An In-Depth Investigation of Social Problem-Solving Ability

Melisa Robichaud

A Thesis

in

The Department

of

Psychology

Presented in Partial Fulfillment of the Requirements

for the Degree of Doctor of Philosophy of Arts at

Concordia University

Montreal, Quebec, Canada

August 2005

Your file Votre référence
ISBN: 978-0-494-16277-4
Our file Notre référence
ISBN: 978-0-494-16277-4

ABSTRACT

An In-Depth Investigation of Social Problem-Solving Ability

Melisa Robichaud, Ph.D.
Concordia University, 2005

Social problem solving, the resolution of daily life problematic situations with no readily available solution, is comprised of a series of skills that includes problem solving proper and one's general orientation towards problem solving. Researchers have contended that poor problem-solving ability is a necessary and sufficient condition for developing a psychological disorder. Despite the importance of the construct, current assessment tools have yielded inconsistent and at times contradictory results. The goal of the present research was to develop novel assessment techniques for the measurement of social problem solving.

In the first study, a new questionnaire for the assessment of negative problem orientation was translated from French and validated. Results revealed that the Negative Problem Orientation Questionnaire (NPOQ) was unifactorial, had excellent internal consistency, good test-retest reliability at 5 weeks, and demonstrated convergent and discriminant validity ($N = 201$).

In the second study, the construct validity of the NPOQ was investigated by assessing the relationship between the NPOQ and measures of distress after controlling for conceptually similar personality variables. The measure continued to predict worry and depression scores when entered in the last step of multiple hierarchical regressions ($N = 148$). Moreover, the NPOQ displayed greater specificity to worry (5.6% of the variance) than to depression (1.6%). Results suggested that negative problem orientation

reflects a specific negative predisposition towards problem solving among worriers, compared to a by-product of a general negative thinking style in depression.

In the third study, a novel problem-solving interview was developed to measure performance on six problem-solving steps. Participants completed the interview for a hypothetical and a personal problem, and were separated into two groups according to intolerance of uncertainty levels, a cognitive predisposition linked to worry ($N = 62$). Results revealed that among high intolerance of uncertainty participants, anxiety was related to poor performance on initial stages of problem solving, whereas depression was associated with poor performance on later more elaborative stages. These findings emerged only for the personally-relevant problem, and among individuals high in intolerance of uncertainty, suggesting the context-dependent nature of problem solving as well as the role of threat appraisals on constructive coping.

ACKNOWLEDGEMENTS

I would like to thank, first and foremost, my thesis supervisor, Dr. Michel Dugas. Not only was he a wonderful advisor and an invaluable resource during the development and completion of my dissertation, but he was a constant source of inspiration and a friendly ear to all the myriad of problems that arose throughout the years. Dr. Dugas has always been patient and encouraging, and has shaped my career aspirations both from a research and a clinical perspective. Michel, I cannot thank you enough for everything, and I hope that we continue to work together in the years to come.

I would also like to extend my gratitude toward my committee members, Carsten Wrosch and Adam Radomsky. Carsten, I sincerely appreciate all the help you provided when I needed it, and your willingness to listen and provide assistance whenever problems arose. Adam, you have been a wonderful advisor and friend ever since I have known you. Not only were you a great help with this thesis, but you were always open to any questions I had, and were invaluable to me at many steps along my academic career. Bazoonie.

Many thanks to all the girls in the lab, especially Kristin Buhr, Mary Hedayati, Naomi Koerner, and Nicole Gervais. You all helped me a great deal in the execution of my research, and made the lab a fun place to be. Thanks also to Kathryn Sexton, who was kind enough to listen to me brainstorm over and over again, and was always pleasant and encouraging.

Last but definitely not least, I would like to thank the two most important people in my life, Carolyn Goudreau and Antony Angelis. Mom, you have always been a constant source of love and support, and these last several years when I was toiling on my

thesis were no exception. No one has been better at keeping me on track, and putting things into perspective for me whenever I lost my head or felt overwhelmed. I love you and thank you for everything. Finally, I would like to thank Antony, who has been by my side all these years, and has made many sacrifices for the sake of my education and my career. I know you've been driven near insane by my caterwauling about my dissertation, but you have always believed in me, and I am eternally grateful. I love you very much.

As a final note, I thank Belial and Sammael, for keeping me company while I sat at the computer for hours on end.

CONTRIBUTIONS OF AUTHORS

The following thesis is comprised of three manuscripts, two of which have recently been published:

Robichaud, M., & Dugas, M. J. (2005). Negative problem orientation (part I): Psychometric properties of a new measure. *Behaviour Research and Therapy, 43,* 391-401.

Robichaud, M., & Dugas, M. J. (2005). Negative problem orientation (part II): Construct validity and specificity to worry. *Behaviour Research and Therapy, 43,* 403-412.

The third manuscript is still currently under review, but is expected to be submitted for publication within the year:

Robichaud, M., Dugas, M. J., & Radomsky, A. (2005). The role of intolerance of uncertainty in problem-solving ability. Manuscript under review for submission.

In terms of contribution, I developed the idea for my research focus, namely the study of social problem solving and the development of novel assessment techniques. I designed the protocol for study 1, and my research supervisor, Dr. Michel Dugas, assisted me in the choice of questionnaires to include in the research. For study 2, I consulted with one of my committee members, Dr. Carsten Wrosch, for suggestions on appropriate measures for the assessment of personality variables that are conceptually similar to the construct of negative problem orientation. For study 3, I developed the problem-solving interview, the hypothetical problem for testing, the illustrative problem for instructional purposes, the scoring criteria for each of the problem-solving steps, and the problem-solving manual given to participants following testing. Dr. Dugas and his research team

assisted with the refinement of the interview protocol and the scoring criteria in lab meetings. Dr. Adam Radomsky also provided ideas and suggestions for the interview protocol and related questionnaires. For all three studies, Dr. Dugas was available in a consultation capacity in terms of deciding on the most relevant statistical strategies to use in relation to the research hypotheses. I collected the data for all three studies, trained the coders for scoring of the study 3 data, conducted the statistical analyses, wrote all manuscripts, and revised all written work according to the suggestions and comments of my research supervisor.

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CHAPTER 1

INTRODUCTION

Since the 1950's, researchers from various fields have espoused the importance of solving social problems (e.g., Bloom & Broder, 1950; Osborn, 1963; Skinner, 1953). In contrast to many impersonal or logic problems often used in research (e.g., anagrams), social problems refer to daily life problematic situations where there is no readily available or immediately apparent solution. Moreover, social problems can have more than one acceptable solution, the effectiveness of which depends on the particular individual solving it and the specific environmental factors at the time (D'Zurilla & Nezu, 1999). In their seminal work in this area, D'Zurilla and Goldfried (1971) noted that social problem solving is a complex construct that encompasses both the actual skills required to solve a given problem as well as one's orientation toward problems, that is, an individual's perceptions about personal problem-solving ability and problems in general. Specifically, their prescriptive model of social problem solving includes the components of problem orientation, problem definition and goal formulation, generation of alternative solutions, decision-making, and solution implementation and verification. The authors postulated that the inability to effectively cope with social problems, along with the negative personal and social consequences this engenders, is a necessary and sufficient condition for developing a mental health disorder. Given this assumption, the importance of mastering the components of problem solving is underscored for the individual, and the necessity of accurate measurement and study of the problem-solving construct is of relevance to the mental health researcher.

Problem Solving and Psychological Distress

To date, a plethora of studies have investigated the relationship between psychological distress and the components of problem solving, with deficits being noted among individuals with high trait anxiety, elevated levels of worry, generalized anxiety disorder (GAD), panic disorder, post-traumatic stress disorder, and depression (see Nezu, 2004 for review). In general, it appears that negative problem orientation is consistently the strongest predictor for a multiplicity of anxious and depressive symptomatology, emerging as either the sole or primary problem-solving component exhibiting deficits. As conceptualized by D'Zurilla and Nezu (1999) in an elaborated problem-solving model, negative problem orientation refers to a dysfunctional cognitive-emotional set that reflects the tendency to perceive problems as threatening, to lack confidence in one's problem-solving abilities, to have a low frustration tolerance, and to be pessimistic about the outcome of problem solving. As such, the vast majority of research suggests that individuals experiencing anxious or depressive distress have equivalent problem-solving skills to those experiencing low or moderate distress. Rather, it is this dysfunctional orientation toward problems and problem solving that differentiates individuals high and low on symptom measures of psychopathology.

Despite the primary role of negative problem orientation in terms of the relationship between problem solving and distress, a few studies have found evidence of deficits in problem-solving skills as well. Specifically, depression has been linked to impairments on specific problem-solving steps (e.g., generation of alternatives step; Marx & Schulze, 1991; Marx, Williams, & Claridge, 1992; Nezu & Ronan, 1987). As a result, problem-solving training has been deemed appropriate for the treatment of depression

(Nezu, Nezu, & Perri, 1989), with the essential inclusion of a treatment component specifically targeting negative problem orientation (Nezu & Perri, 1989). Similar findings have not emerged for specific anxiety disorders such as GAD. Excessive worry, the cardinal feature of the disorder, would seem to have a strong conceptual relationship to problem-solving impairments given the fact that worry has been defined by several researchers as a failed attempt at problem solving, and the contention that worriers would have difficulty deciding on a solution for a particular problem (Borkovec, 1985; Davey, 1994a). However, no association has yet been found between GAD worry and problem-solving skills deficits, although negative problem orientation and poor problem-solving confidence appears to be a reliable predictor of worry (e.g., Davey, 1994b, Dugas, Freeston, & Ladouceur, 1997).

Although research to date suggests that problem-solving skills are unrelated to most manifestations of distress, with the exception of individuals suffering from depression or severe psychiatric conditions (e.g., schizophrenia; see Tisdelle & St-Lawrence, 1986 for a review), several questions can nevertheless be raised, particularly as the problem-solving literature contains several contradictions. First, although studies have linked deficits in specific problem-solving steps to depression, several researchers have failed to uncover these impairments (D'Zurilla et al., 1998; Haaga et al., 1995; Reinecke et al., 2001). In attempting to account for this discrepancy, Nezu (2004) states that the null findings emerged with a popular self-report measure whereas an interview measure was used in the studies where differences were found. He notes that unlike the interview protocol, which only assesses certain steps of problem solving, the self-report measure has items related to all steps within a single subscale. The author postulates that

since only selected components of problem-solving skills have shown impairment in relation to depression (e.g., generation of alternatives, decision making), the lack of congruence between self-report and interview measures may be due to the fact that the skills that do not show significant impairment on the self-report measure (e.g., problem definition) overshadowed the actual skills that displayed deficits, such that null results emerged. However this contention has never been specifically investigated, and the author fails to consider that the validity of the self-report measure itself may be a contributing factor. The issue is further complicated by a distinction between process and outcome measures of assessment. D'Zurilla & Maydeu-Olivares (1995) contend that self-report inventories measure problem-solving processes that may facilitate or inhibit performance, whereas interview measures assess actual problem-solving performance, such that process and outcome measures focus on different aspects of problem solving, and would not necessarily be highly related. Yet, a small or moderate relationship should nevertheless be expected, and similar findings across studies of problem-solving impairments among depressed individuals for example, should be anticipated but have failed to occur. In fact, in a study on worry that used both the Means-Ends Problem Solving inventory (MEPS; Platt & Spivack, 1975) and a self-report questionnaire of problem solving, the problem-solving measures were unrelated to each other (Davey, 1994b), suggesting that either the measures are assessing entirely different constructs or that one or both of the measures are not accurately measuring problem-solving ability. A series of studies conducted by Stöber and colleagues (2000, 2002) lends some credence to the latter hypothesis, as a linear reduction in the concreteness of participants' elaborations of their problems decreased as worry level about the particular problem increased. Given

that: 1) the ability to concretely define one's problems is a necessary component of effective problem solving suggesting that skills are in fact impaired according to worry level, 2) despite the aforementioned findings no relationship has emerged between worry and current measures of problem solving, and 3) studies on problem-solving ability and depression have yielded inconsistent and at times contradictory results, it can be postulated that problem-solving measures to date may not be adequately assessing the multi-faceted construct of social problem solving.

The Measurement of Social Problem Solving

Although there are a number of self-report and interview measures of social problem solving that have been developed over the years (see D'Zurilla & Nezu, 1999 for review), currently the three most popular and widely used measures are: 1) the Problem Solving Inventory (PSI; Heppner, 1988); 2) the MEPS (Platt & Spivack, 1975); and 3) the Social Problem-Solving Inventory- Revised (SPSI-R; D'Zurilla, Nezu, & Maydeu-Olivares, 1998). The PSI is a self-report questionnaire that measures problem-solving self-appraisals, such as whether individuals feel that they approach or avoid problematic situations, or whether they feel a sense of personal control over their emotions and behaviours during problem solving. Although Heppner (1988) originally intended the measure to assess the problem-solving components conceptualized by D'Zurilla & Goldfried (1971), factor analyses of the items revealed subscales that appeared to assess self-perceptions about problem-solving behaviour rather than problem-solving ability per se. As a consequence, despite its validity as a measure of personal problem-solving appraisals, the feasibility of the PSI as a measure of individual problem-solving ability is

questionable, particularly as perceptions of ability are often unrelated to actual ability (Bandura, 1997).

The MEPS, on the other hand, is considered an outcome measure that assesses problem-solving performance, as participants are given a hypothetical problem and asked to describe the steps required to achieve a stated end, either through an interview or a paper-and-pencil test. Scores on the MEPS are determined according to the number of relevant means participants generate. Although this measure appears to assess problem-solving ability more directly than the PSI, there are a number of problems with the measure that place its appropriateness in question. First, the MEPS is typically described as a test of "imagination," such that participants may not actually be engaging in the effortful process of social problem-solving, but rather producing a narrative to the "stories" they are presented with (House & Scott, 1996). Second, researchers have varied whether the hypothetical problems in the MEPS were presented in a third-person (e.g., "Jane's problem is...") or a second-person format (e.g., "*your* problem is..."), and this alteration in presentation appears to have a differential effect on problem-solving performance (e.g., Doerfler et al., 1984; Gotlib & Asarnow, 1979; Marx, Williams, & Claridge, 1992). Specifically, individuals might approach problem solving differently depending on whether they are asked to solve their own problems vs. the problems of others. In fact, Doerfler and colleagues (1984) theorized that the third-person format elicits a different schema than the self-schema evoked during the solving of one's own problems. As a consequence, problem-solving performance results on the MEPS may not be generalizable to participants' actual problem-solving abilities in daily life, particularly when hypothetical problems are used during testing. Finally, the MEPS does not provide

an assessment of the problem-solving steps described by D'Zurilla and Goldfried (1971), as it solely measures the frequency and the quality of the steps generated to achieve the desired conclusion, such that if deficits in ability are in fact found, the locus of the problem-solving impairment may be unclear. As a result, although the MEPS is a widely used measure that has received some empirical support in terms of its validity and reliability (see D'Zurilla & Nezu, 1999 for review), it may not be ideal for the identification of deficits in problem-solving ability particularly in terms of personal problems and the identification of specific impairments. This latter critique may hold special relevance in terms of the relationship between social problem solving and distress, as individuals may show selective deficits depending on the particular manifestation of distress (e.g., anxiety or depression).

The final popular measure of social problem solving, the SPSI-R, is a self-report questionnaire that has been identified as the problem-solving process measure with the strongest support in terms of test design and development, theoretical foundation, and convergent and discriminant validity (D'Zurilla & Maydeu-Olivares, 1995). It is a 52-item questionnaire comprised of five subscales, two of which pertain to problem orientation (positive and negative problem orientation) and three reflecting problem-solving styles. Two of the problem-solving style subscales are assumed to inhibit or interfere with the problem-solving process (i.e., impulsivity/carelessness and avoidance), and one is considered a facilitative or constructive dimension (i.e., rational problem solving). The negative problem orientation subscale of the SPSI-R is typically used to measure the problem orientation construct in most current research on problem solving, and the rational problem solving (RPS) subscale is commonly used as a measure of

knowledge and application of problem solving skills (e.g., Belzer, D'Zurilla, & Maydeu-Olivares, 2002; Dugas et al., 1998; D'Zurilla et al., 1998; Kant, D'Zurilla, & Maydeu-Olivares, 1997; McCabe, Blankstein, & Mills, 1999; Nezu et al., 1999; Reinecke, DuBois, & Schultz, 2001). Despite its frequency of use and demonstrated reliability and validity (Chang & D'Zurilla, 1996; D'Zurilla & Chang, 1995; D'Zurilla et al., 1998), there are nevertheless several criticisms that can launched against the SPSI-R, particularly in relation to its appropriateness as a measure of the components of social problem solving.

A major criticism lies in the inconsistency between the model of social problem solving and the measurement of this construct with the SPSI-R. The questionnaire is a revised version of the Social Problem Solving Inventory (SPSI; D'Zurilla and Nezu, 1990), which was originally devised to measure the problem-solving steps described by D'Zurilla & Goldfried (1971). The SPSI was comprised of two overarching scales, problem orientation and problem-solving skills, both of which were divided into subscales. Specifically, the problem orientation scale contained emotional, cognitive, and behavioural subscales, and the skills scale had four subscales that pertained to the major steps of problem solving proper (i.e., problem definition and goal formulation, generation of alternatives, decision making, and solution implementation and verification). However, despite its theoretical link to the problem-solving steps, a factor analysis of the items of the SPSI did not validate any of these scales. Specifically, items relating to each problem-solving skill failed to form distinct factors according to the four theoretical subscales, and the three experiential dimensions of problem orientation also did not emerge (Maydeu-Olivares & D'Zurilla, 1996). Rather, the five subscales relating to

problem orientation and styles were found, and the measure was subsequently shortened and revised into the SPSI-R. Interestingly, although factorial analyses failed to show that the measure distinguished between the specific problem-solving steps, the authors nevertheless stated that items for the steps could be combined to create subscales for each particular step (e.g., problem definition and goal formulation). It therefore appears that although the items in the measure were intended for the assessment of the components of social problem solving, that may not be what it is actually measuring. Moreover, there are limitations with respect to the negative problem orientation and the rational problem-solving scales in particular, both of which have been of primary interest in the study of social problem solving and mental health.

