 37 items rated on a five-point Likert scale. Each item is then assigned a score of one or zero based upon a cutoff score for each item. Some items have a cutoff of three and some have a cutoff of four. Therefore, the total scale score can range from zero to 37, with higher scores demonstrating more rational thinking. The scale was constructed on the basis of Rational Emotive Theory (RET) and contains eleven factor scales related to rational beliefs. Split-half reliability is .73 and test-retest reliability after 3 days is .82 (Shorkey and Whiteman, 1977).

The Life Experiences Survey (LES) is a 64 item self-report measure that is rated on a seven-point Likert scale in a range form -3 to +3. Three scores are usually calculated on this scale: a negative life stress rating, a positive life stress rating, and a total life stress rating. In addition, a difference score was calculated in which the negative stress score was subtracted from the positive stress score to discern if a greater difference in positive and negative stress may be predictive of suicidal ideation. In addition, similar to the semantic differential, a frequency count for each of the seven possible responses was
calculated. Therefore, the number of -3s, -2s, -1s, 0s, +1s, +2s, and +3s were counted for each subject. Also, a frequency count of the number of life events checked by each subject, regardless of numerical rating assigned to it, was calculated as a variable. The number of positive events and the number of negative events, regardless of numerical rating, were also counted to form two more separate variables. Therefore, a total of 14 different variables were calculated for the Life Experiences Survey. Previous research has shown that the negative life stress rating appears to be the most useful measure in predicting suicidal ideation (Sarason, Johnson and Siegel, 1978).

The Daily Hassles and Uplifts Scale consists of 117 hassles and 135 uplifts rated on a 3-point scale for intensity for the hassles and frequency for the uplifts. Average test-retest correlations for one month for the Hassles Scale for frequency were equal to .79 and for intensity .48. The corresponding figures for the Uplifts scale are .72 and .60 (Kanner et al., 1981). The Hassles scale was quantified into five different variables: a sum of the hassles' ratings, and frequency counts of the number of 1's, 2's and 3's and count of the total number of hassles checked regardless of numerical rating. The Uplifts scale was similarly calculated. Finally, the sum of the hassles and uplifts were added to from a total stress score.
The Center for Epidemiological Studies Depression Scale (CES-D) is a measure of depression for general population surveys. The measure contains 20 items in which respondents rate the frequency of occurrence of certain thoughts and behaviours that have happened in the previous week. Each item is given a score ranging from 1-4 and total scale scores range from 20-80. Internal consistency is approximately .85. It has been found to have moderate discriminant validity between normal and psychiatric populations and good construct validity (Radloff, 1977).

The Hopelessness Scale (HS) is a 20 item true-false measure. Total scale scores range from 0-20. Internal consistency is .93 and its validity in predicting suicide is extensive (Beck, Weismann, Lester and Trexler 1974).

The Adult Suicidal Ideation Questionnaire consists of 25 items that are scored in a range of 0-6 depending upon how often a particular thought has occurred to an individual concerning suicide. Total scale scores range from 0-150 and 6 items are deemed critical items. Internal consistency has been found to be approximately .96 and it has been found to have good validity (Reynolds, 1991). Due to a clerical error, four items were inadvertently left out of the scale. A separate data set consisting of 160 subjects recruited from the same population as the present study revealed a Pearson correlation coefficient of .9968 between the scores
based on 25 items (full scale) and the 21 items used in the present study.

**Procedure**

The measures were given in one packet and administered in groups. All subjects were given a list of psychological resources. In addition, the subjects were asked to avoid putting any identifying information on the questionnaires to ensure confidentiality. Administration time was approximately 40 to 70 minutes.
CHAPTER III
RESULTS

Reliability

Measures of internal consistency were calculated to ensure comparability to published estimates of reliability. Cronbach's alpha was calculated for all scales. Due to the nature of the Hassles, Uplifts, and Life Experiences Survey, no alpha could be computed as a result of too many items being left blank. (This was not due to carelessness on the part of the participants. The instructions for these scales specify to respond only to those items which pertain to them.) All of the remaining scales demonstrated high internal consistency. Alphas were .95 for the Adult Suicide Ideation Questionnaire, .91 for the CESD depression scale, .88 for the Hopelessness scale, and .82 for the Rational Behaviours Inventory.

Means

The means were calculated for all of the measures. For a summary of the means and standard deviations of selected variables, see Table 1.