In terms of the negative problem orientation (NPO) subscale, a confusing picture again emerges with respect to theory and measurement. Problem orientation has been described as a motivational process that reflects an individual's awareness of everyday problems and his or her perceptions of ability. D'Zurilla and Maydeu-Olivares (1995) note that problem orientation involves a set of relatively stable cognitive schemas that have affective and behavioural consequences. For example, an individual with a negative orientation may experience feelings of frustration when confronted with a problem and engage in procrastination or avoidance. In the SPSI, this theoretical framework was reflected in the development of three experiential subscales (affective, cognitive, and behavioural dimensions). As these scales did not emerge following factor analysis, two distinct albeit related subscales, positive and negative problem orientation, are used in the SPSI-R. However, there are inconsistencies with the measurement of problem orientation. As stated previously, D'Zurilla and Maydeu-Olivares (1995) distinguished

between process and outcome measures in problem solving, stating that both concepts are not expected to be highly related given additional factors that might contribute to outcome in addition to facilitative or inhibitory processes. Despite this contention, no discrimination is made between the cognitive process of problem orientation and the potential affective and behavioural consequences it may engender. This is particularly the case with the NPO subscale of the SPSI-R, where the construct is described as a dysfunctional cognitive-emotional set that includes low frustration tolerance (D'Zurilla, Nezu, & Maydeu-Olivares, 1998). As a result, process and outcome may be entangled in the measurement of the construct. That is, the cognitive predisposition to have negative beliefs about problems and problem solving may be confused with the consequences these attitudes can have on problem-solving performance (e.g., frustration). Given that the distinction between an individual's orientation towards problems and their actual problem-solving performance is a cardinal feature of D'Zurilla and Goldfried's problem-solving model, the entanglement of process and outcome into a single subscale measure challenges the validity of the scale.

Several critiques can also be launched against the RPS subscale of the SPSI-R. First, as noted previously, items on the original SPSI were developed in order to measure self-reported ability on the different problem-solving steps, however the various skills did not emerge as independent factors. Instead positively worded items relating to effective problem-solving ability (e.g., "When I am trying to solve a problem, I often think of different solutions and then try to combine some of them to make a better solution") were grouped together to form the RPS subscale of the SPSI-R. D'Zurilla and Nezu (1999) describe the scale as a measure of "a constructive problem-solving strategy that may be

defined as the rational, deliberate, and systematic application of effective problem-solving skills" (p. 47). This definition suggests that the RPS assesses actual problem-solving ability, as it is considered a measure of the effective *application* of skills. However, as stated previously, the RPS is unrelated to other measures of problem-solving ability. Given that a relationship, albeit a modest one, between process measures such as the SPSI-R and outcome measures like the MEPS is expected (D'Zurilla & Maydeu-Olivares, 1995), this lack of substantiating findings weakens the validity of the scale. Moreover, few, if any, studies have found a relationship between measures of distress and the RPS, including research on the association between problem solving and depression (see Nezu, 2004 for review). Since several researchers have found problem-solving impairments among depressed individuals, the null findings with the RPS scale suggest not only that the measure has poor concordance with other measures of problem-solving ability, but also places into question the results of studies using the SPSI-R with other indicators of distress.

Another problem with the RPS scale is the assumption that individuals can accurately self-report on their own problem-solving abilities. Given the fact that self-efficacy research suggests a relative independence between perceptions of ability and actual ability (Bandura, 1997) and that the personal relevance of a problem may influence problem-solving performance (Doerfler et al., 1984; Marx et al., 1992), the RPS subscale may not be appropriate for the measurement of problem-solving ability and potential impairments. Rather, the scale appears to assess individuals' knowledge of effective problem-solving skills instead of the application thereof in everyday problematic situations.

In sum, current measures used for the assessment of various social problem-solving components do not appear to be adequately measuring the constructs. Particular difficulties lie in the intermingling of process and outcome in single scales, the apparent (although as yet unclear) role of personal relevance of problematic situations on performance, and the resulting inconsistency of results across measures. If poor problem-solving ability does in fact play a significant role in the development and maintenance of psychological conditions as contended by D'Zurilla and Goldfried (1971), the proper assessment of problem-solving constructs is of vital importance both in terms of research and clinical theory.

The Present Research

The goals of the following studies were two-fold: 1) to develop novel assessment techniques for the assessment of negative problem orientation and social problem-solving skills, and 2) to better understand the relationship of these problem-solving components to excessive worry, the cardinal feature of GAD. As noted previously, only negative problem orientation has emerged as a significant predictor of worry (e.g., Dugas et al., 1997; Dugas et al., 1995), despite the contention by several researchers that GAD worry may actually interfere with the problem-solving process (Davey, 1994a). Moreover, owing to potential confusion between the cognitive predisposition of negative problem orientation and its cognitive, affective, and behavioural consequences on problem-solving performance, the association between worry and negative problem orientation may be an artifact of the measures used.

The first study involved the translation and validation of a new measure of negative problem orientation, the Negative Problem Orientation Questionnaire (NPOQ),

originally developed and validated in French (Gosselin, Pelletier, & Ladouceur, 2000, 2001). Unlike the NPO subscale of the SPSI-R, which contains many emotionally-loaded items, the NPOQ was designed to uniquely assess dysfunctional beliefs about problems and problem solving. In addition, initial factorial, convergent, and discriminant validity analyses were conducted. The second study further examined the construct validity of the NPOQ, as well as its specificity to worry. Since negative problem orientation includes the tendency to view problems as threatening, to doubt one's problem-solving ability, and to be pessimistic about the outcome of problem solving, there is the potential for overlap between the NPOQ and the personality constructs of pessimism, self-mastery, and neuroticism. By controlling for these constructs and examining the unique prediction of negative problem orientation to measures of both worry and depression, the construct validity of the measure, as well as the specific relationship of negative problem orientation to psychological distress, could be established. Finally, the third study involved the development of a novel problem-solving interview, designed to assess problem-solving ability on all the steps described by D'Zurilla and Nezu (1999). Specifically, participants were asked to solve a hypothetical and a personal unsolved problem by answering directed questions pertaining to problem definition, goal formulation, generation of alternative solutions, decision-making, solution implementation and solution verification. Intolerance of uncertainty, a cognitive predisposition that affects how an individual perceives, interprets, and responds to uncertain situations, was used as the variable of interest in identifying potential problem-solving impairments among worried individuals. As recent findings suggest that intolerance of uncertainty may be a more sensitive measure than worry when studying

how individuals process and respond to information (Dugas et al., 2005), it was hypothesized that the focus on symptom measures such as worry, rather than underlying cognitive mechanisms such as intolerance of uncertainty, may in part account for the absence of a relationship between problem-solving ability and GAD. Moreover, the manipulation of personal relevance of the problem was expected to better address the context-dependent nature of problem solving in everyday life.

Abstract

The Negative Problem Orientation (Part I):

Psychometric Properties of a New Measure

Negative problem orientation, a set of dysfunctional attitudes toward social problem solving, has increasingly become an important construct in our understanding of deficits in problem-solving ability in daily life. Until recently, no measure was specifically constructed to assess negative problem orientation directly, other than as a subscale in a more global measure of problem-solving ability. The goal of the present study was to translate the French version of the Negative Problem Orientation Questionnaire (NPOQ), and to examine its psychometric properties. The sample consisted of 201 university students who completed 5 questionnaires assessing psychological distress, pessimism, components of problem-solving ability, and the NPOQ. A unitary factor structure was revealed, accounting for 54.8% of the variance. The NPOQ had excellent internal consistency, good test-retest reliability at five weeks, and demonstrated convergent and discriminant validity when measured against self-reported pessimism, depression, anxiety, and problem-solving ability. The findings suggest that the NPOQ is a measure with sound psychometric properties that will be a valuable tool in future research on problem orientation.

The ability to effectively solve problems has long been linked to competence in both the social and clinical literature (see D'Zurilla & Nezu, 1999; Tisdelle & St-Lawrence, 1986 for review). In fact, deficits in problem-solving ability have been identified in several mental health disorders, including generalized anxiety disorder (GAD) (Dugas, Gagnon, Ladouceur, & Freeston, 1998; Ladouceur, Blais, Freeston, & Dugas, 1998), depression (Marx, Williams, & Claridge, 1992), pathological gambling (Sylvain, Ladouceur, Boisvert, 1997), and posttraumatic stress disorder (Nezu & Carnevale, 1987). However, social problem solving, that is, the act of resolving problems that occur in the natural social environment, is comprised of several discrete steps (D'Zurilla & Maydeu-Olivares, 1995) that are not uniformly impaired in relation to psychopathology. Interestingly, deficits in ability are rarely associated with poor problem-solving skills. Rather, studies have identified negative problem orientation as either the primary or the sole component of problem solving where deficits are found (see D'Zurilla & Nezu, 1999, for a review).

The construct of problem orientation includes both positive and negative dimensions, which are considered distinct, albeit related processes (Maydeu-Olivares & D'Zurilla, 1996). Negative problem orientation has been defined as a disruptive cognitive-emotional set, or attitude, toward problems that includes perceived threat of problems to well-being, self-inefficacy or doubt over one's problem-solving ability, the tendency to be pessimistic about the outcome, and low frustration tolerance. Positive problem orientation, on the other hand, has been described as a constructive cognitive set reflecting perceived challenge, self-efficacy, and positive outcome expectancy. As it is the construct of negative problem orientation that has been uniquely linked to several

mental disorders, it therefore appears to be the primary variable of interest in terms of understanding poor problem-solving ability, particularly as it relates to psychological disorders.

Due to the importance of the construct, it is essential that negative problem orientation be properly assessed. The measurement of negative problem orientation is typically done via self-report, through the use of questionnaires. Although there exist measures of problem-solving confidence and personal control (e.g., Heppner & Petersen, 1982), the only questionnaire currently available for the specific assessment of negative problem orientation is the Social Problem-Solving Inventory - Revised (SPSI-R; D'Zurilla, Nezu, & Maydeu-Olivares, 1998). The 52-item SPSI-R is comprised of 5 subscales, one of which is the 10-item Negative Problem Orientation (NPO) subscale. Although the questionnaire has been well validated, administration of the SPSI-R is time-consuming due to the large number of items, and the actual assessment of negative problem orientation is relegated to a subscale within a more global measure of problem-solving ability. Moreover, negative problem orientation is described as a cognitive-emotional set, whereas positive problem orientation is solely a cognitive set. As such, the items from the positive orientation scale reflect beliefs (e.g., "whenever I have a problem, I believe that it can be solved"), in contrast to the items from the negative orientation scale, which primarily deal with emotional responses such as feeling frustrated, nervous, and discouraged (e.g., "I become depressed and immobilized when I have an important problem to solve"). Few items from the NPO subscale directly address pessimism about the outcome or self-inefficacy beliefs.

Due to the preponderance of emotionally loaded items in the NPO subscale of the SPSI-R, several problems arise. First, there is a discrepancy in the conceptualization of negative problem orientation in relation to positive problem orientation, since the former is considered cognitive-emotional, while the latter is cognitively-focused. In order for both constructs to represent divergent attitudes, it might be preferable to exclude the emotional aspect of negative problem orientation. Second, a general negative disposition toward problem solving may be entangled with negative responses to a particular problem. That is, negative problem orientation may be considered a set of relatively stable negative beliefs pertaining to problem-solving ability that *produces* cognitive, affective, and behavioural responses. D'Zurilla and Nezu (1999) noted that a negative orientation toward problems can lead to negative emotions, avoidance, increased worry, and a reduction in effort to solve problems, thereby differentiating negative problem orientation from its potential consequences on problem-solving ability. Optimal items on a negative problem orientation scale should reflect general negative beliefs, rather than the product of these beliefs. There is therefore a need for a questionnaire that uniquely measures negative problem orientation as a dysfunctional cognitive set.

Recently, a measure of negative problem orientation was developed in French (Gosselin, Pelletier, & Ladouceur, 2000, 2001). The Negative Problem Orientation Questionnaire (NPOQ) was devised to allow for the sole measurement of the construct. Items on the NPOQ were derived from a pool of statements generated by clinicians and researchers, and designed to reflect only the cognitive components of the general predisposition in negative problem orientation (perceived threat, self-inefficacy, and negative outcome expectancy). Items demonstrating face validity were selected by

committee, and an initial 21-item questionnaire underwent pilot testing and preliminary validation. Further research allowed for the development of a final 12-item version of the NPOQ (Gosselin et al., 2001). The measure displayed good internal consistency, and demonstrated convergent and discriminant validity. A one-factor solution was identified for the NPOQ, representing 48% of the variance. Due to the good psychometric properties of the French version of the NPOQ, an English version of the measure is warranted. The goal of the present study was therefore to translate the NPOQ into English, and examine the psychometric properties of the questionnaire.

The NPOQ was translated from French to English according to well-established criteria (see Vallerand, 1989). Two bilingual individuals each translated the NPOQ into English. Both translated versions were then back translated by two additional individuals without referring to the original French version. Both translated versions were then evaluated jointly by two researchers as to their concordance with the original French language NPOQ, and the intelligibility of each English language item. The best items from either translation were retained for the final English version of the NPOQ.

In order to evaluate the psychometric properties of the NPOQ, the measure was assessed for internal consistency, test-retest reliability, factor structure, and convergent and discriminant validity using measures of psychological distress and problem-solving ability. Several hypotheses were formulated for the present study. First, the NPOQ was expected to display excellent internal consistency and good test-retest reliability at five weeks. Second, a unitary factor structure was expected to emerge from a factor analysis of the NPOQ items. Third, it was expected that the NPOQ would demonstrate convergent validity by being highly related to the NPO subscale of the SPSI-R, as well as moderately

related to measures of pessimism, anxiety, and depression. The NPOQ was also expected to have a moderate negative relationship to optimism and the Positive Problem Orientation subscale of the SPSI-R, and to display discriminant validity by being unrelated to a measure of problem-solving skills. Fourth, it was expected that the NPOQ would maintain a unique relationship to measures of both anxiety and depression after controlling for pessimism. Specifically, the NPOQ was expected to be significantly related to pessimism, although not highly enough to be considered redundant.

Method

Participants and Procedure

Participants were 201 university students, 154 females and 47 males, with a mean age of 23.3 years (SD = 4.3) recruited from undergraduate courses at Concordia University. Students were approached during class time, and were requested to participate in the study. They were informed that the research dealt with thoughts and feelings associated with solving problems. They were explained that participation was strictly voluntary. Students who agreed to participate in the study were requested to fill out five questionnaires, and advised that completion of all measures would take approximately 20 minutes (See Appendix A for consent form). They were asked to answer every item, and told that there were no "right" responses to the questions. In addition, a group of 44 previously tested participants was approached five weeks later to complete one of the questionnaires, the NPOQ, for retest.

Measures

Negative Problem Orientation Questionnaire (NPOQ; Gosselin, Pelletier, & Ladouceur, 2000). The NPOQ is a 12-item measure that assesses negative problem

orientation, a dysfunctional cognitive set that includes the tendency to see problems as a threat, to doubt one's own problem-solving ability, and to be pessimistic about the outcome. Originally devised in French, the NPOQ was translated into English according to protocol described herein (see Appendix C for the French and English versions of the NPOQ). Participants rate each item on a 5-point Likert scale ranging from 1 ("not at all true of me") to 5 ("extremely true of me"), according to how they react or think when confronted with a problem. Sample items include "I see problems as a threat to my well-being" and "I often see problems as bigger than they really are". An initial psychometric evaluation of the French version suggested that the NPOQ is unifactorial, with excellent internal consistency ($\alpha = .90$), and good convergent and discriminant validity (Gosselin, Pelletier, & Ladouceur, 2001).

Social Problem-Solving Inventory- Revised Short Form (SPSI-R-SF; D'Zurilla, Nezu, & Maydeu-Olivares, 1998). The SPSI-R-SF is a 25-item short-form version of the SPSI-R, a questionnaire measuring social problem-solving ability (see Appendix D). Participants rate each item on a 5-point Likert scale according to how they deal with the problems in everyday life that are not immediately solvable. Although the total score is often calculated to obtain a measure of global social problem-solving ability, the items can be divided into 5 subscales: Positive Problem Orientation, Negative Problem Orientation, Rational Problem Solving, Impulsivity/ Carelessness Style, and Avoidance Style. The complete 52-item SPSI-R was not administered in the present study due to the length of the questionnaire and time constraints. Although the NPO subscale of the SPSI-R has a greater number of items than the SPSI-R-SF (10 vs. 5 items), the short-form version has shown evidence of good psychometric properties, and was therefore deemed

appropriate for use. The measure has adequate internal consistency (α = .79 to .83), and good test-retest reliability at 3 weeks, r = .74. The SPSI-R-SF also has demonstrated predictive, convergent, and discriminant validity (D'Zurilla, Nezu, et al., 1998). As no specific hypotheses were generated for Impulsivity/ Carelessness Style and Avoidance Style, neither subscale was included in the statistical analyses.

Extended Life Orientation Test (ELOT; Chang, Maydeu-Olivares, & D'Zurilla, 1997). The ELOT is a bidimensional measure comprised of 20 items that assesses positive and negative outcome expectancies (see Appendix D). The ELOT is an extended version of the Life Orientation Test (LOT; Scheier & Carver, 1985) that also includes several items taken from the Optimism and Pessimism Scale (OPS; Dember et al., 1989). The questionnaire consists of a 6-item Optimism scale, a 9-item Pessimism scale, and 5 filler items. Participants rate each item on a 5-point Likert scale. Sample items include "I always look on the bright side of things" and "I rarely count on good things happening to me". The ELOT has good internal consistency (α = .81 and .92 for the Optimism and Pessimism scales respectively), adequate test-retest reliability at 6 weeks (r = .73 for the Optimism scale, r = .84 for the Pessimism scale), as well as demonstrated discriminant validity (Chang et al., 1997).

Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988). The BAI is a measure of state anxiety consisting of 21 items that correspond to anxiety symptoms (see Appendix D). Participants rate each item on a 4-point Likert scale, indicating to what degree they were affected by each symptom over the past week. The measure has excellent internal consistency (α = .92), high test-retest reliability at one week (r = .75), and demonstrated convergent and discriminant validity (Beck et al., 1988).

Beck Depression Inventory - II (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21 item self-report instrument measuring the severity of depression in adults by endorsing depressive symptoms (see Appendix D). Participants are asked to choose from statements of increasing severity for each depressive symptom according to how they have been feeling over the past two weeks. The BDI-II has excellent internal consistency (α = .92 & .93), test-retest reliability at one week for an outpatient sample (r = .93), and demonstrated convergent and discriminant validity (Beck et al., 1996).

Results

Data were screened for univariate linearity, skewness, and kurtosis, as well as for singularity and multicollinearity. Linearity and kurtosis were normal, and three univariate outliers ($z > 3.29$) were deleted. Four measures showed a moderate positive skew, the BAI, the BDI-II, the NPOQ, and the NPO subscale of the SPSI-R-SF. Scores on these measures were corrected by square root conversion.

Means, Standard Deviations, and Gender Differences

Means and standard deviations for the measures under study are presented in Table 2.1. The mean score for the NPOQ was consistent with the score reported in the validation for the French version of the measure (M = 25.03, SD = 7.8; Gosselin et al., 2001). The mean score for women on the NPOQ was 25.45 (SD = 9.3), and the mean score for men was 22.60 (SD = 9.6). Although women reported higher scores on the NPOQ than men, a one-way between-subjects ANOVA identified no significant gender difference (F (1, 199) = 3.31, ns).

Table 2.1

Means and Standard Deviations for all Variables Under Study (N = 199)

Variable	Mean	Standard Deviation
BAI	16.72	11.87
BDI-II	11.67	9.44
Pessimism	21.14	6.85
Optimism	20.89	3.82
NPOQ	24.78	9.46
PPO	11.22	4.12
NPO	6.72	4.30
RPS	10.73	3.91

Note. BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory - II; Pessimism = Pessimism subscale of the Extended Life Orientation Test (ELOT); Optimism = Optimism subscale of the ELOT; NPOQ = Negative Problem Orientation Questionnaire; PPO = positive problem orientation subscale of the Social Problem-Solving Inventory - Revised- Short Form (SPSI-R-SF); NPO = negative problem orientation subscale of the SPSI-R-SF; RPS = rational problem-solving subscale of the SPSI-R-SF.

Reliability

The NPOQ displayed a high internal consistency ($\alpha = .92$). Corrected item-total correlations ranged from .62 to .74 (see Table 2.2), showing the quality of individual items. The measure also displayed a high test-retest reliability ($r = .80, p < .01$). A sub-sample of participants ($n = 44$) completed the NPOQ twice, the second administration having taken place five weeks subsequent to the first.

Factorial Validity

An initial principal components factor analysis was performed on the 12 NPOQ items. A scree plot was used to identify the number of factors that should be considered for extraction. Two factors initially emerged with eigenvalues greater than 1, specifically factor I had an eigenvalue of 6.58, and factor II had an eigenvalue of 1.08. Due to the marginal value of the second factor, a one-factor solution was subsequently investigated. In line with the statistical methods used for the French version of the NPOQ, a Maximum Likelihood factor analysis was conducted with only one factor extracted, accounting for 54.8% of the variance. The factor matrix is presented in Table 2.3. Item loadings ranged from .64 to .79.

Validity

In order to assess convergent and discriminant validity, correlation coefficients were calculated between the NPOQ and several other measures (see Table 2.4). In terms of the SPSI-R-SF subscales, the NPOQ had the strongest relationship with the Negative Problem Orientation subscale through a high positive correlation, as well as a moderate negative correlation with the Positive Problem Orientation subscale. The NPOQ was unrelated to the Rational Problem Solving subscale. The NPOQ also had a moderate

Table 2.2

Means, Standard Deviations, and Corrected Item-Total Correlations for NPOQ Items (N = 199)

No.	Item	*M*	*SD*	r_{corr}
1	I see problems as a threat to my well-being.	2.15	1.05	.62
2	I often doubt my capacity to solve problems.	2.02	.95	.73
3	Often before even trying to find a solution, I tell myself that it is difficult to solve problems.	1.81	.96	.65
4	My problems often seem insurmountable.	2.01	1.10	.74
5	When I attempt to solve a problem, I often question my abilities.	2.17	1.02	.74
6	I often have the impression that my problems cannot be solved.	1.87	1.07	.70
7	Even if I manage to find some solutions to my problems, I doubt that they will be easily resolved.	1.96	1.03	.67
8	I have a tendency to see problems as a danger.	1.76	1.03	.66
9	My first reaction when faced with a problem is to question my abilities.	1.92	1.06	.67
10	I often see my problems as bigger than they really are.	2.63	1.22	.69
11	Even if I have looked at a problem from all possible angles, I still wonder if the solution I decided on will be effective.	2.36	1.10	.67
12	I consider problems to be obstacles that interfere with my functioning.	2.06	1.14	.64

Note. r_{corr} = Corrected item-total correlations.

Table 2.3

Factor Loadings for NPOQ Items based on Maximum Likelihood Factor Analysis

No.	Item	Factor Loadings
1.	I see problems as a threat to my well-being.	.64
2.	I often doubt my capacity to solve problems.	.76
3.	Often before even trying to find a solution, I tell myself that it is difficult to solve problems.	.69
4	My problems often seem insurmountable.	.77
5	When I attempt to solve a problem, I often question my abilities.	.79
6	I often have the impression that my problems cannot be solved.	.73
7	Even if I manage to find some solutions to my problems, I doubt that they will be easily resolved.	.69
8	I have a tendency to see problems as a danger.	.67
9	My first reaction when faced with a problem is to question my abilities.	.72
10	I often see my problems as bigger than they really are.	.70
11	Even if I have looked at a problem from all possible angles, I still wonder if the solution I decided on will be effective.	.71
12	I consider problems to be obstacles that interfere with my functioning.	.65
	Eigenvalue	**6.58**

Table 2.4

Intercorrelations between the NPOQ and Study Measures (N = 201)

Variable	NPOQ	BAI	BDI-II	Opt	Pess	NPO	PPO	RPS
NPOQ	_	.53**	.64**	-.52**	.57**	.83**	-.39**	.08
BAI		_	.56**	-.25**	.40**	.48**	-.16*	.08
BDI-II			_	-.49**	.65**	.60**	-.34**	.04
Opt				_	-.67**	-.48**	.66**	.17*
Pess					_	.52**	-.48**	-.11
NPO						_	-.44**	.06
PPO							_	.47**
RPS								_

Note. NPOQ = Negative Problem Orientation Questionnaire; BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory - II; Opt = Optimism subscale of the Extended Life Orientation Test (ELOT); Pess = Pessimism subscale of the ELOT; NPO = negative problem orientation subscale of the Social Problem-Solving Inventory- Revised-Short Form (SPSI-R-SF); PPO = positive problem orientation subscale of the SPSI-R-SF; RPS = rational problem-solving subscale of the SPSI-R-SF.

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

negative correlation to the Optimism subscale of the ELOT, as well as a moderate positive correlation with the Pessimism subscale of the ELOT, the BAI, and BDI-II. In order to ensure that the NPOQ is distinct from the pessimism subscale, due to the inclusion of the pessimism construct within the definition of negative problem orientation, correlations between the NPOQ and the BAI and the BDI-II were conducted with the pessimism subscale partialled out. Correlations with the NPOQ remained significant for both the BAI ($r = .40, p < .01$) and the BDI-II ($r = .42, p < .01$).

Discussion

Overall, the hypotheses of the present study were confirmed. The English version of the NPOQ has excellent internal consistency and good test-retest reliability at 5 weeks, consistent with the description of problem orientation as a set of relatively stable schemas (D'Zurilla & Nezu, 1999). A one-factor structure for the measure was identified, reflecting a general predisposition for negative beliefs concerning problems and problem-solving ability. This finding is in line with the results found in the validation for the French version of the NPOQ.

As expected, convergent validity for the NPOQ was demonstrated. The measure was most highly correlated with the NPO subscale of the SPSI-R-SF, providing evidence that the NPOQ and the NPO subscale are both measuring highly similar constructs, despite the exclusion of emotionally-loaded items from the NPOQ. Measures of psychological distress were moderately correlated to NPOQ scores. These findings are also consistent with the validation results for the French measure, as well as validation research on the SPSI-R subscales (D'Zurilla, et al., 1998). The NPOQ also had a moderate relationship to pessimism, and a moderate, albeit smaller, inverse relationship

with optimism, as was found in previous research (Chang & D'Zurilla, 1996). In addition, the relationship between the NPOQ and the Pessimism subscale, although moderate, was not so high as to render negative problem orientation redundant. The NPOQ retained a moderate relationship to measures of psychological distress even after controlling for pessimism, indicating a unique contribution of negative problem orientation over and above that which can be attributed to pessimism.

The NPOQ also displayed discriminant validity. Scores on the questionnaire were unrelated to the Rational Problem Solving subscale of the SPSI-R-SF. Despite its focus on beliefs surrounding problems, problem orientation is distinct from the actual skills involved in social problem solving (D'Zurilla et al., 1998). In addition, the items demonstrated face validity by focusing solely on cognitive predispositions and attitudes, yet still maintaining significant associations with variables previously found to correlate with the NPO subscale of the SPSI-R.

At this time, the NPOQ appears to be a valid and reliable instrument for the assessment of negative problem orientation. Due to the small number of items included in the questionnaire, the NPOQ is a more time-saving method of assessing negative problem orientation than the lengthier SPSI-R. Moreover, by focusing exclusively on the cognitive components of the construct, the NPOQ may be deemed a more "pure" measure of negative problem orientation, reflecting general negative attitudes toward problem solving, without the addition of cognitive, affective, or behavioural consequences. As stated previously, negative problem orientation is often the primary problem-solving variable related to several psychological disorders, thereby justifying the need for a scale that focuses specifically on this aspect of social problem solving.

Despite these encouraging results, the present study remains a preliminary validation of the English version of the measure, and as such there exist a few limitations and future research directions of note. First, the absence of a gender difference on NPOQ scores was a surprising finding. Previous research has consistently found women to report significantly greater negative problem orientation than men (e.g., D'Zurilla, Maydeu-Olivares, & Kant,1998; Robichaud, Dugas, & Conway, 2003). The lack of a gender difference may be due to either the paucity of males relative to females in the participant pool, thereby reducing the statistical power of the test, or due to the modification of the NPOQ as a purely cognitive measure. Future testing of the NPOQ would benefit from a more equal distribution of participants according to gender. Second, it appears that negative problem orientation, and its modification into a more constructive orientation, can be an important aspect of therapeutic treatment. For example, research on problem-solving therapy for depression revealed that patients reported lower depression scores after termination when given a treatment that included a problem orientation component (Nezu & Perri, 1989). These findings suggest that the NPOQ may be beneficial both to clinical research and practice. As such, research is needed to assess the validity of the measure with clinical populations.

Subsequent research might also be directed toward further investigating the construct validity of the measure. The elements of negative problem orientation share conceptual similarity with broader personality concepts such as self-efficacy, and negative affectivity (or neuroticism). Although negative problem orientation was found to be distinct from pessimism, the additive contribution of several conceptually related variables might reduce the uniqueness of the construct, and should therefore be assessed.

Furthermore, the present study conceptualized a distinction for negative problem orientation between general predisposing attitudes and the consequences that might emerge in practice when confronted with social problems. Several questions can be examined from this contention. First, it is unclear whether the NPOQ, as a measure of general negative attitudes, would display incremental validity through the prediction of criterion variables above and beyond the contribution of the NPO subscale. Moreover, since there is currently no measure that solely assesses the consequences of a negative problem orientation, it might be of interest to develop a questionnaire with a focus on negative problem-solving responses. Finally, since problem-solving responses may be affective, cognitive, and behavioural, future studies might investigate whether there is evidence of specificity between negative problem orientation, resultant problem-solving responses, and different psychological disorders.

In sum, the present study has demonstrated the sound psychometric properties of the English version of the NPOQ, a measure of dysfunctional cognitive attitudes toward problem solving. These findings are in accordance with the validation research conducted on the French version of the measure. Future research might further investigate the construct validity of the measure, particularly in relation to variables that share conceptual similarity with negative problem orientation, in order to verify the distinctiveness of the construct. The present findings suggest that the NPOQ will prove to be a valuable tool in later investigations.

CHAPTER 3

Abstract

Negative Problem Orientation (Part II):

Construct Validity and Specificity to Worry

Negative problem orientation, a dysfunctional set of attitudes related to problem-solving ability, has been implicated as a process variable in several psychological disorders, notably depression and generalized anxiety disorder (GAD). The goal of the present study was two-fold: 1) to further examine the construct validity of a new measure of negative problem orientation, the Negative Problem Orientation Questionnaire (NPOQ), through its relationship to conceptually similar variables, and 2) to investigate the specificity of negative problem orientation to worry, the cardinal feature of GAD, compared to depression. The sample consisted of 148 university students who completed six questionnaires, the NPOQ and measures of worry, depression, pessimism, self-mastery, and neuroticism. Multiple hierarchical regressions revealed that when entered in the last step following demographic information and personality variables (pessimism, self-mastery, and neuroticism), the NPOQ accounted for 5.6% of the variance in worry scores compared to 1.6% of the variance in depression scores. It was concluded that the NPOQ shows evidence of construct validity, and that the process variable of negative problem orientation appears to have greater specificity to worry than depression. Implications for the understanding of worry and GAD are discussed.

Research into the role of problem solving on psychological distress suggests that negative problem orientation, one of 5 problem-solving steps identified by D'Zurilla and Goldfried (1971), is either the sole or primary problem-solving variable involved. Negative problem orientation refers to a dysfunctional cognitive set regarding social problems, and was originally described as a cognitive-emotional schema (see D'Zurilla & Nezu, 1999). A pure cognitive measure of negative problem orientation was recently constructed however, in order to disentangle negative cognitive, emotional, and behavioural responses from general negative beliefs surrounding social problem solving (see Robichaud & Dugas, 2005). In our current definition, negative problem orientation therefore consists of beliefs reflecting perceived threat of problems to well being, doubt concerning problem-solving ability, and the tendency to be pessimistic about the outcome.

In relation to the affective and anxiety disorders, negative problem orientation has consistently been linked to symptoms of depression (D'Zurilla, Chang, Nottingham, & Faccini, 1998), as well as to excessive worry in both clinical (Dugas, Gagnon, Ladouceur, & Freeston, 1998) and non-clinical populations (Dugas, Letarte, Rhéaume, Freeston, & Ladouceur, 1995). Problem-solving training as a therapeutic strategy has in fact been adopted as a treatment component for GAD (Dugas, 2002), and as a primary treatment goal for clinical depression (Nezu, Nezu, & Perri, 1989), both with a particular emphasis placed on targeting negative problem orientation. Moreover, in a dismantling investigation, treatment outcome for depression was found to be significantly greater when negative problem orientation was specifically targeted during problem-solving therapy (Nezu & Perri, 1989).

Despite the strength of the evidence however, the distinctiveness of negative problem orientation as a construct may potentially be called into question, as the defining components appear to share some conceptual similarity with the more global variables of pessimism, self-mastery, and neuroticism. Pessimism refers to the tendency to hold negative expectations about the future irrespective of one's personal ability, a concept that shares a conceptual link with the tendency to be pessimistic regarding the outcome of problem solving. Self-mastery shares common ground with negative problem orientation through its conceptual similarity with the tendency to doubt one's problem-solving ability, as it refers to individual expectations about one's ability to attain a desired outcome through personal influence. Pessimism and self-mastery therefore both reflect broad general outcome expectancies, although neither is specifically linked to problem-solving beliefs. It is nevertheless unclear whether the report of negative problem orientation is a product of generalized negative outcome expectancies, or the result of specific negative attitudes concerning social problem solving.

A similar argument can be made concerning the conceptual link between negative problem orientation and the more diffuse construct of neuroticism. Generally described as a stable personality trait that includes a broad range of negative moods, cognitions, and self-appraisals, neuroticism has been associated with feelings of self-doubt and pessimism (see Clark, Watson, & Mineka, 1994). Despite the logical possibility that all three components of negative problem orientation might be subsumed under the broad definition of neuroticism, no specific reference is made to problem solving. In addition, neuroticism includes several other factors unrelated to negative problem orientation, such

that whenever variables show a relationship to neuroticism, it might be difficult to extricate which aspects of neuroticism underlie a given effect.

The constructs of pessimism, self-mastery, and neuroticism present further difficulty for the distinctiveness of negative problem orientation in terms of their relationship to distress. Notably, pessimism, self-mastery, and neuroticism have been linked to symptoms of depression (Clark et al., 1994; Enns & Cox, 1997; Marshall & Lang, 1990), and theories have been advanced by Clark et al. (1994) and MacLeod (1994) contending that neuroticism and pessimism, respectively, are involved in GAD and worry report. No studies linking self-mastery to worry were found. It appears that not only do these personality variables share conceptual similarity with negative problem orientation, but they are also related to the report of distress, albeit particularly strongly to symptoms of depression. As such, it is unclear whether the relationship between negative problem orientation and psychological distress is distinct, or a by-product of the relationship between distress and the personality measures of pessimism, self-mastery, and neuroticism. Moreover, due to the greater evidence linking the personality measures to depression, as compared to the research on worry, it is plausible that the personality measures overlap with negative problem orientation to a greater extent for depression than for worry. That is, pessimism, self-mastery, and neuroticism may explain the relationship of negative problem orientation to depression, but not the relationship between negative problem orientation and worry.

The goal of the present study was therefore to further investigate the construct validity of a new measure of negative problem orientation by determining whether it was distinct from conceptually similar variables, and to examine whether the process variable

of negative problem orientation showed greater specificity to worry over depression, after controlling for pessimism, self-mastery, and neuroticism. In accordance with prior research, several hypotheses were formulated for the present study: 1) negative problem orientation was expected to be significantly associated with pessimism, self-mastery, and neuroticism, although not so highly as to be redundant; 2) it was postulated that negative problem orientation would be significantly related to both worry and depression; 3) it was hypothesized that although negative problem orientation would continue to predict both worry and depression scores after accounting for the personality variables, it would be a better unique predictor of worry than depression.

Method

Participants and Procedure

Participants were university students, 107 females and 41 males, with a mean age of 23.6 years (SD = 6.1) recruited from undergraduate courses at Concordia University. Students were approached during class time, and were requested to participate in the study (see Appendix A for consent form). They were informed that the research dealt with different aspects of worry, as well as general thoughts and feelings. They were explained that participation was strictly voluntary. Students who agreed to participate in the study were requested to fill out six questionnaires, and advised that completion of all measures would take approximately 20 minutes.

Measures

Negative Problem Orientation Questionnaire (NPOQ; Robichaud & Dugas, 2005). The NPOQ is a 12-item measure that assesses the dysfunctional cognitive set of negative problem orientation (See Appendix C). Participants rate each item on a 5-point

Likert scale, according to how they react or think when confronted with a problem. Sample items include "I see problems as a threat to my well-being" and "I often see problems as bigger than they really are". The NPOQ was translated from the original French version of the measure, which was found to display excellent internal consistency (α = .90), convergent and discriminant validity, and was unifactorial (Gosselin, Pelletier, & Ladouceur, 2001). An initial psychometric evaluation of the English version suggested that the NPOQ is also unifactorial, with excellent internal consistency (α = .92), high test-retest reliability (r = .80), and good convergent and discriminant validity (Robichaud & Dugas, 2005).