Dichotomous thinking and the perception of stress

Recall that there were two methods to measure dichotomous thinking on Neuringer's Semantic Differential. See Table 2 for an abbreviated correlation matrix between the measures of distorted thinking and the measures of stress. The first method involves tallying the
<table>
<thead>
<tr>
<th>Measure</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of extreme scores on the SDS(^a)</td>
<td>71.1 (SD=28.2)</td>
</tr>
<tr>
<td>Number of positive extremes on the SDS(^a)</td>
<td>38.7 (SD=17.7)</td>
</tr>
<tr>
<td>Number of negative extremes on the SDS(^a)</td>
<td>32.4 (SD=13.8)</td>
</tr>
<tr>
<td>Summed difference score on the SDS(^a)</td>
<td>201.4 (SD=44.1)</td>
</tr>
<tr>
<td>Rational Behaviours Inventory</td>
<td>22.5 (SD=5.3)</td>
</tr>
<tr>
<td>Number of events checked on the LES(^b)</td>
<td>10.2 (SD=6.5)</td>
</tr>
<tr>
<td>Total stress score on the LES(^b)</td>
<td>19.9 (SD=14.3)</td>
</tr>
<tr>
<td>Positive stress score on the LES(^b)</td>
<td>8.6 (SD=7.7)</td>
</tr>
<tr>
<td>Negative stress score on the LES(^b)</td>
<td>10.7 (SD=10.9)</td>
</tr>
<tr>
<td>Number of positive extremes on the LES(^b)</td>
<td>1.5 (SD=2.1)</td>
</tr>
<tr>
<td>Number of negative extremes on the LES(^b)</td>
<td>1.8 (SD=3.1)</td>
</tr>
<tr>
<td>Total Hassles score</td>
<td>52.5 (SD=40.6)</td>
</tr>
<tr>
<td>Number of Hassles reported</td>
<td>30.0 (SD=20.3)</td>
</tr>
<tr>
<td>Number of Hassles rated as extreme</td>
<td>6.7 (SD=8.6)</td>
</tr>
<tr>
<td>Total Uplifts score</td>
<td>80.9 (SD=47.4)</td>
</tr>
<tr>
<td>Number of Uplifts reported</td>
<td>44.6 (SD=23.4)</td>
</tr>
<tr>
<td>Number of Uplifts rated as extreme</td>
<td>10.6 (SD=10.3)</td>
</tr>
<tr>
<td>CES-D Depression scale</td>
<td>35.6 (SD=11.5)</td>
</tr>
<tr>
<td>Hopelessness scale</td>
<td>3.9 (SD=4.1)</td>
</tr>
<tr>
<td>Adult Suicide Ideation Questionnaire</td>
<td>11.6 (SD=12.5)</td>
</tr>
</tbody>
</table>

Note \(^a\) refers to the Semantic Differential Scale
\(^b\) refers to the Life Experience Survey
frequency of use of the extreme ratings on the Neuringer's Semantic Differential. It was found that the number of three's (both positive and negative combined) was significantly correlated with the positive stress score on the Life Experiences Survey \( r = .16, p < .05 \), but not with the negative stress score, \( r = .03, \text{n.s.} \) or the total stress score, \( r = .11, \text{n.s.} \). Similarly, there was a correlation in the number of extreme evaluations on the semantic differential and the uplifts, \( r = .17, p < .05 \), but not with the hassles score \( r = .00, \text{n.s.} \). Thus, extreme or dichotomous thinking appears to be correlated with the total positive stress score and uplifts score only.

Inspection of the correlations between dichotomous thinking and extreme evaluations on the stress scales revealed some interesting results. The number of extreme evaluations on Neuringer's Semantic Differential was correlated with both the number of positive (\( r = .22, p < .001 \)) and negative (\( r = .15, p < .05 \)) extreme evaluations on the Life Experiences Survey, and the total combined number of positive and negative extreme evaluations on the Life Experiences Survey, \( r = .23, p < .001 \). In addition, there was a significant correlation between Neuringer's Semantic Differential and the number of extreme scores on the uplifts scale \( r = .23, p < .001 \), but not with the number of extreme evaluations on the Hassles scale, \( r = .08, \text{n.s.} \). In summary, dichotomous thinking was not correlated with the number of
Table 2  Correlations of measures of distorted cognitions with measure of stress and distress