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ is a 16-item questionnaire that measures the trait-like tendency to worry (see Appendix D). The PSWQ is unifactorial, and shows good reliability (Davey, 1993) and validity (Meyer et al., 1990).

Center for Epidemiological Studies - Depression scale (CES-D; Radloff, 1977). The CES-D is a 20-item questionnaire designed to measure depressive symptomatology in the general population (see Appendix D). The CES-D has good reliability and validity (Radloff, 1977).

Life Orientation Test - Revised (LOT-R; Scheier, Carver, & Bridges, 1994). The LOT-R is a 10 item measure assessing generalized expectancies for positive and negative outcomes (see Appendix D). The measure is comprised of 4 filler items, 3 positively worded items, and 3 negatively worded items. After reversing the items worded in a negative direction, item scores were totaled to yield an overall optimism score. High

scores on the LOT-R indicate low pessimism, low scores indicate high pessimism. The LOT-R has adequate reliability and validity (Scheier et al., 1994).

Self-Mastery Scale (SMS; Pearlin & Schooler, 1978). The SMS is a 7-item measure assessing the extent to which an individual perceives a sense of personal control or mastery over life outcomes (see Appendix D). High scores on the SMS indicate high self-mastery. Basic psychometric properties of the SMS have been well established with community populations (Pearlin & Schooler, 1978).

NEO Personality Inventory - Five Factor Inventory (NEO-FFI; Costa & McCrae, 1989). The NEO-FFI is a 60-item measure assessing the five personality domains of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Only the neuroticism subscale of the NEO-FFI was used in the present study. The neuroticism subscale is comprised of 12 items used to assess a broad dimension of individual differences in the tendency to experience negative, distressing emotions, and to possess associated behavioural and cognitive traits (see Appendix D). The subscales for the NEO-FFI have demonstrated high reliability and validity (Costa & McCrae, 1989).

Results

As the NPOQ is a recently constructed measure, reliability indices for the questionnaire were computed. Items on the NPOQ displayed a high internal consistency ($\alpha = .91$), and corrected item-total correlations ranged from .55 to .74. In order to verify the factor structure of the measure, a factor analysis was conducted. In line with statistical analyses previously conducted on the NPOQ, a maximum likelihood factor analysis was performed. One factor was extracted with an eigenvalue of 6.24, accounting for 52% of

the variance. All items loaded onto the one factor, with loadings ranging from .57 to .79. These results are consistent with the findings from prior research conducted on the measure (Gosselin et al., 2001; Robichaud & Dugas, 2005).

In order to determine whether scores on the NPOQ were related to measures of symptom distress and conceptually similar process variables, zero-order correlations were calculated (see Table 3.1). The NPOQ displayed a strong positive correlation to scores on both symptom measures. Although the correlation between scores on the NPOQ and the CES-D ($r = .63$) was higher than the correlation between scores on the NPOQ and the PSWQ ($r = .55$), the difference was not significant when assessed through Fisher's r to z transformation ($z = 1.11$, ns).

The NPOQ was also highly related to conceptually similar process measures. The NPOQ was positively correlated with scores on the neuroticism subscale of the NEO-FFI, and negatively correlated with scores on the SMS and the LOT-R. As low scores on the SMS and the LOT-R are indicative, respectively, of low self-mastery and a pessimistic outcome expectancy, the correlations to the NPOQ are in the expected direction.

Owing to the potential overlap between the NPOQ and measures of pessimism, neuroticism, and self-mastery in terms of their relationship to distress, hierarchical regressions were conducted to determine whether the NPOQ was a distinct process variable to the prediction of worry and depression scores. In the first regression, worry symptom scores on the PSWQ were the dependent variable. Age and gender were entered in the first step of the regression, and significantly predicted 6.9% of the variance in PSWQ scores. The SMS, the LOT-R, and the NEO-FFI (neuroticism subscale) were entered in the second step, and together contributed a significant amount of variance,

Table 3.1

Zero-Order Correlations Among Study Measures (N = 147)

Measures	NPOQ	PSWQ	CES-D	LOT-R	SMS	NEO-ns
NPOQ	_	.55***	.63***	-.55***	-.64***	.67***
PSWQ		_	.45***	-.30***	-.39***	.58***
CES-D			_	-.57***	-.64***	.68***
LOT-R				_	.59***	-.54***
SMS-					_	.67***
NEO-ns						_

Note. NPOQ = Negative Problem Orientation Questionnaire; PSWQ = Penn State Worry Questionnaire; CES-D = Centre for Epidemiological Studies – Depression scale; LOT-R = Life Orientation Test – Revised, measure of optimism; SMS = Self-Mastery Scale; NEO-ns = NEO Five Factor Inventory, neuroticism subscale.

*$p < .05$; ** $p < .01$, *** $p < .001$.

32.1%. Beta weights indicated that only scores on the NEO-FFI (neuroticism subscale) emerged as a significant predictor. NPOQ scores were then entered in the final step, and were found to contribute an additional, and significant, 5.6% to the prediction of PSWQ scores (see Table 3.2).

A second regression was conducted with depression symptom scores on the CES-D as the dependent variable. The sets entered in the second regression were identical to the first. Age and gender were found to significantly predict 3.3% of the variance in depression scores on the CES-D. Scores on the process variables (SMS, LOT-R, NEO-FFI-neuroticism subscale) also provided a significant contribution, accounting for 52.5% of the variance. Beta weights indicated that only scores on the NEO-FFI (neuroticism subscale) and the SMS provided a significant contribution to the prediction of CES-D scores. NPOQ scores were then entered in the final step, and were found to contribute a small, yet significant amount of prediction to CES-D scores, 1.6% (see Table 3.3).

As NPOQ scores predicted a greater percentage of unique variance in worry scores compared to depression scores (5.6% vs. 1.6%), analysis of covariance (ANCOVA) procedures were conducted to further investigate the specificity of NPOQ to worry and depression. A median split was calculated for PSWQ worry scores in order to create high and low worry groups. The same calculation was also conducted on CES-D depression scores, creating high and low depression groups. ANCOVA procedures were conducted with each personality process variable entered in isolation as a covariate.

For all ANCOVA procedures, scores on the NPOQ were the dependent variable, either worry group or depression group was the independent variable, and the personality variables of pessimism, self-mastery, and neuroticism were each the covariate in turn. In

Table 3.2

Summary of Hierarchical Multiple Regression Analysis for Variables Predicting Scores on the PSWQ (N = 143)

Variables	ΔR^2	*B*	*SE B*	β
Step 1	.069**			
Age		.00	.16	.01
Gender		-6.45	1.94	-.22***
Step 2	.321***			
LOT-R		.00	.27	.02
SMS		.24	.26	.09
NEO-ns		.66	.16	.40***
Step 3	.056***			
NPOQ		.52	.14	.35***

Note. PSWQ = Penn State Worry Questionnaire; LOT-R = Life Orientation Test – Revised, measure of optimism; SMS = Self-Mastery Scale; NEO-ns = NEO Five Factor Inventory, neuroticism subscale; NPOQ = Negative Problem Orientation Questionnaire.
*$p < .05$; ** $p < .01$, *** $p < .001$.

Table 3.3

Summary of Hierarchical Multiple Regression Analysis for Variables Predicting Scores on the CES-D (N = 142)

Variables	ΔR^2	*B*	*SE B*	β
Step 1	.033			
Age		-.14	.10	-.08
Gender		1.76	1.18	.09
Step 2	.525***			
LOT-R		-.25	.17	-.12
SMS		-.35	.16	-.18*
NEO-ns		.43	.10	.38***
Step 3	.016*			
NPOQ		.19	.09	.19*

Note. CES-D = Centre for Epidemiological Studies – Depression scale; LOT-R = Life Orientation Test – Revised, measure of optimism; SMS = Self-Mastery Scale; NEO-ns = NEO Five Factor Inventory, neuroticism subscale; NPOQ = Negative Problem Orientation Questionnaire.

*$p < .05$; ** $p < .01$, *** $p < .001$.

the first series of ANCOVAs, scores on the SMS were the covariate. When worry group was the independent variable, a significant group difference emerged [F (1, 142) = 27.16, $p < .01$, $\eta^2 = .16$], such that individuals in the high worry group continued to report significantly higher scores on the NPOQ, after controlling for self-mastery. When depression group was the independent variable, no significant group differences emerged [F (1, 141) = 1.46, ns]. A similar pattern emerged in the second series of ANCOVAs, when scores on the NEO-FFI-neuroticism subscale were the covariate. Between-group differences on the NPOQ were found with worry group as the independent variable [F (1, 143) = 9.75, $p < .01$, $\eta^2 = .06$], but not with depression group as the independent variable [F (1, 142) = 1.35, ns]. In the final series of ANCOVA procedures, scores on the LOT-R were entered as the covariate. Significant between group differences emerged according to both worry group [F (1, 142) = 26.52, $p < .01$, $\eta^2 = .16$] and depression group [F (1, 141) = 10.36, $p < .01$, $\eta^2 = .07$], indicating that scores on the NPOQ were significantly higher in both the high worry and high depression groups after controlling for pessimism.

Discussion

Overall, the hypotheses for the present study were confirmed. In terms of construct validity, the findings were as expected. The NPOQ was significantly associated with pessimism, self-mastery, and neuroticism, and the correlations between the personality measures and the NPOQ were in the moderate range, providing evidence for the distinctiveness of the NPOQ from conceptually related constructs. These results, which demonstrate convergent validity for the NPOQ, were also found with the original NPO subscale of the SPSI-R (Chang & D'Zurilla, 1996).

The hypothesis that the NPOQ would be significantly related to measures of psychological distress was also confirmed, as well as the hypothesis that the measure would maintain a significant relationship to distress after partialing out pessimism, self-mastery, and neuroticism. These findings not only provide further empirical support for the construct validity of the measure, but they also illustrate the relevance of poor attitudes toward problem solving to the report of worry and depression. That is, the relationship of negative problem orientation to distress may be due to the negative problem-solving beliefs in a negative orientation, rather than to a manifestation of more generalized negative expectancies, as is reflected in the report of pessimism, self-mastery, and neuroticism. This finding is echoed in self-efficacy research, wherein perceptions of ability, independent of actual ability, differ according to the specific skill involved (Bandura, 1997).

Whether the specificity of negative problem orientation to distress differed according to symptom type (i.e., worry or depression), was also investigated in the present study. Notably, the hypothesis that negative problem orientation would display greater specificity to worry than to depression was confirmed. After statistically controlling for all three personality variables, the NPOQ predicted a greater percentage of the variance in worry scores than in depression scores. Moreover, when worry and depression scores were each separated into high-low groups, negative problem orientation differentiated between high and low worriers after pessimism, self-mastery, and neuroticism were each covaried out in turn. Negative problem orientation was not found to significantly distinguish between the high and low depression groups following covariation of neuroticism and self-mastery, although significant group differences were

found to emerge after controlling for pessimism. This last finding is in line with prior research, however, as Marshall and Lang (1990) found self-mastery to be a better predictor of depression than pessimism, inasmuch as negative outcome expectations based on perceptions of personal deficits in ability (i.e., self-mastery) were a better predictor of depression than more generalized negative expectations regardless of personal intervention (i.e., pessimism).

Overall, these results suggest that although negative problem orientation is associated with both worry and depression, the specific relationship of negative problem orientation might differ according to symptom type. For depression, the relationship to negative problem orientation may be more of a by-product of the relationship between depression and the personality variables, such that negative problem orientation reflects a particular cognitive manifestation of the more generalized negative thinking characteristic of depression. For worry, however, it appears that the relationship to negative problem orientation may be more distinct. Worriers may be less likely to hold generalized negative thoughts, since low self-mastery and pessimism were not significant predictors of worry in the regression. Instead, the results suggest that negative self-efficacy beliefs and appraisal of outcomes centered around problem-solving ability are especially characteristic of worry. The specific relevance of a negative problem orientation to worry is further corroborated by the fact that negative problem orientation continued to predict worry scores after taking neuroticism into account. Eysenck and Eysenck (1975) originally described the general character of a neurotic individual as a worrier, constantly preoccupied with what might go wrong, such that a significant overlap would necessarily be expected between worry and neuroticism. Despite this

however, negative problem orientation continued to significantly predict worry, suggesting a specific association between negative problem orientation to worry.

If negative problem orientation is in fact a process variable that has greater specificity to worry than depression, then the question of why this finding would emerge can be posed. Research has not only consistently identified an association between negative problem orientation and depression, but deficits in actual social problem-solving ability have been linked to depression as well (see D'Zurilla & Nezu, 1999), suggesting a specific link between both variables. However, the nature of worry has long been described as a thwarted attempt at problem solving, wherein worry represents the attempt to prevent or avoid potentially negative future events (Borkovec, Robinson, Pruzinsky, & DePree, 1983). Worry in general tends to reflect concern over uncertain future events, whereas depression is most strongly associated with a focus on ruminations related to the past (Nolen-Hoeksema, 1991). As social problems necessarily involve uncertainty in the future, then apprehension about the threatening nature of problems, and one's own ability to deal with them, may be more in line with worry than depression as a specific concern. Moreover, previous research has linked worry to intolerance of uncertainty (Dugas, Gosselin, & Ladouceur, 2001) and emotional avoidance (Borkovec & Hu, 1990). Since the outcome of problem solving is not only uncertain but potentially emotionally arousing as well, both processes may be activated in worriers when confronted with social problems. As a result, problems become something to be avoided, hence they are viewed as threatening.

Although the present findings suggest an important role for negative problem orientation in the understanding of worry, there are several limitations and future

directions that can be addressed. One limitation pertains to the inclusion of the NEO-FFI as a measure of neuroticism. Although the measure has been used in several studies and is well validated, there are several other measures currently used in the clinical and personality literature, with no general consensus as to what measure of neuroticism is most appropriate in psychological investigations. A different pattern of results might have emerged if alternate measures were used, such as measures of negative affectivity or trait anxiety. Future studies might also benefit from the use of other measures of personality to establish whether the specificity of negative problem orientation to worry is a consistent finding.

Another limitation was the sample under study. Since it was comprised of undergraduate students, the report of depression and worry was in the non-clinical range. As a consequence, despite the encouraging results in the present research, the generalizability of findings to both community and clinical samples is unclear. Future research might therefore investigate the specificity of negative problem orientation in a clinical population. Moreover, although the present findings suggest a greater role for negative problem orientation in worry than in depression, it would be of interest to compare the specificity of negative problem orientation to clinical worry and GAD compared to other anxiety disorders.

In sum, the present study suggests that the NPOQ is a valuable tool in the measurement of negative problem orientation, with evidence of the measure's construct validity. Moreover, the current findings suggest that the process of negative problem orientation may be particularly relevant to the continued study of worry, as both variables appear to share a unique and specific relationship. Finally, future investigations into the

relationship between negative problem orientation and clinical worry may well further our understanding of the role of problem-solving beliefs in the etiology of psychological disorders such as GAD.

Abstract

The Role of Intolerance of Uncertainty in Problem-Solving Ability

Problem-solving ability has typically been unrelated to worry and generalized anxiety disorder (GAD) when assessed via self-report or interview, despite a longstanding conceptual link in the literature. Our contention is that the relationship between GAD and problem solving has not been empirically determined to date because of 1) a focus on symptom measures like worry rather than underlying cognitive processes as the locus of potential problem-solving deficits, and 2) a measurement issue, wherein popular self-report and interview procedures measure knowledge of skills rather than actual ability and do not consider the impact of personal relevance on the problem-solving process. Intolerance of uncertainty, a key process involved in GAD, was predicted to play a significant role in the relationship between anxiety and problem solving. The goal of the present study was to assess problem-solving performance among individuals high and low in intolerance of uncertainty according to both the relevance of the problem and emotional state (anxiety, depression). Sixty-two participants completed a novel problem-solving interview for both a hypothetical and a personal problem, as well as measures of anxiety, depression, and problem solving. Correlations revealed that deficits in the initial stages of problem solving were associated with anxiety, whereas more elaborative problem-solving stage deficits were related to depression. These findings emerged solely among the high intolerance of uncertainty group and for the personally relevant problem. Implications are discussed in terms of information processing and the context-specific nature of problem-solving performance.

The construct of problem solving has shared a conceptual link with generalized anxiety disorder (GAD) since the inclusion of excessive worry as the cardinal feature of GAD in the DSM-IV (APA, 1994). Beginning with early research on the nature of worry, problem solving was actually included in working definitions, with the contention that "the worry process represents an attempt to engage in mental problem solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes" (Borkovec, Robinson, Pruzinsky, & DePree, 1983, p. 10). Moreover, researchers have conjectured that pathological worry exacerbates the problem-solving process, by leading individuals to catastrophize and ruminate about problems instead of solving them (Davey, 1994a; Mathews, 1990; Vasey & Borkovec, 1992). Indeed, in a successful cognitive-behavioral treatment package for GAD, problem-solving training is included as one of the primary treatment components (Dugas et al., 2003; Ladouceur et al., 2000). Although it was included in the protocol to address negative problem orientation, a set of dysfunctional attitudes about problem-solving, the problem-solving training component of treatment devotes as much time to the mastery of problem-solving skills as it does to improving problem orientation, and research suggests that this component is an integral part of successful treatment outcome (Provencher, Dugas, & Ladouceur, 2004).

Despite the apparent association between impaired problem-solving ability and GAD, research findings to date have not substantiated this relationship. Using worry as the measure of interest, studies have repeatedly found no relationship between trait worry and problem-solving skills. This finding has emerged with both self-report measures of skills (Belzer, D'Zurilla, & Maydeu-Olivares, 2002; Dugas et al., 1995; Dugas et al.,

1997; Ladouceur et al., 1998; Robichaud & Dugas, 2005), as well as with a popular interview for the assessment of problem solving (Davey, 1994b). Instead, it is negative problem orientation and poor problem-solving confidence that have consistently been found to predict worry scores, suggesting that any impairments in problem-solving ability among high worriers and individuals with GAD are the result of their poor perceptions of ability, rather than their actual skills level, which appears to be equivalent to that of low or moderate worriers.