<table>
<thead>
<tr>
<th></th>
<th>TXSDS</th>
<th>PXSDS</th>
<th>NXSDS</th>
<th>DifSDS</th>
<th>RBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLES</td>
<td>.11</td>
<td>.05</td>
<td>.16’</td>
<td>.11</td>
<td>-.23***</td>
</tr>
<tr>
<td>PLES</td>
<td>.16’</td>
<td>.15’</td>
<td>.13’</td>
<td>.07</td>
<td>.01</td>
</tr>
<tr>
<td>NLES</td>
<td>.03</td>
<td>-.04</td>
<td>.11</td>
<td>.10</td>
<td>-.31***</td>
</tr>
<tr>
<td>LES-NER</td>
<td>.02</td>
<td>.02</td>
<td>.07</td>
<td>.05</td>
<td>-.22***</td>
</tr>
<tr>
<td>TXLES</td>
<td>.22***</td>
<td>.16’</td>
<td>.25***</td>
<td>.16’</td>
<td>-.20**</td>
</tr>
<tr>
<td>PXLES</td>
<td>.22’</td>
<td>.22’</td>
<td>.16</td>
<td>.07</td>
<td>.03</td>
</tr>
<tr>
<td>NXLES</td>
<td>.15’</td>
<td>.07</td>
<td>.23***</td>
<td>.17’</td>
<td>-.29***</td>
</tr>
<tr>
<td>HASS</td>
<td>.00</td>
<td>-.08</td>
<td>.11</td>
<td>.05</td>
<td>-.43***</td>
</tr>
<tr>
<td>HASS-NR</td>
<td>-.03</td>
<td>-.10</td>
<td>.07</td>
<td>.00</td>
<td>-.35***</td>
</tr>
<tr>
<td>XHASS</td>
<td>.08</td>
<td>-.02</td>
<td>.18’</td>
<td>.13’</td>
<td>-.46***</td>
</tr>
<tr>
<td>UPLIFTS</td>
<td>.17’</td>
<td>.17’</td>
<td>.12</td>
<td>.09</td>
<td>.13’</td>
</tr>
<tr>
<td>UPLIFTS-NR</td>
<td>.09</td>
<td>.09</td>
<td>.07</td>
<td>.05</td>
<td>1.00</td>
</tr>
<tr>
<td>XUPLIFTS</td>
<td>.23***</td>
<td>.23***</td>
<td>.18’</td>
<td>.10</td>
<td>.15’</td>
</tr>
<tr>
<td>RBI</td>
<td>-.12</td>
<td>.02</td>
<td>-.28***</td>
<td>-.30***</td>
<td>1.00</td>
</tr>
<tr>
<td>CESD</td>
<td>-.05</td>
<td>-.15’</td>
<td>.10</td>
<td>.09</td>
<td>-.50***</td>
</tr>
<tr>
<td>BHS</td>
<td>-.06</td>
<td>-.15’</td>
<td>.08</td>
<td>.07</td>
<td>-.53***</td>
</tr>
<tr>
<td>ASIO</td>
<td>-.18’</td>
<td>-.20</td>
<td>-.11</td>
<td>-.06</td>
<td>-.37***</td>
</tr>
</tbody>
</table>

Note.  TLES = Total stress score on the Life Experience Survey (LES); PLES = Positive stress score on the LES; NLES = Negative stress score on the LES; LES-NER = Number of events rated as extremely positive on the LES; TXLES = Total number of events rated as extremely positive on the LES; PXLES = Number of events rated as extremely positive on the LES; NXLES = Number of events rated as extremely negative on the LES; HASS = Hassles; HASS-NR = Total number of hassles reported; XHASS = Number of extreme hassles reported; UPLIFTS-NR = Total number of uplifts reported; XUPLIFTS = Number of extreme uplifts reported; RBI = Rational Behavioural Inventory; CESD = Center for Epidemiological Studies-Depression; BHS = Beck’s Hopelessness Scale; ASIO = Adult Suicide Ideation Questionnaire; TXSDS = Total number of extreme ratings on Neuringer’s Semantic Differential Scale; PXSDS = Number of positive extreme ratings on the SDS; NXSDS = Number of negative extreme ratings on the SDS; DifSDS = Difference scores on the SDS; *p<.05  "p<.01  ""p<.001

stressful events reported, or with negative life stress and hassles. However, dichotomous thinking was negatively related to positive life stress and uplifts.

According to Watson & Tellegen (1985), self-reported mood in many studies reveals that positive affect and negative affect are the first two factors to emerge in many factor analyses. As a result, the positive and negative
extreme evaluations were looked at separately in the correlation matrix (See Table 2). It was found that the negative extreme evaluations on Neuringer's Semantic Differential were correlated with the positive stress score on the LES \(r=.13, p<.05\) and the total stress score \(r=.16, p<.05\), but not with the negative stress score, \(r=.12, \text{n.s.}\). The extreme positive evaluations on the semantic differential were correlated only with the positive stress score, \(r=.15, p<.05\).

The negative extreme evaluations on the semantic differential were correlated with both the negative extreme evaluations \(r=.23, p<.001\) and positive extreme evaluations \(r=.16, p<.05\) on the Life Experiences Survey. However, the positive extreme evaluations on the semantic differential were correlated only with the positive extreme evaluations on the Life Experiences Survey, \(r=.22, p<.001\) and not the negative extreme evaluations, \(r=.07, \text{n.s.}\).

On the Hassles and Uplifts scales, the negative extreme evaluations on the Semantic Differential were not correlated with either the total Hassles \(r=.11, \text{n.s.}\) or Uplifts score \(r=.12, \text{n.s.}\). The positive extreme evaluations were correlated with the total Uplifts score \(r=.17, p<.01\) but not with the total Hassles score \(r=-.08, \text{n.s.}\).

The negative extreme evaluations on the Semantic Differential were correlated with the extreme evaluations on the Hassles scale \(r=.18, p<.01\) and on the Uplifts scale
(r = .17, p < .01). The positive extreme evaluations of the Semantic Differential were correlated the extreme evaluations on the Uplifts scale (r = .23, p < .001), but not with the extreme evaluations on the Hassles scale, r = -.02, n.s. In summary, positive extreme thinking was related to extreme reporting of positive life stress and uplifts, while negative extreme thinking was more related to reporting both positive and negative life events, and Hassles and Uplifts as being extreme.

Of the remaining scales of interest, the positive extreme evaluations of the Semantic Differential were negatively correlated with the Adult Suicide Ideation Questionnaire (r = -.20, p < .01), the Center for Epidemiological Studies-Depression scale (r = -.15, p < .05) and the Hopelessness scale (r = -.15, p < .05), but no significant correlation with the Rational Behaviours Inventory (r = .02, n.s.). The negative extreme evaluations of the Semantic Differential demonstrated the opposite trend. There was a significant negative correlation with the Rational Behaviours Inventory (r = -.28, p < .001) and no correlation with the Adult Suicide Ideation Questionnaire (r = -.11, n.s.), the Center for Epidemiological Studies-Depression scale (r = .09, n.s.) or the Hopelessness scale (r = .08, n.s.).

The other measure of dichotomous thinking from the semantic differential was the difference score summed across
the differences in ratings between the nine pairs of opposing concepts that were rated (Table 2). Significant correlations were found on this measure and the Rational Behaviours Inventory ($r = -0.30, p < 0.001$), the extreme negative evaluations on the Life Experiences Survey ($r = 0.17, p < 0.01$) and the extreme evaluations of the Hassles ($r = 0.13, p < 0.05$). All other correlations were non-significant. See Table 3 for a summary of the differences between positive dichotomous thinking, negative dichotomous thinking and the combined measure of dichotomous thinking.

Rational thinking

Inspection of the correlations between the Rational Behaviours Inventory and the other variables computed produced some interesting results (See Table 2). A higher score is associated with more rational thinking. The RBI was significantly correlated with particular measures on Neuringer's Semantic Differential (see above). In its relationship to the measures of stress, the RBI was correlated with the total Hassles score ($r = -0.43, p < 0.001$) and the total Uplifts score ($r = 0.13, p < 0.05$). On the Life Experiences Survey, there was a significant correlation between the Rational Behaviors Inventory and the negative stress score ($r = -0.31, p < 0.001$), but not with the positive stress score ($r = 0.01, n.s.$).
Table 3 Summary of Differences Between Combined Dichotomous Thinking, Negative Dichotomous Thinking, and Positive Dichotomous Thinking

<table>
<thead>
<tr>
<th></th>
<th>Combined Dichotomous Thinking</th>
<th>Negative Dichotomous Thinking</th>
<th>Positive Dichotomous Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of events reported</td>
<td>No significant relation</td>
<td>No significant relation</td>
<td>No significant relation</td>
</tr>
<tr>
<td>Number of negative extreme ratings of stress</td>
<td>Positive relation to major life events but not to hassles</td>
<td>Positive relation to both major life events and hassles</td>
<td>No significant relation to major life events or hassles</td>
</tr>
<tr>
<td>Number of positive extreme ratings of stress</td>
<td>Positive relation to major life events and uplifts</td>
<td>Positive relation to major life events and uplifts</td>
<td>Positive relation to major life events and uplifts</td>
</tr>
<tr>
<td>Total negative life stress score</td>
<td>No significant relation</td>
<td>No significant relation</td>
<td>No significant relation</td>
</tr>
<tr>
<td>Total positive life stress score</td>
<td>Positive relation to both life events and uplifts</td>
<td>Positive relation to life events only</td>
<td>Positive relation to both life events and uplifts</td>
</tr>
<tr>
<td>Rational Beliefs</td>
<td>Not sig.</td>
<td>Negative relation</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Depression</td>
<td>Not sig.</td>
<td>Not sig.</td>
<td>Negative relation</td>
</tr>
<tr>
<td>Hopelessness</td>
<td>Not sig.</td>
<td>Not sig.</td>
<td>Negative relation</td>
</tr>
<tr>
<td>Suicidal Ideation</td>
<td>Negative relation</td>
<td>Not sig.</td>
<td>Negative relation</td>
</tr>
</tbody>
</table>
In looking more closely at the relation between the RBI and the stress scales, it was found that the RBI was significantly correlated with the number of extreme evaluations on the Hassles scale \( r = .46, p < .001 \) and the total number of hassles reported (regardless of the number assigned to it; \( r = -.35, p < .001 \)). There was also a correlation between the RBI and the number of extreme evaluations on the Uplifts scale \( r = .15, p < .05 \), but not with the total number of uplifts reported \( r = .09, \text{n.s.} \).

Similar results were found on the Life Experiences Survey. There was a correlation between the RBI and the number of extremenegative evaluations on the Life Experiences Survey \( r = -.29, p < .001 \), but not with the number of extreme positive evaluations \( r = .03, \text{n.s.} \). Also, there was a correlation between the RBI and the total number of stressful events (regardless of its numerical rating), \( r = -.22, p < .001 \). Separating the total number of positive and negative events reported revealed no significant correlation between the RBI and the number of positive events \( r = .00, \text{n.s.} \), but a significant correlation between the RBI and the number of negative events reported \( r = -.28, p < .001 \). In summary, the rational beliefs were negatively correlated with the number of negative events reported, degree of perceive negative life stress and the negative extreme evaluations of stress. Rational beliefs were not correlated with any of the indicators of positive life stress on the
Life Experiences Survey, but had a small relation to the total Uplifts score and the number of uplifts rated as extreme.