Despite these null results in terms of problem-solving skills, it is nevertheless our contention that GAD may in fact be associated with impaired problem-solving ability. However, if such a relationship exists, the reason for a lack of findings substantiating this hypothesis needs to be addressed. It can be postulated that the problem is two-fold: First, the focus on symptoms such as worry to identify a relationship between GAD and problem-solving ability, rather than on underlying cognitive processes, might explain the current absence of corroborating findings. Second, popular measures of problem solving might not accurately assess problem-solving skills. The rationale for these arguments will be elaborated upon herein.

GAD, Intolerance of Uncertainty, and Problem Solving

As noted previously, problem-solving skills have been found to be unrelated to worry scores. Increasingly however, research has begun to investigate the cognitive processes that might play a causal role in the development of GAD-related worry. Within this line of study, intolerance of uncertainty has emerged as a key construct. Intolerance of uncertainty refers to a dispositional characteristic resulting from a set of fundamental beliefs about uncertainty and its implications (Dugas, Savard, et al., 2005). Broadly

speaking, intolerance of uncertainty affects how an individual perceives, interprets, and responds to uncertain situations on a behavioural, cognitive, and emotional level. Individuals who are intolerant of uncertainty believe that uncertainty is stressful and upsetting, that being uncertain about the future is unfair, that unexpected events are negative and should be avoided, and that uncertainty interferes with one's ability to function. It has been found to display a strong and specific relationship to worry (Buhr & Dugas, 2002; Dugas, Gosselin, & Ladouceur, 2001; Dugas et al., 1997), is significantly greater among GAD patients than all other anxiety disorder patients (Ladouceur et al., 1999), and predicts changes in worry over the course of treatment for GAD (Dugas & Ladouceur, 2000). Recent findings suggest that intolerance of uncertainty may be a more sensitive measure than worry when studying how individuals process and respond to information in their daily lives. Specifically, Dugas, Hedayati, and colleagues (2005) found that individuals high in intolerance of uncertainty were more likely to interpret ambiguous information as threatening than those low on intolerance of uncertainty. Moreover, it was found that the tendency to interpret ambiguous information as threatening was more highly related to intolerance of uncertainty than to anxiety, worry, or depression. As such, intolerance of uncertainty may be a more appropriate measure when studying potential deficits in problem-solving ability due both to its greater sensitivity in identifying threat appraisals and its inherent relationship to the problem-solving process. That is, given that social problems are daily life problems for which there is no immediately apparent solution and the outcome is necessarily uncertain, individuals high in intolerance of uncertainty would be expected to interpret such problems as more threatening.

According to cognitive theories of information processing, this increased tendency to interpret social problems as threatening would be expected to lead to impairments in problem-solving ability. Specifically, if intolerance of uncertainty can be viewed as an acutely sensitive dispositional characteristic that is activated by the uncertainty inherent in social problems, the resultant threat appraisal would lead individuals to selectively attend to the threatening elements of a situation, and subsequently overestimate the magnitude of the threat and engage in compensatory self-protective responses such as avoidance that block more constructive or reflective modes of thinking (Beck & Clark, 1997). Yet, a guiding principle of effective problem solving is that it is a rational and effortful process, wherein avoidance of certain stages of problem solving, or the problem-solving process altogether, would fail to result in a successful resolution of the problem situation (D'Zurilla & Nezu, 1999). As such, the relationship between GAD-related worry and impairments in problem-solving ability may occur *via* intolerance of uncertainty.

Moreover, expected deficits in problem solving might not be uniform across all stages, but rather constrained to specific steps within problem solving, according to the emotional state experienced at the time. The construct of problem-solving skills is comprised of six discrete steps originally formulated by D'Zurilla and Goldfried (1971) and later expanded upon by D'Zurilla and Nezu (1999), and includes problem definition, goal formulation, generation of alternatives, decision-making, solution implementation, and solution verification. Research on problem-solving using an interview format found that individuals with either an anxiety disorder diagnosis or major depression appeared to have greater problem-solving difficulties than non-clinical controls, however the clinical

groups showed impairments at different stages of the problem-solving process (Marx, Williams, & Claridge, 1992). Depressed patients experienced difficulty with the earlier cognitive stages of problem solving (i.e., generating effective solutions), whereas anxious individuals were more impaired at later behavioural stages of problem-solving (i.e., implementation of a chosen solution). This finding is in line with early theories of worry and problem solving, where it was anticipated that worriers would be adept at defining problems and generating solutions, but impaired at the implementation stage (Borkovec, 1985; Mathews, 1990). As a consequence, an individual's dispositional characteristics and given emotional state may impact on problem-solving performance, such that the juxtaposition of high intolerance of uncertainty and emotional state (i.e., anxiety and depression) can be expected to lead to stage-specific deficits in problem-solving.

The Measurement of Problem-Solving Ability

Another difficulty in the study of social problem solving and GAD involves the measures currently used for the assessment of problem-solving skills. The majority of research studies have relied upon one of three measures, namely the Means-End Problem-Solving inventory (MEPS; Platt & Spivack, 1975), the Problem Solving Inventory (PSI; Heppner, 1988), and the Social Problem-Solving Inventory – Revised (SPSI-R; D'Zurilla et al., 1998). Both the SPSI-R and the PSI are self-report instruments that include scales reflecting problem-solving styles (e.g., avoidance) and problem-solving self-appraisals (e.g., poor confidence in ability). In addition, the SPSI-R includes the Rational Problem Solving (RPS) scale that is comprised of items designed to assess each of the problem-solving steps. The RPS is assumed to measure effective use of each of the steps by asking participants to self-report on items such as "When I am trying to

solve a problem, I often think of different solutions and then try to combine some of them to make a better solution" and "When making decisions, I consider both the immediate consequences and long-term consequences of each option". However, self-efficacy research suggests that individuals may not be able to accurately report on their skills, as perceptions of ability are often unrelated to actual ability (Bandura, 1997). Moreover, reported deficits in problem-solving ability assessed via self-report have only emerged among populations with severe psychopathology (see Tisdelle & St. Lawrence, 1986 for a review), suggesting that most individuals without notable psychiatric difficulties are aware of the problem-solving steps and endorse them accordingly, regardless of their actual problem-solving abilities. As a consequence, self-report questionnaires of problem-solving skills such as the RPS subscale may be measuring awareness and knowledge of the problem-solving steps, rather than proficiency with them.

The validity of the MEPS as a measure of problem-solving ability has also been called into question. Using an interview format, the MEPS does not rely on self-report to obtain a score of problem-solving performance, as participants are given hypothetical problems and a desired conclusion, and are asked to describe the steps they would use to achieve the stated end. However, scores on the MEPS are derived from the number of relevant means generated (i.e., number of discrete steps that will lead to the desired end), such that not all of the problem-solving steps described by D'Zurilla and Nezu (1999) are assessed. In addition, interview answers can be difficult to interpret owing to responding discrepancies according to whether it is presented in a 2nd or 3rd person format, as well as its presentation to participants as a test of problem solving or a test of "imagination" (House & Scott, 1996). In fact, when Marx and colleagues (1992) used the MEPS to

assess the relationship between problem-solving and depression, a different pattern of results emerged when participants were asked to solve their own problems, albeit retrospectively, as opposed to hypothetical problems.

In line with this finding, Beck and Clark's (1997) cognitive theory of anxiety asserts that the initial processing of information is an automatic categorization of stimuli as threatening or not depending on the valence or personal relevance of the situation. In terms of problem-solving, intolerance of uncertainty would be more likely to trigger a threat appraisal when a problem has personal relevance to the individual, as opposed to a hypothetical problem where no personal negative consequences would be expected to occur. Given that the MEPS interview uses hypothetical problems in the assessment of skills, a threat appraisal is unlikely to be activated during problem solving, thereby masking any potential difficulties that might emerge when individuals are confronted with self-relevant problems. Taken together, these findings suggest that the current measures used most often in problem-solving research might not be appropriate for the assessment of actual problem-solving skills.

Current Study

As such, the goal of the present study was to address these issues in order to better understand the relationship between intolerance of uncertainty, emotional state, and problem-solving ability through the use of a novel interview that required participants to answer questions related to the six problem-solving steps. Moreover, in order to extricate whether the personal relevance of a problem had an impact on problem-solving ability, participants completed the interview for both a self-relevant problem and an other-relevant (hypothetical) problem.

Three hypotheses were devised for the present study: First, in accordance with prior findings, it was hypothesized that emotional state would differentially impact upon problem-solving performance according to level of intolerance of uncertainty. Specifically, among individuals high in intolerance of uncertainty, it was predicted that depression scores would be negatively correlated with scores on the generation of alternatives step, and anxiety scores would be negatively correlated with scores on the solution implementation and verification steps. Among individuals low in intolerance of uncertainty, emotional state and problem-solving scores were not expected to be correlated. Second, as cognitive theories of information processing states that threat appraisals are only activated when situations have personal relevance, it was hypothesized that the correlation between emotion and problem solving scores would not emerge for the other-relevant hypothetical problem irrespective of level of intolerance of uncertainty. Third, it was predicted that scores on the problem-solving steps would be correlated with some of the subscales of the SPSI-R, as well as a measure of the cognitive aspects of negative problem orientation, the Negative Problem Orientation Questionnaire (NPOQ; Robichaud & Dugas, 2005). As the SPSI-R contains subscales related to impulsive, careless, and avoidant problem-solving styles, interview scores on the problem-solving steps were expected to be negatively correlated to these scales. Similar results were expected for the NPOQ, as it includes the tendency to view problems as threatening and to doubt one's problem-solving ability, all of which might impact on problem-solving scores. In a related vein, it was predicted that both the problem-solving style subscales of the SPSI-R and the NPOQ would be more highly correlated with the problem-solving steps at high levels of intolerance of uncertainty than low levels, as

threat appraisal activation was expected to increase the tendency to use negative problem-solving styles. Finally, given the contention that the RPS subscale may not accurately measure problem-solving skills, it was expected to be uncorrelated with interview-based problem-solving scores.

Method

Participants

A total sample of 72 undergraduate university participants, 53 women and 19 men, were tested in this study. Ten participants were used for pilot testing and refinement of scoring criteria, resulting in a final sample of 62 participants (45 women, 17 men) with a mean age of 23.8 years (SD = 5.4). Students who had participated in previous research (albeit unrelated to the current study) for the Anxiety Disorders Laboratory were contacted, and requested to participate in an interview study on problem solving (see Appendix A for consent form). Students who agreed to participate were asked to complete an interview and a battery of questionnaires, and advised that the study would take approximately 90 minutes. Following testing, participants were debriefed as to the purpose of the study, and provided with a manual on effective social problem solving as a thank you for their participation.

Procedure

Problem-solving interview

Development. Open-ended questions were devised to address all six of the problem-solving steps according to problem-solving criteria outlined by D'Zurilla and Nezu (1999). Following the development of an initial interview protocol, each question was refined through pilot testing and team research meetings in order to arrive at clear

and easily comprehensible questions. Sample questions included "How would you define what exactly the problem is? If you had to give a clear definition of what the problem is, what would you say?" (problem definition step), and "How would you know whether the solution was working or not? In other words, what would you need to check on or keep tabs on in order to know that the problem was solved?" (solution verification step). In order to further clarify the interview questions, an illustrative example was provided at each step, using a hypothetical problem. Participants were presented with a "baseball player's problem" wherein the protagonist wanted to help his team win a baseball championship, however his poor hitting ability was serving as the primary obstacle. The description of the sample problem included emotional consequences ("I feel like a failure") and irrelevant information ("a cash prize"), and was designed to be an idiosynchratic conflict that would be unlikely to reflect the typical problem described by participants (see Appendix E for problem-solving interview).

As one of the objectives of the study was to contrast problem-solving ability for self vs. other-relevant problems, a hypothetical problem was devised for use in the interview (see Appendix F). This other-relevant problem dealt with a protagonist's inability to find a long-term romantic partner, with the primary obstacle being a difficulty in meeting individuals with like-minded relationship goals. Emotional consequences ("feeling lonely and depressed") and irrelevant information (e.g., age of the protagonist) were included in the problem description, and the gender of the protagonist was reversed according to the participant (i.e., a male protagonist for a female participant) in order to reduce any personal relevance of the problem.

Administration. To ensure consistency in testing, all participants were interviewed by the first author. They were provided with definitions for the concepts of problems and solutions, including the notion that problems can be chronic and ongoing, can feel confusing and stressful, and typically need to be dealt with efficiently in order for an individual to function well in daily life. In addition, participants were explained that solutions for these types of problems can be varied, and that the best solution can depend on many factors. The interviewer subsequently read the other-relevant "relationship" problem, and provided participants with a 5-point problem severity rating scale (from 0 "no problem" to 4 "extreme problem"), indicating that the other-relevant problem would most likely receive a 3 on the scale ("important problem") (see Appendix G for severity scale). Participants were then asked to generate and briefly describe a current unsolved problem they were experiencing that would merit the same severity rating. Prior to beginning the interview, participants were told that they would be asked specific questions about how to solve both problems, reminded that problem-solving is a complex process, and encouraged to think about each question and take their time before answering. Participants were also informed that after every question they would receive a prompt for additional information (i.e., "is there anything else you would like to add"), however they were advised that this did not presuppose any wrong or incomplete answers, but rather provided them with the opportunity to think further about the question if needed.

In order to address practice effects, the order of presentation of problems was counterbalanced, with half the participants receiving the other-relevant problem first, and half beginning with the self-relevant problem. Prior to answering interview questions for

the other-relevant problem, participants were to imagine that they were being asked to solve the problem, but to keep in mind that this was not their problem. All interviews were audio-recorded.

Scoring. To allow for scoring, two separate coders identified the primary conflict and obstacle for each problem. If the problem was out of the individual's direct control (e.g., parents arguing constantly), the controllable aspects of the problem (i.e., emotion-focused coping) were identified as the primary conflict (e.g., what can I do so that my parents' problems no longer have an emotional impact on me?). After all problems were reviewed for identification, any discrepancies in coding were discussed between the two coders in order to arrive at agreed upon problem identification criteria.

Scoring criteria were devised for all six steps of problem solving, and were developed based on the steps for effective problem solving determined by D'Zurilla and Nezu (1999) (see Appendix H for scoring criteria). For example, an answer for the generation of alternatives question was scored highly if it satisfied the criteria of quantity (i.e., over 12 solutions generated), quality (i.e., practical solutions related to the problem, stated in specific behaviours, inclusion of creative or "silly" solutions), and variety (i.e., different types of solutions). The scoring protocol was subsequently refined through team research meetings. Two independent coders were trained in the use of the scoring protocol, using the responses from the first 10 participants for pilot testing and enhanced concordance between raters. Each question for both self and other-relevant problems received a score ranging from 0 to 8, with higher scores reflecting greater ability for that particular step.

Interview integrity. In order to ensure that participants received the same instructions throughout the interview, as well as to determine whether any drift in the interview protocol occurred over time, an integrity check was performed (see Appendix I for integrity check grid). Ten audiotapes were randomly chosen from both the first and the last 31 participants, and were scored for 1) adherence to all major interview questions and prompts; 2) deviations from the script in terms of additional information provided to participants. Interview integrity for adherence to the protocol was 99.67% for the total sample. Deviations from the script fell under 2 categories, benign encouragement statements (i.e., "that's a good problem") and provision of clarification for interview questions. Both deviations occurred equally among scored interviews in each of the 2 groups, for a total of 16 encouragement statements and 14 clarification requests. Despite the frequency of these responses, no deviations that included encouragement regarding interview answers (i.e., "that's a good solution") were provided, nor were additional examples or alternate wording used when providing clarification.

Measures

A battery of questionnaires were administered subsequent to the interview, including:

Intolerance of Uncertainty Scale (IUS; French Version: Freeston et al., 1994; English translation: Buhr & Dugas, 2002). The IUS is a 27-item self-report measure that reflects the beliefs that unexpected events are negative and should be avoided, and that uncertainty is unfair, stressful, and leads to the inability to act (see Appendix D). The English version of the IUS displays excellent internal consistency ($\alpha = .94$), good test-retest reliability at 5 weeks ($r = .74$), and demonstrated convergent and discriminant validity (Buhr & Dugas, 2002).

Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988). The BAI is a 21-item measure of state anxiety. Participants rate to what degree they were affected by each anxiety symptom over the past week (see Appendix D). The measure has excellent internal consistency ($\alpha = .92$), high test-retest reliability at 1 week ($r = .75$), and demonstrated convergent and discriminate validity (Beck et al., 1988).

Center for Epidemiological Studies - Depression Scale (CES-D; Rudolf, 1977). The CES-D is a 20-item questionnaire designed to measure depressive symptomatology in the general population (see Appendix D). Participants rate items according to how often they experienced each symptom during the past week. The CES-D has high internal consistency ($\alpha = .85$ to .90), acceptable test-retest reliability ($r = .67$ at 4 weeks), and demonstrated concurrent and construct validity (Rudolf, 1977).

Social Problem-Solving Inventory-Revised (SPSI-R; D'Zurilla, Nezu, & Maydeu-Olivares, 1998). The SPSI-R is comprised of 52 items designed to measure self-report of social problem-solving ability (see Appendix D). The items are divided into 5 subscales, 3 of which were used in the present study: Rational Problem Solving (RPS), Impulsivity/ Carelessness Style (ICS), and Avoidance Style (AS). The questionnaire has adequate internal consistency, $\alpha = .79$ to .83, and test-retest reliability at 3 weeks, $r = .74$ (D'Zurilla et al., 1998).

Negative Problem Orientation Questionnaire (NPOQ; NPOQ; French version: Gosselin, Pelletier, & Ladouceur, 2001; English translation: Robichaud & Dugas, 2005). The NPOQ is a 12-item measure that assesses the tendency to doubt one's problem-solving ability, to view problems as threatening, and to be pessimistic about the outcome of problem solving (see Appendix C). Participants rate items according to how they react

or think when confronted with a problem. The measure is unifactorial, displays excellent internal consistency ($\alpha = .92$), high test-retest reliability ($r = .80$) and good convergent and discriminant validity (Robichaud & Dugas, 2005).

Results

Reliability of the Interview

In order to determine whether scoring for the problem-solving interview displayed adequate reliability, intraclass correlations between scores obtained from both independent coders were computed. Specifically, a two-way mixed model with measure of absolute agreement was calculated for all six problem-solving steps for both the other-relevant and self-relevant problem. For the other-relevant problem steps, intraclass correlations between coders ranged from $ICC = .79$ to .94, and for the self-relevant steps, the correlations ranged from $ICC = .76$ to .87. Scores obtained from the first coder were used for all subsequent analyses.