The RBI had moderate correlations with the other measures of personal distress. Specifically the RBI was significantly correlated with the depression scale ($r = -.50, p < .001$), the Hopelessness scale ($r = -.53, p < .001$), and the ASIQ ($r = -.37, p < .001$).
Table 4  Correlations among the variables

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>DifSDS</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>NXSDS</td>
<td>0.78*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>RBI</td>
<td>-0.30*</td>
<td>-0.28*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>NLES</td>
<td>0.10</td>
<td>0.12</td>
<td>-0.31*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>HASSLES</td>
<td>0.05</td>
<td>0.11</td>
<td>-0.43*</td>
<td>0.46*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>CESD</td>
<td>0.08</td>
<td>0.09</td>
<td>-0.50*</td>
<td>0.42*</td>
<td>0.50*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>BHS</td>
<td>0.07</td>
<td>0.08</td>
<td>-0.53*</td>
<td>0.38*</td>
<td>0.36*</td>
<td>0.58*</td>
<td>1.00</td>
</tr>
<tr>
<td>8.</td>
<td>ASIQ</td>
<td>-0.06</td>
<td>-0.11</td>
<td>-0.37*</td>
<td>0.25*</td>
<td>0.31*</td>
<td>0.57*</td>
<td>0.56*</td>
</tr>
</tbody>
</table>

Note. DifSDS = The difference scores from Neuringer’s Semantic Differential Scale (SDS); NXSDS = Negative extremes on Neuringer’s SDS; RBI = Rational Behaviours Inventory; NLES = Negative life stress on the Life Experiences Survey; CESD = Center for Epidemiological Studies-Depression scale; BHS = Beck’s Hopelessness Scale; ASIQ = Adult Suicide Ideation Questionnaire. *p<.001
Accounting for variance in suicidal ideation

The variance in suicidal ideation scores was substantially restricted in its range. Possible ranges for the 21 items used on the Adult Suicide Ideation Questionnaire would be 0 to 126. The range for the present sample was 0 to 76. Only one cutoff score is provided in the manual, whereby scores of 31 and over represent serious suicidal ideation (Reynolds, 1991). Only 16 subjects attained a score of 31 or greater, with sixty percent of the subjects scoring 11 or less. As a result, the attenuated variance in suicidal ideation scores hinders the magnitude of the correlations computed. See Table 4 for a correlation matrix of the major variables computed.

Nevertheless, several multiple regression analyses were carried out in an attempt to identify the variables that accounted for the most variance in suicidal ideation scores. The first analysis was a standard multiple regression, using SPSS * REGRESSION, with the Adult Suicide Ideation Questionnaire scores as the dependent variable and the difference scores on Neuringer's Semantic Differential, the negative extreme evaluations of Neuringer's Semantic Differential, rational behaviours, negative life stress on the Life Experience Survey, hassles, depression and hopelessness as the independent variables. See Table 5 for the unstandardized regression coefficients, the standardized regression coefficients, the semipartial correlations (sr^2),
and R, R², and the adjusted R². The regression (R = .67) was significantly different from zero, F(7, 225) = 25.6, p < .001. Three of the seven independent variables entered contributed significantly to the variance in suicidal ideation scores. These included hopelessness (sr² = .06), depression (sr² = .08), and the negative extreme scores on Neuringer’s Semantic Differential (sr² = .02). Rational behaviours, hassles, negative life stress and the difference scores on Neuringer’s Semantic Differential were all non-significant. The seven variables entered contributed a shared variance of .28. As a result, 44% (43% adjusted) of the variance in suicidal ideation scores was accounted for by the preceding variables.

According to Tabachnick & Fidell (1989), an inspection of the distributions should be undertaken before a multiple regression is carried out. They suggest that skewed distributions may result in an attenuated Multiple R. Inspection of the distributions using SPSS frequencies revealed substantial positive skewness and kurtosis on some of the variables of interest. As a result, some of the distributions were transformed. Log transformations of the Life Experiences Survey, suicidal ideation scores, Hassles, Uplifts, and hopelessness scores were done. The depression scores were modified using a square root transformation. Although these transformations improved the shape of the distributions, the multiple R calculated using a standard
multiple regression with the transformed variables was less than that of the untransformed

Table 5. Standard Regression On Suicidal Ideation by Negative Extreme Thinking, Difference Scores, Rational Beliefs, Negative Life Stress, Hassles, Depression, and Hopelessness

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Beta</th>
<th>( \text{sr}^2 ) (unique)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference Scores</td>
<td>.01</td>
<td>.04</td>
<td>.00</td>
</tr>
<tr>
<td>Hassles</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Hopelessness</td>
<td>1.01</td>
<td>.33</td>
<td>.06</td>
</tr>
<tr>
<td>Negative Life Stress</td>
<td>-.04</td>
<td>-.04</td>
<td>.00</td>
</tr>
<tr>
<td>Rational Beliefs</td>
<td>-.14</td>
<td>-.06</td>
<td>.00</td>
</tr>
<tr>
<td>Depression</td>
<td>.42</td>
<td>.39</td>
<td>.08</td>
</tr>
<tr>
<td>Negative Extreme thinking</td>
<td>-.20</td>
<td>-.22</td>
<td>.02</td>
</tr>
</tbody>
</table>

\( R^2 = .44 \)
Adj. \( R^2 = .43 \)
\( R = .67 \)

variables (\( R = .59 \) vs. \( R = .67 \)).

Tabachnick and Fidell (1989) suggest that transformations may not be necessary if all the distributions are skewed in approximately the same way. The present variables were all positively skewed. In addition, Tabachnick and Fidell (1989) suggest that transformation of
the variables may make interpretation of the results more
difficult. Therefore, given the difficulties with
interpretation, the similarities in the direction of the
skewness of the distributions, and the reduced multiple $R$,
it was decided to retain the untransformed variables for all
analyses.

Subsequently, an hierarchical multiple regression
was computed with suicidal ideation as the dependent
variable to ascertain if dichotomous thinking added anything
to the prediction of suicidal ideation beyond that provided
by depression and hopelessness. Table 6 displays the
unstandardized regression coefficients, the standardized
regression coefficients, the semipartial correlations ($sr^2$),
and $R$, $R^2$, and adjusted $R^2$ after all three independent
variables were entered. $R$ was significantly different at
the end of each step. After step 4 with all the independent
variables entered $R = .66$, $F(4, 229) = 44.86$, $p < .001$.

After step 1, with depression entered into the
equation, $R^2 = .33$, $F_{Inc}(1, 229) = 115.35$, $p < .001$. After
step 2, with the addition of hopelessness, $R^2 = .41$, $F_{Inc}(1, 229) = 29.55$, $p < .001$. After step 3, with the addition of
the negative extreme scores’ measure of dichotomous
thinking, $R^2 = .44$, $F_{Inc}(1, 229) = 12.58$, $p < .001$. After
step 4, with the difference score on Neuringer’s Semantic
Differential entered into the equation, $R^2 = .44$, $F_{Inc}(1, 229) = .34$, $p > .05$. As a result, the addition of the
negative extremes measure of dichotomous thinking did reliably improve the prediction of suicidal ideation, but the addition of the difference scores alone did not.

It was desired to evaluate the respective contributions of the two measures of negative dichotomous thinking in the prediction of suicidal ideation, independently of hopelessness.

Table 6  Hierarchical Regression on Suicidal Ideation by Depression, Hopelessness, Negative Extreme Thinking and Difference Scores

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Beta</th>
<th>(sr^2) (incremental)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>.43</td>
<td>.40</td>
<td>.33</td>
</tr>
<tr>
<td>Hopelessness</td>
<td>1.04</td>
<td>.34</td>
<td>.08</td>
</tr>
<tr>
<td>Neg. Extreme Thinking</td>
<td>-.19</td>
<td>-.21</td>
<td>.03</td>
</tr>
<tr>
<td>Difference Scores</td>
<td>.01</td>
<td>.05</td>
<td>.00</td>
</tr>
</tbody>
</table>

\(R^2 = .44\)

Adj. \(R^2 = .43\)

\(R = .66\)

and depression. To this end two separate hierarchical regressions were computed. The first regression had suicidal ideation as the independent variable and the difference scores, then the negative extreme thinking were entered as the independent variables. Table 7 displays the unstandardized regression coefficients, the semipartial
correlations (sr²), and R, R², and the adjusted R² after the two independent variables were entered. R was not significantly different from zero at the end of either step. After step 2 with both variables entered, R = .12, F(2, 231) = 1.67, p > .05.

Reversing the order of entry of the two independent variables had no effect. The regression was not significantly different from zero at either step. After step 2, with both variables entered, R = .12, F(2, 231) = 1.67, p > .05. See Table 8 for the unstandardized regression coefficients, the semipartial correlations (sr²), and R, R², and the adjusted R² after the two independent variables were entered.

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Beta</th>
<th>sr²(incremental)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference Scores</td>
<td>.02</td>
<td>.06</td>
<td>.00</td>
</tr>
<tr>
<td>Neg. Extreme Thinking</td>
<td>-.15</td>
<td>.10</td>
<td>.01</td>
</tr>
</tbody>
</table>

R² = .01
Adj. R² = .01
R = .12
### Table 8: Hierarchical Regression on Suicidal Ideation by Negative Extreme Thinking and Difference Scores

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Beta</th>
<th>$\text{sr}^2$(incremental)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neg. Extreme Thinking</td>
<td>-.15</td>
<td>-.16</td>
<td>.01</td>
</tr>
<tr>
<td>Difference Scores</td>
<td>.02</td>
<td>.06</td>
<td>.00</td>
</tr>
</tbody>
</table>

$R^2 = .01$

Adj. $R^2 = .01$

$R = .11$
Chapter IV
Discussion

The present research was undertaken to look at measures of dichotomous thinking and irrational beliefs, and their relationship to each other, their relationship to life stress, and in turn their contribution to the prediction of suicidal ideation. The following sections will address each of the hypotheses separately, examine the implications of the findings, discuss the limitations of the study, and make suggestions for future research.