Descriptive Statistics for Problem-Solving Steps

The mean scores and standard deviations for each of the problem-solving steps according to problem relevance are presented in Table 4.1. Overall, regardless of personal relevance of the problem, participants performed at a moderate level, with means ranging from 2.56 ($SD = 1.36$) to 4.20 ($SD = 1.28$) on an 8-point scale.

Problem-Solving Ability and Emotional State

In order to look at the relationship between problem-solving ability and emotional state, correlations were initially computed between the problem-solving scores and the BAI and the CES-D irrespective of scores on the IUS. The CES-D was found to have a significant negative correlation with the generation of alternatives step ($r = -.30, p < .05$)

Table 4.1

Mean Scores for Problem-Solving Steps According to Problem Type (n = 62)

	Problem-solving steps						
Problem Type	PD	GF	GAS	DM	SI	SV	TOTAL
Other-relevant							
M	3.29	3.65	3.66	2.56	3.71	3.66	3.42
SD	2.15	1.74	1.68	1.36	1.36	1.24	.87
Self-relevant							
M	3.46	4.20	3.25	2.98	3.70	3.75	3.50
SD	1.34	1.28	1.22	1.40	1.23	1.31	.91

Note. PD = problem definition; GF = goal formulation; GAS = generation of alternative solutions; DM = decision-making; SI = solution implementation; SV = solution verification.

and the solution implementation step (r = -.30, p < .05), however only for the personally relevant problem. No other significant relationships between the measures were found[1].

A median split on the IUS was conducted in order to separate participants into high and low intolerance of uncertainty groups. Separate correlation matrices were subsequently computed between the emotion measures (BAI, CES-D) and the problem-solving scores for both the low and the high IUS groups. No significant correlations between the measures emerged among the low intolerance of uncertainty group for either the other-relevant or self-relevant problems. In the high intolerance of uncertainty group, several significant relationships were found, however only for the self-relevant problem (see Table 4.2). Significant negative correlations emerged for the BAI with respect to the problem definition and goal formulation steps, whereas the CES-D was significantly negatively correlated with the generation of alternatives and solution implementation steps. Moreover, these relationships were maintained when controlling for the other emotional state measure separately. That is, the correlation between the BAI and the problem definition step remains significant after controlling for scores on the CES-D (r = -.38, p < .05), although the relationship between the BAI and the goal formulation step becomes a non-significant trend (r = -.32, p < .10) after controlling for CES-D scores. In addition, after controlling for scores on the BAI, the CES-D retains a significant relationship with the generation of alternatives step (r = -.46, p < .01) and the solution implementation step (r = -.41, p < .05).

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[1]Given the small size of the sample where effects were anticipated (high intolerance of uncertainty group; n = 33) and the novel interview procedure devised for the study, alpha level corrections were expected to render significance testing overly stringent (i.e., increase in Type II error). Therefore, Bonferroni corrections were not applied to the study's correlational analyses.

Table 4.2

Intercorrelations Between Measures of Emotional State and Scores on the Problem-Solving Steps in the High Intolerance of Uncertainty Group (n = 33).

	Problem-solving steps						
SPSI-R scales	PD	GF	GAS	DM	SI	SV	TOTAL
				Other-relevant problem			
BAI	-.09	-.03	.16	-.23	-.12	.09	-.06
CES-D	-.08	-.04	-.26	-.34	-.34	-.01	-.27
				Self-relevant problem			
BAI	-.47**	-.40*	-.08	-.02	-.32	-.22	-.38*
CES-D	-.32	-.25	-.44*	-.21	-.50**	-.33	-.51**

Note. PD = problem definition; GF = goal formulation; GAS = generation of alternative solutions; DM = decision-making; SI = solution implementation; SV = solution verification; BAI Beck Anxiety Inventory; CES-D = Center for Epidemiological Studies – Depression Scale.

* $p < .05$; ** $p < .01$

Problem-Solving Ability, the SPSI-R, and the NPOQ

A series of correlations were computed to test the relationship between the subscales of the SPSI-R, the NPOQ, and scores on the problem-solving interview. No significant correlations emerged between any of the steps for the other-relevant problem and the subscales of the SPSI-R (ICS, AS, and RPS), although the NPOQ was significantly correlated with the decision-making step ($r = -.25$, $p < .05$). For the self-relevant problem, the generation of alternatives step was significantly correlated with the ICS ($r = -.29$, $p < .05$), the AS ($r = -.29$, $p < .05$), and the NPOQ ($r = -.28$, $p < .05$), the solution implementation step also shared a similar relationship with the ICS ($r = -.31$, $p < .05$), the AS ($r = -.30$, $p < .05$), and the NPOQ ($r = -.36$, $p < .01$), and the solution verification step was correlated with the NPOQ as well ($r = -.31$, $p < .05$). No other significant correlations emerged.

To test whether the relationship between the problem-solving scores and the measures of problem-solving styles and orientation primarily emerged among participants high in intolerance of uncertainty, separate correlation matrices were again devised for the low and high IUS groups. In the low intolerance of uncertainty group, the only correlation that emerged significant was a positive relationship between the decision-making step for the other-relevant problem and the AS subscale ($r = .39$, $p < .05$). For the high intolerance of uncertainty group, several significant relationships between the subscales and the self-relevant problem-solving scores emerged (see Table 4.3). Specifically, the NPOQ, AS, and ICS all shared at least one significant negative relationship with scores from the problem definition, generation of alternatives, decision-making, solution implementation, and solution verification steps.

Table 4.3

Intercorrelations Between Subscales of the SPSI-R and Scores on the Problem-Solving Steps in the High Intolerance of Uncertainty Group (n = 33).

	Problem-solving steps						
SPSI-R scales	PD	GF	GAS	DM	SI	SV	TOTAL
				Other-relevant problem			
ICS	-.04	.01	-.29	-.37*	-.09	.18	-.17
AS	-.05	.10	-.08	-.30	-.09	.08	-.09
RPS	-.12	.04	.10	.12	.11	-.23	.01
NPOQ	-.04	.06	-.29	.57**	-.31	-.06	-.30
				Self-relevant problem			
ICS	-.14	-.21	-.49**	-.33	-.34	-.03	-.38*
AS	-.36*	-.21	-.42*	-.33	-.53**	-.33	-.54**
RPS	.05	.13	.34	.18	.28	.04	.24
NPOQ	-.37*	-.25	-.37*	-.40*	-.55**	-.37*	-.57**

Note. PD = problem definition; GF = goal formulation; GAS = generation of alternative solutions; DM = decision-making; SI = solution implementation; SV = solution verification; ICS = impulsivity/carelessness style subscale of the SPSI-R; AS = avoidance style subscale of the SPSI-R; RPS = rational problem-solving subscale of the SPSI-R; NPOQ = Negative Problem Orientation Questionnaire

* $p < .05$; ** $p < .01$

Discussion

Overall, the hypotheses for the present study were confirmed. Impairments in performance on the problem-solving steps emerged among individuals high in intolerance of uncertainty, however only in conjunction with negative emotional states, and only for self-relevant problems. Moreover, problem-solving deficits were not uniform, but rather constrained to particular steps according to the reported emotional state. Specifically, the pairing of high intolerance of uncertainty and anxiety was related to poor performance on the initial problem-solving steps (i.e., problem definition and goal formulation), whereas depression was associated with poor performance on later problem-solving stages (i.e., generation of alternatives and solution implementation). Finally, scores on the problem-solving interview were unrelated to self-report of skills as assessed by the RPS subscale of the SPSI-R, although, as expected they were negatively related to the report of problem-solving styles and negative orientation. This finding subsequently became more pronounced at a high level of intolerance of uncertainty and virtually disappeared at low intolerance of uncertainty levels.

The Role of Intolerance of Uncertainty in Problem Solving

The finding of selective impairments in problem-solving ability according to level of intolerance of uncertainty provides some evidence for the notion that intolerance of uncertainty may in fact activate a threat appraisal in uncertain situations. Furthermore, it corroborates the cognitive theory of information processing that once threat appraisals are activated, individuals tend to selectively attend to threatening information and overestimate the magnitude of threat, resulting in less constructive coping actions (Beck & Clark, 1997). In terms of problem solving, this appears to manifest itself in poor

problem-solving performance at particular stages according to the reported mood state. In addition, given that research findings have identified intolerance of uncertainty as a higher-order construct central to GAD (see Dugas, Buhr, & Ladouceur, 2004), the present results suggest that problem-solving impairments may in fact be related to GAD, despite the prior null findings that emerged when worry was used as the variable of interest (e.g., Davey, 1994b; Dugas et al., 1995). Since intolerance of uncertainty has a strong conceptual link to problem solving owing to the inherent uncertainty present in problematic situations, intolerance of uncertainty may be a more sensitive and appropriate measure for understanding the relationship between problem-solving impairments and GAD.

As expected, deficits in problem-solving ability only emerged for self-relevant problems. That is, irrespective of both mood state and level of intolerance of uncertainty, participants did not display impaired performance on the problem-solving steps when attempting to solve a hypothetical problem. Rather, difficulties were only found when participants were asked to solve their own problems, suggesting that individuals high in intolerance of uncertainty are not generally impaired in their problem-solving skills, as they appear to be able to effectively use these skills when solving the problems of others. This finding is in line with prior research that failed to find a relationship between worry, and both self-report measures of problem-solving skills (e.g., Dugas et al., 1995) and interview measures such as the MEPS (e.g., Davey, 1994b). The selective deficits according to the relevance of the problem also further substantiate the theory that intolerance of uncertainty operates as a dispositional characteristic that activates a threat appraisal, as Beck and Clark (1997) note that threat appraisals initially orient individuals

to scan situations for personal relevance. Given that the problems of others are unlikely to have direct negative repercussions on the individual attempting to solve the problem, they are unlikely to activate this initial threat appraisal, and consequently problem-solving performance is unaffected.

The Role of Emotional State on Problem-Solving Ability

In addition to high intolerance of uncertainty and personal salience of the problematic situation, problem-solving impairments were also dependent on emotional state. In terms of anxiety, poor performance emerged for the initial stages of problem solving, specifically the problem definition and goal formulation steps, rather than the later stages as predicted by prior research (e.g., Marx et al., 1992). Similar results were found in a series of studies conducted by Stöber and colleagues (2000, 2002), where the elaboration of participants' problems showed a linear reduction in concreteness as worry about the particular problem situation increased. In the present study, high scores were given for the problem definition and goal formulation steps when participants were respectively able to concretely define the primary conflict and to generate concrete and specific goals. As such, concreteness is a necessary component to the successful resolution of these steps. As intolerance of uncertainty has a strong and consistent relationship with worry, the reduced concreteness evident as worry level increases may also be present among anxious individuals who are highly intolerant of uncertainty, thereby accounting for the poor performance on these initial problem-solving steps.

The finding of impairments with respect to anxiety may also be the result of a series of "what if" questions characteristic of GAD (Dugas et al., 1998). That is, anxious individuals who interpret the uncertainty within problems as threatening may be

ineffectively defining their problems by considering all possible elements of the problem (i.e., "what if X occurred?"), including irrelevant or assumptive information. As a consequence, the primary conflict of a given problem might be difficult for the individual to extract. Furthermore, owing to an unclear problem definition, the formulation of concise goals becomes similarly impaired. Interestingly, although it has been contended that anxious individuals would most likely be impaired at the solution implementation step (Marx et al., 1992), and that worriers should be particularly adept at defining their problems (Borkovec, 1985), these results suggest that the initial stages of problem solving are in fact the most problematic for anxious individuals. However, as the problem-solving interview in the present study did not assess the likelihood of actually implementing a chosen solution, it is plausible that anxiety also impairs the final stages of problem solving. In fact, given the uncertainty involved once a chosen solution is carried out, it seems likely that anxious individuals with high intolerance of uncertainty would avoid, or be impaired at, this final stage.

In contrast to the findings with respect to anxiety, depression scores were related to poor performance on the generation of alternatives and solution implementation stages, suggesting a deficit with the more elaborative and descriptive stages of the problem-solving process. This finding is consistent with the results of a qualitative analysis of problem-solving strategies among depressed patients. Marx and Schulze (1991) found that, compared to non-depressed controls, the solutions described by depressed participants were fewer in number and reflected a passive and resigned orientation to statically remain in a problematic situation without doing anything about it. In order to achieve high scores for the generation of alternatives and solution implementation stages

in the present study, participants had to generate a large number of potential solutions for the former step, and provide a detailed and concrete list of the steps required to complete a chosen solution for the latter. Given these requirements, the presence of static passivity and an unwillingness to change the situation would be expected to impede successful resolution of these steps. Of note, although Marx and colleagues (1991, 1992) found depression to be solely associated with deficits in generating alternative solutions, the measurement of problem solving used in both studies precluded any analysis of performance on the solution implementation step, rendering it plausible that the impairments noted in the present study might also have emerged.

Interestingly, unlike the results seen with anxiety, the relationship between depression and problem solving does not appear to be dependent upon level of intolerance of uncertainty, as poor performance on the generation of alternatives and solution implementation steps was also related to depression for the total sample. Depression may therefore have a more general relationship to problem-solving performance, wherein depressed individuals are either lacking the required skills to solve their problems or are unable or unwilling to apply their skills as a result of their depressogenic thinking. Several depression researchers have in fact given problem-solving deficits a primary role in their formulation of the disorder (e.g., McLean, 1976; Nezu, 1987; Nezu et al., 1989). However, the present results suggest that depressed mood may not necessarily be associated with overarching skills deficits, as depression scores were not related to poor performance on the other-relevant problem. If depression were associated with general skills impairment, these deficits would have emerged when solving any problem, irrespective of its personal relevance. Moreover, problem-solving

scores were unrelated to depression among the low intolerance of uncertainty group. It therefore seems that although depression may in fact have a more general relationship to problem-solving impairment than anxiety, information-processing and the activation of threat appraisals also appears to play a substantial role.

Problem Solving Scores and the Measurement of Problem Solving

Several interesting findings emerged with respect to the problem-solving interview and its relationship to the self-report of problem-solving ability. First, as predicted, the RPS subscale of the SPSI-R was unrelated to any of the problem-solving steps in the interview, irrespective of level of intolerance of uncertainty or relevance of the problem. Davey (1994b) found a similar result using the MEPS protocol. D'Zurilla and Maydeu-Olivares (1995) have contended that this discrepancy between self-report and interview format for the assessment of problem-solving ability is due to the fact that the SPSI-R is a process measure and problem-solving interviews are outcome measures. Process measures are viewed as the cognitive and behavioural activities that facilitate or inhibit problem-solving ability, with the RPS scale measuring "a constructive problem-solving dimension that may be defined as the rational, deliberate, and systematic application of effective problem-solving strategies and techniques" (p. 422). However, if individuals can in fact accurately report on their own effective use of the problem-solving steps, a positive relationship between the RPS and scores on the interview would be expected, since a facilitative process should enhance problem-solving performance. This should particularly be the case in the present study, as items on the RPS relate to each of the problem-solving steps that are described by D'Zurilla and Nezu (1999) and measured in the problem-solving interview. Moreover, as both the NPOQ and the ICS and AS

subscales had significant negative relationships with several of the steps in the problem-solving interview, it seems unlikely that the absence of an effect is due to the validity of the interview itself. It may therefore be the case that individuals cannot accurately self-report on their general use of problem-solving skills, particularly as both the relevance of a problem and dispositional characteristics like intolerance of uncertainty appear to differentially impact problem-solving performance.

In terms of the negative problem-solving styles measured by the ICS and AS subscales, a negative correlation emerged with several of the problem-solving steps, irrespective of level of intolerance of uncertainty. Given that both styles reflect the tendency to rush through or avoid the steps required for effective resolution of a problem, this relationship substantiates the assertion that these negative processes have a detrimental impact on problem-solving outcome (D'Zurilla & Maydeu-Olivares, 1995). It is nevertheless noteworthy that the negative problem-solving styles were solely related to scores for the self-relevant problem, suggesting that these negative tendencies are more likely to be used when the potential negative repercussions of a problem have personal salience and are therefore more threatening to the individual.

The strong relationship between negative problem orientation and poor performance on the problem-solving steps was an interesting result. In the GAD literature, it has typically been assumed that negative problem orientation does not impair problem-solving performance, but rather that it has an indirect deleterious effect through the avoidance of the problem-solving process altogether. Specifically, self-efficacy research suggests that individuals who perceive themselves as poor problem solvers would be less likely to attempt to cope with a problem situation, irrespective of their

actual abilities (Bandura, 1977). However, the results from the present study suggest that within the high intolerance of uncertainty group, negative problem orientation had a negative relationship to virtually all the problem-solving steps, albeit solely for the self-relevant problem. It can be hypothesized that either participants' self-report of negative problem orientation reflects an accurate appraisal of poor problem-solving ability, or that a negative orientation creates a self-fulfilling prophecy resulting in a low level of personal investment and effort into the problem-solving process. However, as negative problem orientation is unrelated both to scores on the other-relevant problem and on problem solving among low intolerance of uncertainty participants, it seems unlikely that a high negative problem orientation reflects an accurate self-report of problem-solving deficiencies. It may be that intolerance of uncertainty activates a threat appraisal that, with the addition of a high negative orientation, results in selective processing of threat and the expectation of poor performance and negative consequences, all of which might negatively impact upon problem-solving performance. It can therefore be suggested that negative problem orientation not only impedes action toward problem solving, but also impairs problem-solving activities once initiated.

Implications and Limitations of the Study

The findings of the present study present several implications and directions for future research. First, the paired roles of intolerance of uncertainty and anxiety substantiate the inclusion of problem-solving training as a component in the treatment of anxiety disorders, particularly GAD. Although problem-solving training is included in the Dugas (1998) cognitive-behavioral treatment for GAD, and research suggests that this component is highly beneficial in terms of treatment efficacy (Provencher et al., 2004), a

primary emphasis is nevertheless placed on targeting negative problem orientation in treatment. The present findings suggest, however, that training in the effective use of the problem-solving steps, with an emphasis on the application of these skills to personal problems, might be just as relevant. In terms of future research, it might be of interest to develop alternate other-relevant problems to assess whether performance on hypothetical problems remains unaffected by emotional state and level of intolerance of uncertainty. Specifically, the other-relevant problem involved an interpersonal conflict. Different findings might have emerged had the problem been work-oriented, a time management problem, or a situation requiring emotional coping. In addition, it might be of interest to investigate the relationship between personally-relevant problem-solving ability and other constructs linked to GAD. Several researchers have highlighted the roles of cognitive avoidance (i.e., Borkovec, Alcaine, & Behar, 2004), metacognitive beliefs (Wells & Carter, 2001), and emotion dysregulation (Mennin, Heimberg, Turk, & Fresco, 2002) in their models of the disorder, all of which may potentially impact upon problem-solving performance.