Are distorted cognitions related to perception of stress?

It was hypothesized that dichotomous thinking, as measured by Neuringer's Semantic Differential, would be correlated with extreme ratings on measures of stress, but not to the number of stressful events reported. In looking at the combined positive and negative extreme ratings on Neuringer's Semantic differential, it was found that these ratings were related to the positive stress score and to the positive extreme ratings and the negative extreme ratings on the Life Experience Survey, respectively. However, there was no relation to the number of stressful events reported. Similar to the positive stress score, the extreme ratings on Neuringer's Semantic Differential were related to the total uplifts score and to the number of extreme ratings on the uplifts score, but no relation to the number of uplifts was obtained. The results for the Hassles
scale were similar to the negative life stress score. Specifically, there was no relation to the total score, the number of extreme ratings, or the number of hassles reported.

These results and the fact that dichotomous thinking was found to be significantly negatively correlated with suicidal ideation suggests that there is a positive bias in the extreme thinking of the present sample. The presence of positive extreme thinking appears to be related to reporting the same number of uplifts and positive stressful events, but they are rated as more extremely positive and as such, may act as protective factor in suicidal ideation.

**Positive vs. negative dichotomous thinking**

As mentioned previously, Watson & Tellegen (1985) found that many different scales split into positive and negative factors, suggesting that positive and negative evaluations do not demonstrate the same pattern. The present study supported this contention. Both positive and negative dichotomous thinking, measured separately, were unrelated to the number of stressful events reported on the Life Experience Survey, the Hassles scale or the Uplifts scale. In addition, both measures were significantly correlated with the number of positive extreme ratings and to the number of combined negative and positive extreme ratings on the Life Experience Survey. However, only the negative
dichotomous thinking was related to the number of negative extremes on the Life Experience Survey.

The same pattern was revealed on the Hassles & Uplifts scale. Positive dichotomous thinking was related to the total Uplifts score and the number of extreme ratings. Negative dichotomous thinking was related to the number of extreme ratings on the Hassles scale, although it was not related to the total Hassles score.

In comparing their relationship to the measures of distress calculated in this study, some interesting differences prevailed. The positive dichotomous thinking was negatively related to depression, hopelessness, and suicidal ideation. The negative dichotomous thinking was unrelated to these three variables. The results presented suggest that it is an absence of positive thinking and not the presence of negative thinking which is an important determinant of these types of distress. Therefore, these results suggest that Neuringer's (1961) oft-cited results need to be refined. Specifically, extreme thinking is not best understood as occurring on a continuum of high or low. It is more accurate to say that extreme thinking should be divided into their positive and negative components and evaluated separately.
**Dichotomous thinking as measured by difference scores**

The pattern of correlations for the difference scores is somewhat different from the combined positive and negative extreme ratings. The difference scores were the summed absolute differences of the ratings between the nine opposing concept pairs. The difference scores were correlated with the total number of extreme ratings and the number of negative ratings on the Life Experience Survey, but not with the positive extreme ratings. The only other significant correlation related to stress dealt with the number of extreme ratings on the Hassles scale. There were no significant correlations with any of the measures of distress. As a result, the difference scores resemble more the pattern of correlations observed with the negative extreme ratings than the positive or combined extreme ratings of Neuringer's Semantic Differential. Again, this suggests the utility of dividing extreme thinking into its positive and negative components.

**Are irrational beliefs and dichotomous thinking related?**

The Rational Behaviours Inventory was found to be significantly correlated with the difference scores and the negative extreme ratings on Neuringer's Semantic Differential. However, there was no significant relation between the Rational Behaviours Inventory and the total combined positive and negative dichotomous thinking or the positive dichotomous thinking score. As a result, it
appears that only negative dichotomous thinking and irrational beliefs are related. These results also support the utility of dividing extreme thinking into positive and negative scores. In addition, this lends support to Walen, DiGiuseppe & Wessler (1980) argument that dichotomous thinking is a component of irrational beliefs. However, it is negative extreme thinking and not positive extreme thinking that is related to irrational beliefs.

**Accounting for variance in suicidal ideation**

As expected, the multiple regression revealed that depression and hopelessness were the variables that most accounted for the variance in suicidal ideation. The only other variable that reliably accounted for any more variance above and beyond these two variables was the number of negative extreme evaluations on Neuringer's Semantic Differential. Many of the other variables looked at had higher bivariate correlations with suicidal ideation, however negative extreme thinking shared less variance with hopelessness and depression than these other variables.

Specifically, positive extreme thinking was negatively related to suicidal ideation, depression, and hopelessness. In addition, positive extreme thinking was correlated with extreme positive evaluations of stress, suggesting that it may act as a buffer to experiencing higher levels of negative stress. However, this buffer did not show up in the regression for suicidal ideation. It is most likely
that the variance accounted for by positive extreme thinking was shared with depression and/or hopelessness.