In terms of limitations, it is noteworthy that virtually no significant findings emerged for the decision-making or solution verification steps. Since Borkovec (1985) contended that worriers are excellent at identifying potential negative consequences to proposed solutions, it is surprising that decision-making was not related to anxiety. It may be that the interview questions for this step did not adequately tap this process, and future investigations on problem solving using an interview format should address this. Furthermore, given the small sample size that was further reduced when participants were split into high and low intolerance of uncertainty groups, several of the null findings

described in this study may not be a stable result. For example, the non-significant correlations among low intolerance of uncertainty participants might not remain if a larger sample size were tested. As such, the study findings need to be replicated with a large enough sample size to obtain acceptable power. Finally, it is important to note that the significant results in this study were entirely correlational in nature. As a consequence, the findings need to be viewed with caution, since no directional or causal statements can be made.

Notwithstanding the aforementioned limitations, this study was the first to investigate the combined roles of intolerance of uncertainty, problem relevance, and emotional state on the problem-solving process. Moreover, although some researchers have attempted to measure problem-solving ability according to personal relevance of the problem, the methodology of the present study was designed for the evaluation of current *unsolved* problems, thereby facilitating the activation of information processing biases. Our findings suggest that problem-solving skills may have a stronger relationship to anxiety in general, and GAD in particular, than expected. In addition, it appears that complex processes such as problem solving skills are best investigated as situation-specific processes that are dependent on several factors, including dispositional characteristics, emotional state, and salience of the problem to the individual.

CHAPTER 5

DISCUSSION

The overarching goals of the present research were two-fold: First, to develop novel assessment techniques for the measurement of social problem-solving constructs. Specifically, new instruments were developed for the assessment of both negative problem orientation and the various social problem-solving skills (e.g., problem definition and goal formulation). Second, to better understand the relationship between social problem solving and generalized anxiety disorder (GAD), as assessed through its cardinal feature of elevated levels of worry.

Summary of Findings

The first two studies dealt with the development and validation of a new measure of negative problem orientation. Given that the construct is considered a set of relatively stable schemas dealing with problems and problem solving, the NPOQ was designed to solely measure dysfunctional *cognitive* attitudes, with the exclusion of items reflecting behavioural and emotional consequences. In study 1, the 12-item measure was translated from its original French, and initial validation analyses revealed that the NPOQ has good internal consistency, high test-retest reliability at 5 weeks, and demonstrated convergent and discriminant validity.

The construct validity of the measure was further investigated in study 2, as well as the specificity of negative problem orientation to worry. The NPOQ was found to have good construct validity owing to its continued prediction of measures of psychological distress after the variance of conceptually similar personality measures was removed. That is, despite the overlap between negative problem orientation and the constructs of

pessimism, self-mastery, and neuroticism, the NPOQ significantly predicted scores on measures of both worry and depression after partialing out demographics and all three personality variables. Moreover, the NPOQ appears to be a better predictor of worry than depression, as it uniquely predicted 5.6% of the variance on the PSWQ compared to 1.6% on the CES-D. This latter finding suggests that the relationship between negative problem orientation and depression may be a by-product of the more generalized negative thinking that is both characteristic of depression and measured by global constructs such as pessimism, self-mastery, and neuroticism. With respect to worry, however, the relationship to negative problem orientation may be more specific. That is, although worriers may hold generalized negative thoughts, they also hold a set of independent thoughts that are particularly oriented toward the problem-solving process. Given that worry has been described as an attempt at mental problem solving (e.g., Borkovec, 1983), these findings were as expected.

In the third study, a novel problem-solving interview was developed in order to assess problem-solving ability according to each of the problem-solving steps elaborated upon by D'Zurilla and Nezu (1999). As prior research has failed to find a relationship between worry and problem-solving ability, intolerance of uncertainty, a dispositional characteristic (which results from a set of fundamental beliefs about uncertainty) that is highly and specifically associated with worry and GAD, was used as the variable of interest. Moreover, a distinction was made between problem-solving ability for hypothetical problems compared to one's own problems, as the personal salience of a problem, and the potentially negative consequences that a personal problem might engender, were expected to impact upon ability. Results showed that selective problem-

solving deficits emerged as a function of level of intolerance of uncertainty, personal relevance of the problem, and the particular emotional distress of the individual. Specifically, participants high on intolerance of uncertainty were found to display selective deficits in problem-solving ability for personal problems according to their mood state. Depression was correlated with difficulties on the generation of alternatives and solution implementation steps, and anxiety was associated with difficulties on the problem definition and goal formulation steps. No deficits in ability were found among individuals low on intolerance of uncertainty, irrespective of emotional state or problem relevance. Several conclusions were derived from these findings. First, the role of threat appraisals on information processing was substantiated, as problem-solving difficulties only emerged among individuals high in intolerance of uncertainty. Given that problems necessarily involve uncertain future events (potential outcomes), a threat or danger appraisal would be activated among individuals who are highly intolerant of uncertainty, and this threat activation appears to negatively impact upon problem-solving performance. Second, it appears that despite earlier contentions that anxious individuals do not experience problem-solving deficits other than an elevated negative orientation, this does not seem to be the case. Rather, the locus of impairments seems to differ according to the emotional state of the individual, with anxiety correlating with deficits on the initial stages of problem solving and depression correlation with deficits on more elaborative stages. Finally, the roles of intolerance of uncertainty and problem relevance within the present study highlight the context-dependent nature of social problem solving ability. In essence, the process of social problem solving, and by extension its

measurement, may be more complex than originally expected, placing certain null results from prior research in question.

Problem Solving and Worry

Although early theories on worry and GAD conceptualized a central relationship to social problem solving (see Borkovec, 1985; Davey, 1994a; Mathews, 1990), the importance of the construct in the understanding of worry was lessened over the years due to an absence of substantiating findings. Instead, emphasis has shifted to the impact of depression on social problem-solving ability, with the effective acquisition of problem-solving skills even becoming the primary goal in a treatment protocol (Nezu, Nezu, & Perri, 1989). However, the role of anxiety disorders in general, and GAD in particular, in the development and/or maintenance of problem-solving difficulties nevertheless remains conceptually convincing despite the heretofore absence of findings.

Social problems, by their very nature, are uncertain situations that can potentially engender future negative repercussions upon the individual faced with them. Moreover, because social problems involve a situation where there is no readily available solution, individuals must work to find the "best" solution to the problem as no perfect solution exists. Owing to this, there is always the potential for choosing the wrong solution, that is, one where the negative consequences outweigh the positive (D'Zurilla & Nezu, 1999), and even the best solution will likely involve some negative outcomes either to the individual or his or her social environment. It should therefore be expected that individuals sensitive to anxiety, as is necessarily the case for individuals with an anxiety disorder, would be apprehensive about dealing with social problems. In addition, the component processes involved in problem solving (e.g., problem definition, generation of

alternatives) can also be considered anxiety provoking. For example, in the decision-making stage, effective execution requires the individual to evaluate each potential solution to determine 1) whether it will properly address the problematic situation, 2) how much time and effort will be required, 3) the impact of the solution on the individual's emotional state, and 4) the short and long terms consequences of the solution from both a personal and interpersonal perspective. In addition to the stress of having to select an optimal solution based on these criteria, the knowledge that no matter which solution is chosen some negative consequences will likely occur can be expected to either lead to feelings of anxiety or exacerbate prior anxious feelings.

Although it may be postulated that all anxiety disorders share some relationship to problem-solving difficulties, for several reasons this is particularly the case with GAD. First, the primary feature of GAD is excessive and uncontrollable worry about a number of daily life events. That is, unlike other anxiety disorders that tend to involve a relatively circumscribed locus of anxiety, individuals with GAD will worry about several disparate events or situations, the focus of which can change from day to day. As a result, there is a wide and varied range of anxiety triggers for GAD, unlike other anxiety disorders which tend to be more focused on a specific class of triggers (e.g., social situations for social anxiety). It can therefore be expected that any daily life problem, irrespective of its nature, might lead to feelings of anxiety for an individual with GAD. Second, the manner in which worry is conceptualized tends to link it specifically to problem-solving difficulties. This is in evidence not only in some descriptions of worry as an attempt at mental problem solving that may create more problems than it solves (Borkovec, 1985; Mathews, 1990; Vasey & Borkovec, 1993), but also in theoretically-driven models of the

worry process within GAD. For example, Dugas and colleagues (1998) conceptualized worry as a series of "what if" questions about potential future negative events. The background of this GAD model is the construct of intolerance of uncertainty, where worry can be conceived of as an attempt to reduce or eliminate the uncertainties of life by trying to think about all possible future scenarios and contingencies (e.g., what if X happened? What if Y happened?). Such "scenario-building" thinking would be expected to negatively impact upon several of the problem solving steps. For example, successful resolution of the problem definition stage requires individuals to concisely and concretely describe the factual elements of the problematic situation without the inclusion of irrelevant or assumptive information. However, individuals with GAD might be prone to include all possible elements of the situation, rendering it difficult to not only identify what the core conflict is, but also to effectively address the problem solving steps that flow from problem definition.

Not only does GAD appear to have a notable relationship to problem-solving impairments, but the specificity of problem solving to depression can also be placed into question. Above and beyond the findings of study 2, wherein negative problem orientation shared a stronger unique relationship to worry scores than to depression, the negative thinking style and psychomotor retardation characteristic of the disorder may have a deleterious impact on all complex cognitive processes of which problem solving is only one. In fact, the "cognitive effort hypothesis" advanced that depressed individuals show cognitive impairments according to the complexity and effort involved in the task, such that automatic cognitive processes would not show deficits but demanding tasks, irrespective of the cognitive process, would be impaired (Hartlage et al., 1993). Unlike

experiential coping, which involves an automatic or preconscious response to daily hassles, social problem solving is considered a rational, deliberate, and effortful process (D'Zurilla & Maydeu-Olivares, 1995). As a result, problem solving may be impaired in depressed individuals not because of a particular deficit in problem-solving ability, but rather due to a general impairment in complex cognitive functioning. This does not appear to be the case with GAD, where the difficulties associated with problem solving appear to be specific to the problem-solving process. Although this does not imply that problem-solving training is not an important component in the treatment of depression, but rather that the role of problem solving ability might be given greater importance in future investigations and theoretical formulations of GAD.

The Future of Social Problem-Solving Assessment

One of the central themes within the current research has been a critique of the existing assessment techniques for the measurement of social problem solving and its component processes. Given the findings discovered herein, a discussion of the usefulness of contemporary measures of problem solving, the integration of the novel instruments developed in this research, and future directions for problem-solving research and psychopathology is warranted.

The strongest critiques in the above research have been launched against the SPSI-R, primarily due to the questionable validity of several of the measure's subscales. Notably, the negative problem orientation subscale appears to entangle process and outcome, and the RPS subscale may not in fact be measuring problem-solving ability but rather knowledge of effective problem-solving skills. However, the appeal of a self-report questionnaire to assess problem-solving ability is undeniable, particularly as

questionnaires are economical and easy to use. It may therefore be preferable to discriminate between those problem-solving processes that are amenable to self-report, and those that are better assessed either observationally or through interview. Given that problem orientation refers to an individual's perceptions regarding problems and problem-solving ability, a self-report questionnaire is ideal for the measurement of this process. The positive problem orientation subscale of the SPSI-R would therefore be an appropriate measurement tool as an indicator of constructive and potentially facilitative attitudes toward problem solving. In addition, given its focus on the dysfunctional cognitive attitudes of a negative problem orientation, the NPOQ can also be considered a good self-report tool, although further research into its validity with clinical populations is needed. However, because of both the context-dependent nature of problem-solving ability and the fact that individuals are not always reliable sources of information regarding their actual abilities (Bandura, 1997), self-report instruments such as the RPS subscale might not be appropriate for the measurement of problem-solving ability. Rather, interview procedures like the one devised in study 3 may be a more accurate assessment tool. Although more time-consuming and costly, an interview allows for the measurement of specific skills, and is divorced, albeit influenced by, individuals' perceptions of their ability. Observational methods might also be appropriate, although developing a realistic and personally relevant social problem in a research environment is often a challenge, and several critiques have been launched against the observational method with respect to the study of problem solving (see D'Zurilla & Nezu, 1999). It therefore appears that despite the efficiency and ease of use of questionnaires, they may

not be wholly feasible for certain aspects of the multi-dimensional construct of social problem solving.

To further complicate the picture of problem-solving assessment, a distinction must be made between process and outcome measures. As noted by D'Zurilla and Maydeu-Olivares (1995), process measures assess the factors that inhibit or facilitate problem solving such as specific strengths, weaknesses, and skills, whereas outcome measures assess the actual performance and effectiveness of problem solving. As the MEPS ultimately provides a quantitative score of effective problem-solving performance (i.e., achievement of a stated end for the hypothetical problems presented), it would be considered an outcome measure. However, the interview in the present study did not assess the quality of the chosen solution for the presented problems, but rather the effective execution of the various problem-solving steps, suggesting that it may in fact be considered a process measure. Although it is assumed that high scores on the problem-solving steps would indicate good problem-solving performance, this was not directly assessed in the present research. Future research might endeavour to measure both the process and the outcome of problem solving via interview, in order to determine whether the two are in fact related. Moreover, given that anxiety and depression scores in study 3 were associated with stage-specific deficits, the outcome of these impairments on problem-solving performance would be of interest.

In a related vein, future investigations might also develop a measure for the outcomes of a negative problem orientation. As it assesses dysfunctional cognitive attitudes about problems and problem solving, the NPOQ can be considered a process measure. However, it is unclear what the outcome of a negative orientation would be.

D'Zurilla and Nezu (1999) noted that it could be expected to lead to negative affective, cognitive, and behavioural consequences, such as frustration, worry, and procrastination or avoidance of the problem. Whether these outcomes would occur uniformly across different psychological disorders and whether different negative problem orientation outcomes would be associated with impairments on specific problem-solving steps are also potential sources for future investigation.

Problem Solving and the Anxiety Disorders

As noted previously, problem-solving impairments appear to have a conceptual link to the anxiety disorders. Although it is contended herein that GAD and excessive worry would be most highly linked to such deficits, this does not preclude the presence of specific deficits in ability across the other anxious disorders. In fact, given that individuals with anxiety conditions tend to fear future negative consequences, albeit generally relegated to the particular class of triggers specific to a disorder, problematic situations can be expected to be highly anxiety provoking given the nature of social problems. What may be a distinguishing factor for the presence of problem-solving impairments is the *type* of problem encountered by the individual.

Although the hallmark of GAD is excessive worry and anxiety over a number of daily life events, the focus of anxiety is more constrained for the other anxiety disorders. For example, an individual with panic disorder typically fears the experience of bodily sensations, social anxiety disorder is associated with anxiety in interpersonal situations, and an individual with contamination obsessions and cleaning compulsions might fear shaking hands with others or touching doorknobs. If an anxious individual were to experience a problematic situation that is either directly or peripherally related to the

locus of their fear, impairments in ability may be expected to occur. Information processing theory substantiates this hypothesis, as it is assumed that anxious individuals experience a narrowing of attention to threat cues and a resultant underestimation of coping resources when feeling threatened (Beck & Clark, 1997). However, precisely which problematic situations would trigger a threat appraisal might be dependent upon the particular disorder. For example, an interpersonal problem might be highly anxiety provoking and threatening to an individual with social anxiety disorder, however it may be similarly difficult for an individual with panic disorder with agoraphobia if the problem also involved confinement in a crowded space (e.g., party, restaurant).

In addition, research has begun to link certain subtypes of obsessive-compulsive disorder (OCD) to the cognitive predisposition of intolerance of uncertainty (Tolin et al., 2003). Given that problem-solving impairments emerged in study 3 among individuals high in intolerance of uncertainty, it is plausible that deficits in ability may also emerge for individuals with checking OCD for example. Alternatively, there may be other threat appraisals underlying specific anxiety disorders, other than intolerance of uncertainty, that might be activated by problematic situations. As very little research has been conducted on problem-solving ability and the anxiety disorders, particularly in terms of personal relevance and the activation of threat schemas, future research might investigate which, if any, types of problems (e.g., interpersonal, family, career/academic) would be negatively impacted by poor problem-solving performance, and whether alternate threat schemas are involved.

Conclusion

In sum, the present research dealt with the development and validation of two novel assessment techniques for the measurement of social problem-solving constructs. In studies 1 and 2, a new measure of negative problem orientation, the NPOQ, was translated and validated. In study 3, an interview procedure was devised to assess problem-solving ability, taking into consideration the twin roles of problem relevance and threat schemas. It was concluded that problem-solving impairments might be more highly related to GAD than originally assumed. Moreover, given the nature of both social problems and worry, the relationship between the constructs may be quite specific. Future research into social problem solving and psychological distress should consider the context-dependent nature of problem solving, as well as the assessment instruments used for the different components of the problem-solving process.

References

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review, 84,* 191-215.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Beck, A. T., & Clark, D. A. (1997). An information processing model of anxiety: Automatic and strategic processes. *Behaviour Research and Therapy, 35,* 49-58.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56,* 893-897.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory Manual* (2nd Ed.). San Antonio, TX: Psychological Corporation.

Belzer, K. D., D'Zurilla, T. J., & Maydeu-Olivares, A. (2002). Social problem solving and trait anxiety as predictors of worry in a college student population. *Personality and Individual Differences, 33,* 573-585.

Bloom, B. S., & Broder, L. J. (1950). *Problem-solving processes of college students.* Chicago: University of Chicago Press.

Borkovec, T. D. (1985). Worry: A potentially valuable concept. *Behaviour Research and Therapy, 23,* 481-482.

Borkovec, T. D., Alcaine, O., & Behar, E. (2004). Avoidance theory of worry and generalized anxiety disorder. In R. G. Heimberg, C. L. Turk, & D. S. Mennin

(Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 77-108). New York: Guilford Press.

Borkovec, T. D., & Hu, S. (1990). The effect of worry on cardiovascular response to phobic imagery. *Behaviour Research and Therapy, 28,* 69-73.

Borkovec, T. D., Robinson, E., Pruzinsky, T., & DePree, J. A. (1983). Preliminary exploration of worry: some characteristics and processes. *Behaviour Research and Therapy, 21,* 9-16.

Buhr, K., & Dugas, M. J. (2002). The Intolerance of Uncertainty Scale: Psychometric properties of the English version. *Behaviour Research and Therapy, 40,* 931-946.