In general, the interpretation is somewhat complicated. When the bivariate correlations were examined, it appeared that the absence of positive extreme thinking was more related to suicidal ideation than the presence of negative extreme thinking. As discussed above, it appeared that extreme positive thinking led to more extreme evaluations of positive stress and therefore may have acted as a protective factor. This would imply that the focus of treatment should be on creating positive evaluations and affect in depressed individuals. However, the multiple regression analyses revealed the opposite result. Specifically, that negative extreme thinking accounted for more variance in suicidal ideation, above and beyond hopelessness and depression, than positive extreme thinking. These results suggest that positive and negative extreme thinking become important at different points in the suicidal process. It would appear that positive extreme thinking may decrease the probability of depression and hopelessness. However, if an individual were to become depressed, then negative extreme thinking may lead to a greater incidence of suicidal ideation.

In attempting to discern whether major life events or hassles would be more predictive of suicidal ideation, no firm conclusion could be put forth. Neither of these variables loaded significantly on the regression although
both correlated significantly with suicidal ideation in their respective bivariate correlations.

**Limitations of the study**

One of the major limitations of the study is the use of college students for the sample. The use of this sample limits the generalizability of the findings to the population at large and to a more clinical population. In addition, the use of this population resulted in a restricted range of suicidal ideation scores thereby attenuating the relationships found between suicidal ideation and the other variables studied. A related problem was the positive skewness of many of the distributions. This reality may also have affected the relationship between the variables. Although transformations have been recommended to compensate for this problem, it was found that transformation did not help in increasing the multiple R.

The other major limitation of the study was the method used. Since this was a correlational design, no firm conclusions concerning causality can be made. In addition, the use of multiple regression procedures has been known to capitalize on chance and which can result in the regression coefficients changing across different samples (Darlington, 1968). Therefore, replication and cross-validation on clinical samples would be desirable.
Suggestions for future research

The finding that hopelessness and depression are predictive of suicidal ideation has become a firmly entrenched conclusion. Many other variables have been implicated in the predisposition to suicidal ideation using multivariate research. One direction for future research may be to attempt a path analysis and/or causal modelling of suicidal ideation. Specifically, the antecedents of suicidal ideation are hopelessness and depression. Research that would look at the antecedents of these two variables would be the first step in attempting to construct a causal path. One possibility could be that dichotomous thinking and irrational beliefs distort the perception of stress which in turn leads to depression and hopelessness, and then perhaps suicidal ideation. Ideally, longitudinal analyses looking at populations at different 'stages' in the suicidal process may lead to conclusions about which variables are important at what stage and how these variables interact with each other to lead someone closer to contemplating suicide.
REFERENCES


Appendix A

Consent Form
CONSENT FORM

I, ____________________________ (please print), hereby understand and consent to the following:

I am being asked by Kevin Smith, a graduate student in psychology, to complete a series of questionnaires concerning style of thinking, beliefs, depression, optimism/pessimism, life stress, and thoughts about suicide. Many of these questions are of a general nature but may be potentially upsetting for some people. I understand that if I am upset by the questions, and need someone to talk to, I can call Dr. Michael Kral (253-4232 ext. 2220). The purpose of this study is to examine the relationship between the way people think, events in their lives, and the way they feel.

I am aware that my participation is completely voluntary. I have the right to withdraw from participation at any time without explanation or penalty, and I may also refrain from answering any questions that I prefer to omit. I may ask questions at any time during my participation. Confidentiality regarding my responses will be protected by not having my name or any other identifying information appear on the survey. A code will appear on all questionnaires, and it will be impossible to match my name with my questionnaires. The results of this study may be published at a later date, but my identity or that of the other participants will not be known. If I want feedback concerning the results of this study, information sheets summarizing the results will be posted in the psychology department at the University of Windsor, once data collection and analysis are completed.

I am being asked to participate on one occasion for approximately one hour and a half. I will receive two (2) experimental credit points for my participation.

This procedure has been reviewed and cleared by the University of Windsor Department of Psychology Ethics Committee. Questions or comments can be directed to the Project Director, Dr. Michael Kral, at ext. 2220, or to the Ethics Committee Chair, Dr. Ron Frisch, at ext. 7012. I have received a copy of this form. The copy I submit to the researcher will be kept separate from my questionnaires to protect my identity. In addition, I have received a list of resources for psychological crises.

I understand this information and voluntarily consent to participate in this study.

__________________________
Signature

__________________________
Date

Dr. Michael Kral
Kevin Smith
Dept. of Psychology
University of Windsor
Windsor, ON, N9B 3P4
253-4232, ext. 2220
VITA AUCTORIS

Kevin R. Smith was born in 1967 in Sherbrooke, Quebec. He graduated from Alexander Galt Regional High School in 1984. From there he went to Champlain Regional College for one year and Queen's University for two years studying economics. Following this, he transferred to Bishop's University and received his honours B.A. in Psychology in 1990. He is currently enrolled in the doctoral program in Adult Clinical Psychology at the University of Windsor. He hopes to receive his M.A. in the fall of 1993 and will continue doctoral studies to obtain the Ph.D.