Chang, E. C., & D'Zurilla, T. J. (1996). Relations between problem orientation and optimism, pessimism, and trait affectivity: A construct validation study. *Behaviour Research and Therapy, 34,* 185-195.

Chang, E. C., Maydeu-Olivares, A., & D'Zurilla, T. J. (1997). Optimism and pessimism as partially independent constructs: Relations to positive and negative affectivity and psychological well-being. *Personality and Individual Differences, 23,* 433-440.

Clark, L. A., Watson, D., & Mineka, S. (1994). Temperament, personality, and the mood and anxiety disorders. *Journal of Abnormal Psychology, 103,* 103-116.

Costa, P. T., Jr., & McCrae, R. R. (1989). *The NEO-PI / NEO-FFI manual supplement.* Odessa, FL: Psychological Assessment Resources.

Davey, G. C. L. (1993). A comparison of three worry questionnaires. *Behaviour Research and Therapy, 31,* 51-56.

Davey, G. C. L. (1994a). Pathological worrying as exacerbated problem-solving. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: Perspectives on theory, assessment and treatment* (pp. 35-59). New York: Wiley.

Davey, G. C. L. (1994b). Worrying, social problem-solving abilities, and social problem-solving confidence. *Behaviour Research and Therapy, 32,* 327-330.

Dember, W. N., Martin, S. H., Hummer, M. K., Howe, S. R., & Melton, R. (1989). The measurement of optimism and pessimism. *Current Psychology: Research and Reviews, 8,* 102-119.

Doerfler, L., Mullins, L., Griffin, N., Siegel, L., & Richards, C. (1984). Problem-solving deficits in depressed children, adolescents, and adults. *Cognitive Therapy and Research, 8,* 489-500.

Dugas, M. J. (2002). Generalized anxiety disorder. In M. Hersen (Ed.), *Clinical behavior therapy: Adults and children.* New York: Wiley.

Dugas, M.J., Buhr, K., & Ladouceur R. (2004). The role of intolerance of uncertainty in etiology and maintenance. In R.G. Heimberg, C.L. Turk, & D.S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 143-163). New York: Guilford Press.

Dugas, M. J., Freeston, M. H., & Ladouceur, R. (1997). Intolerance of uncertainty and problem orientation in worry. *Cognitive Therapy and Research, 21,* 593-606.

Dugas, M. J., Gagnon, F., Ladouceur, R., & Freeston, M. H. (1998). Generalized anxiety disorder: A preliminary test of a conceptual model. *Behaviour Research and Therapy, 36,* 215-226.

Dugas, M. J., Gosselin, P., & Ladouceur, R. (2001). Intolerance of uncertainty and worry: Investigating specificity in a nonclinical sample. *Cognitive Therapy and Research, 25,* 551-558.

Dugas, M. J., Hedayati, M., Karavidas, A., Buhr, K., Francis, K., & Phillips, N. A. (2005). Intolerance of uncertainty and information processing: Evidence of biased recall and interpretations. *Cognitive Therapy and Research, 29*, 57-70.

Dugas, M. J. & Ladouceur, R. (2000). Treatment of GAD: Targeting intolerance of uncertainty in two types of worry. *Behavior Modification, 24,* 635-657.

Dugas, M. J., Ladouceur, R., Léger, E., Freeston, M. H., Langlois, F., Provencher, M. D., & Boisvert, J. M. (2003). Group cognitive-behavioral therapy for generalized anxiety disorder: Treatment outcome and long-term follow-up. *Journal of Consulting and Clinical Psychology, 71,* 821-825.

Dugas, M. J., Letarte, H., Rhéaume, J., Freeston, M. H., & Ladouceur, R. (1995). Worry and problem solving: Evidence of a specific relationship. *Cognitive Therapy and Research, 19,* 109-120.

Dugas, M. J., Savard, P., Gaudet, A., Turcotte, J., Laugesen, N., Robichaud, M., Francis, K., & Koerner, N. (2005). Can the components of a cognitive model predict the severity of generalized anxiety disorder? Manuscript submitted for publication.

D'Zurilla, T. J., & Chang, E. C. (1995). The relations between social problem solving and coping. *Cognitive Therapy and Research, 19,* 547-562.

D'Zurilla, T. J., Chang, E. C., Nottingham IV, E. J., Faccini, L. (1998). Social problem-solving deficits and hopelessness, depression, and suicidal risk in college students and psychiatric inpatients. *Journal of Clinical Psychology, 54,* 1-17.

D'Zurilla, T. J., & Goldfried, M. R. (1971). Problem solving and behavior modification. *Journal of Abnormal Psychology, 78,* 107-126.

D'Zurilla, T. J., & Maydeu-Olivares, A. (1995). Conceptual and methodological issues in social problem-solving assessment. *Behavior Therapy, 26,* 409-432.

D'Zurilla, T. J., Maydeu-Olivares, A., & Kant, G. I. (1998). Age and gender differences in social problem-solving ability. *Personality and Individual Differences, 25,* 241-252.

D'Zurilla, T. J., & Nezu, A. M. (1990). Development and preliminary evaluation of the Social Problem-Solving Inventory. *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 2,* 156-163.

D'Zurilla, T. J., & Nezu, A. M. (1999). *Problem-solving therapy: A social competence approach to clinical intervention* (2nd ed.). New York: Springer.

D'Zurilla T. J., Nezu, A. M., & Maydeu-Olivares, A. (1998). *Manual for the Social Problem-Solving Inventory-Revised.* North Tonawanda, New York: Multi-Health Systems.

Enns, M. W., & Cox, B. J. (1997). Personality dimensions and depression: Review and commentary. *Canadian Journal of Psychiatry, 42,* 274-284.

Eysenck, H. J., & Eysenck, S. B. G. (1975). *Manual of the Eysenck Personality Questionnaire (junior and adult).* London: Hodder and Stoughton.

Freeston, M. H., Rhéaume, J., Letarte, H., Dugas, M. J., & Ladouceur, R. (1994). Why do people worry? *Personality and Individual Differences, 17,* 791-802.

Gosselin, P., Pelletier, O., & Ladouceur, R. (2000, October). *Le questionnaire d'attitude face au problème: Développement et analyses preliminaries [The Negative*

Problem Orientation Questionnaire: Development and preliminary analyses]. Poster session presented at the annual meeting of the Société Québécoise pour la Recherche en Psychologie, Hull, QC.

Gosselin, P., Pelletier, O., & Ladouceur, R. (2001, July). *The Negative Problem Orientation Questionnaire (NPOQ): Development and validation among a non-clinical sample.* Poster session presented at the annual meeting of the World Congress of Behavioral and Cognitive Therapies, Vancouver, BC.

Gotlib, I., & Asarnow, R. (1979). Interpersonal and impersonal problem-solving skills in mildly and clinically depressed university students. *Journal of Consulting and Clinical Psychology, 47,* 86-95.

Haaga, D. A. F., Fine, J. A., Terrill, D. R., Stewart, B. L., & Beck, A. T. (1995). Social problem-solving deficits, dependency, and depressive symptoms. *Cognitive Therapy and Research, 19,* 147-158.

Hartlage, S., Alloy, L. B., Vázquez, C., & Dykman, B. (1993). Automatic and effortful processing in depression. *Psychological Bulletin, 113,* 247-278.

Heppner, P. P. (1988). *The Problem-Solving Inventory.* Palo Alto, CA: Consulting Psychologist Press.

Heppner, P. P., & Petersen, C. H. (1982). The development and implications of a personal problem-solving inventory. *Journal of Counseling Psychology, 29,* 66-75.

House, R., & Scott, J. (1996). Problems in measuring problem-solving: The suitability of the Means-Ends Problem Solving (MEPS) procedure. *International Journal of Methods in Psychiatric Research, 6,* 243-251.

Kant, G. L., D'Zurilla, T. J., & Maydeu-Olivares, A. (1997). Social problem solving as a mediator of stress-related depression and anxiety in middle-aged and elderly community residents. *Cognitive Therapy and Research, 21,* 73-96.

Ladouceur, R., Blais, F., Freeston, M. H., & Dugas, M. J. (1998). Problem solving and problem orientation in generalized anxiety disorder. *Journal of Anxiety Disorders, 12,* 139-152.

Ladouceur, R., Dugas, M. J., Freeston, M. H., Léger, E., Gagnon, F., & Thibodeau, N. (2000). Efficacy of a cognitive-behavioral treatment for generalized anxiety disorder: Evaluation in a controlled clinical trial. *Journal of Consulting and Clinical Psychology, 68,* 957-964.

Ladouceur, R., Dugas, M. J., Freeston, M. H., Rhéaume, J., Blais, F., Gagnon, F., Thibodeau, N., & Boisvert, J.-M. (1999). Specificity of generalized anxiety disorder symptoms and processes. *Behavior Therapy, 30,* 191-207.

MacLeod, A. K. (1994). Worry and explanation-based pessimism. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: Perspectives on theory, assessment, and treatment.* New York: Wiley.

Marshall, G. N., & Lang, E. L. (1994). Optimism, self-mastery, and symptoms of depression in women professionals. *Journal of Personality and Social Psychology, 59,* 132-139.

Marx, E. M., & Schulze, C. C. (1991). Interpersonal problem-solving in depressed students. *Journal of Clinical Psychology, 47,* 361-367.

Marx, E. M., Williams, J. M. G., & Claridge, G. C. (1992). Depression and social problem solving. *Journal of Abnormal Psychology, 101,* 78-86.

Mathews, A. (1990). Why worry? The cognitive structure of anxiety. *Behaviour Research and Therapy, 28,* 455-468.

Maydeu-Olivares, A., & D'Zurilla, T. J. (1996). A factor-analytic study of the Social Problem-Solving Inventory: An integration of theory and data. *Cognitive Therapy and Research, 20,* 115-133.

McCabe, R. E., Blankstein, K. R., & Mills, J. S. (1999). Interpersonal sensitivity and social problem-solving: Relations with academic and social self-esteem, depressive symptoms, and academic performance. *Cognitive Therapy and Research, 23,* 587-604.

McLean, P. D. (1976). Depression as a specific response to stress. In J. G. Sarason & C. D. Spielberger (Eds.), *Stress and anxiety, Vol. 3* (pp. 297-323). Washington, DC: Hemisphere.

Mennin, D., Heimberg, R.G., Turk, C.L., & Fresco, D.M. (2002). Applying an emotion regulation framework to integrative approaches to generalized anxiety disorder. *Clinical Psychology: Science and Practice, 9,* 85-90.

Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy, 28,* 487-495.

Nezu, A. M. (1987). A problem-solving formulation of depression: A literature review and proposal of a pluralistic model. *Clinical Psychology Review, 7,* 121-144.

Nezu, A. M. (2004). Problem solving and behavior therapy revisited. *Behavior Therapy, 35,* 1-33.

Nezu, A. M., & Carnevale, G. J. (1987). Interpersonal problem solving and coping reactions of Vietnam veterans with posttraumatic stress disorder. *Journal of Abnormal Psychology, 96,* 155-157.

Nezu, A. M., Nezu, C. M., & Perri, M. G. (1989). *Problem-solving therapy for depression: Theory, research, and clinical guidelines.* New York: Wiley.

Nezu, A. M., & Perri, M. G. (1989). Social problem-solving therapy for unipolar depression: An initial dismantling investigation. *Journal of Consulting and Clinical Psychology, 57,* 408-413.

Nezu, A. M., & Ronan, G. F. (1987). Social problem solving and depression: Deficits in generating alternatives and decision making. *The Southern Psychologist, 3,* 29-34.

Nezu, C. M., Nezu, A. M., Friedman, S. H., Houts, P. S., DelliCarpini, L. A., Nemeth, C. B., & Faddis, S. (1999). Cancer and psychology distress: Two investigations regarding the role of problem solving. *Journal of Psychosocial Oncology, 16,* 27-40.

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100,* 569-582.

Osborn, A. (1963). *Applied Imagination: Principles and procedures of creative problem solving* (3rd ed.). New York: Charles Scribner's Sons.

Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19,* 2-21.

Platt, J. J., & Spivack, G. (1975). Unidimensionality of the Means-Ends Problem-Solving (MEPS) procedure. *Journal of Clinical Psychology, 31,* 15-16.

Provencher, M. D., Dugas, M. J., & Ladouceur, R. (2004). Efficacy of problem-solving training and cognitive exposure in the treatment of generalized anxiety disorder: A case replication series. *Cognitive and Behavioral Practice, 11,* 404-414.

Radloff, L. S. (1977). The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement, 1,* 385-401.

Reinecke, M. A., DuBois, D. L., & Schultz, T. M. (2001). Social problem solving, mood, and suicidality among inpatient adolescents. *Cognitive Therapy and Research, 25,* 743-756.

Robichaud, M., & Dugas, M. J., & Conway, M. (2003). Gender differences in worry and associated cognitive-behavioral variables. *Journal of Anxiety Disorders, 17,* 501-516.

Robichaud, M., & Dugas, M. J. (2005). Negative problem orientation (part I): Psychometric properties of a new measure. *Behaviour Research and Therapy, 43,* 391-401.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4,* 219-247.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67,* 1063-1078.

Skinner, B. F. (1953). *Science and human behavior.* New York: Macmillan.

Stöber, J., & Borkovec, T. D. (2002). Reduced concreteness of worry in generalized anxiety disorder: Findings from a therapy study. *Cognitive Therapy and Research, 26,* 89-96.

Stöber, J., Tepperwien, S., & Staak, M. (2000). Worrying leads to reduced concreteness of problem elaborations: Evidence for the avoidance theory of worry. *Anxiety, Stress, and Coping, 13,* 217-227.

Sylvain, C., Ladouceur, R., Boisvert, J.-M. (1997). Cognitive and behavioral treatment of pathological gambling: A controlled study. *Journal of Consulting and Clinical Psychology, 65,* 727-732.

Tisdelle, D. A., & St. Lawrence, J. S. (1986). Interpersonal problem-solving competency: Review and critique of the literature. *Clinical Psychology Review, 6,* 337-356.

Tolin, D. F., Abramowitz, J. S., Brigidi, B. D., & Foa, E. B. (2003). Intolerance of uncertainty in obsessive-compulsive disorder. *Journal of Anxiety Disorders, 17,* 233-242.

Vasey, M., & Borkovec, T. D. (1992). A catastrophizing assessment of worrisome thoughts. *Cognitive Therapy and Research, 16,* 505-520.

Vallerand, R. J. (1989). Vers une méthodologie de validation trans-culturelle de questionnaires psychologiques: implications pour la recherche en langue française. [Toward a trans-cultural validation methodology for psychological questionnaires: implications for French language research]. *Canadian Psychology, 30,* 662-680.

Wells, A., & Carter, K. (2001). Further tests of a cognitive model of generalized anxiety disorder: Metacognitions and worry in GAD, panic disorder, social phobia, depression, and nonpatients. *Behavior Therapy, 32,* 85-102.

Appendix A:

Consent Forms for all Studies

Consent Form to Participate in Research (Study 1)

This is to state that I, _____, agree to participate in a program of research conducted by Melisa Robichaud, under the supervision of Dr. Michel J. Dugas in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Psychology of Concordia University.

A. PURPOSE

I have been informed that the purpose of the research is to assess thoughts and feelings associated with solving problems.

B. PROCEDURE

I have been informed that the study involves the following procedures: I will be requested to fill out five (5) questionnaires dealing with general attitudes, worry, anxiety, and problem solving. I have been informed that testing will take approximately fifteen (15 minutes). I will also be requested to fill out one of the questionnaires again in five (5) weeks. There is no deception in the experiment and I will not be required to do any task other than that described above. Any general information I give will not be associated with my data in the experiment. The signed consent form will not be kept with the responses to the questionnaires; all these documents will be kept under lock and key. I understand that my participation in the experiment, and the information and data I provide, will be kept strictly confidential.

C. CONDITIONS OF PARTICIPATION

- I understand that I am free to decline to participate in the study without negative consequences.
- I understand that I am free to withdraw my consent and discontinue my participation at any time without negative consequences.
- I understand that my participation in this study is strictly confidential (i.e., the researcher will know, but will not disclose my identity).
- I understand that the data from this study may be published.
- I understand the purpose of the study and know that there is no hidden motive of which I have not been fully informed.

I HAVE CURRENTLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) _____

SIGNATURE _____

WITNESS SIGNATURE _____

DATE _____

Consent Form to Participate in Research (Study 1-NPOQ retest)

This is to state that I, _____, agree to participate in a program of research conducted by Melisa Robichaud, under the supervision of Dr. Michel J. Dugas in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Psychology of Concordia University.

A. PURPOSE

I have been informed that the purpose of the research is to assess thoughts and feelings associated with solving problems.

B. PROCEDURE

I have been informed that the study involves the following procedure: I will be requested to fill out one questionnaires that deals with thoughts about problem solving. I have been informed that testing will take approximately five (5 minutes). There is no deception in the experiment and I will not be required to do any task other than that described above. Any general information I give will not be associated with my data in the experiment. The signed consent form will not be kept with the responses to the questionnaires; all these documents will be kept under lock and key. I understand that my participation in the experiment, and the information and data I provide, will be kept strictly confidential.

C. CONDITIONS OF PARTICIPATION

- I understand that I am free to decline to participate in the study without negative consequences.
- I understand that I am free to withdraw my consent and discontinue my participation at any time without negative consequences.
- I understand that my participation in this study is strictly confidential (i.e., the researcher will know, but will not disclose my identity).
- I understand that the data from this study may be published.
- I understand the purpose of the study and know that there is no hidden motive of which I have not been fully informed.

I HAVE CURRENTLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) _____

SIGNATURE _____

WITNESS SIGNATURE _____

DATE _____

Consent Form to Participate in Research (Study 2)

This is to state that I, _____, agree to participate in a program of research conducted by Melisa Robichaud, under the supervision of Dr. Michel J. Dugas in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Psychology of Concordia University.

A. PURPOSE

I have been informed that the purpose of the research is to examine different aspects of worry, as well as my general thoughts and feelings.

B. PROCEDURE

I have been informed that the study involves the following procedures: I will be requested to fill out seven (7) questionnaires dealing with general attitudes, feelings and thoughts, worry, and anxiety. I have been informed that testing will take approximately fifteen (15) minutes. There is no deception in the experiment and I will not be required to do any task other than that described above. Any general information I give will not be associated with my data in the experiment. The signed consent form will not be kept with the responses to the questionnaires; all these documents will be kept under lock and key. I understand that my participation in the experiment, and the information and data I provide, will be kept strictly confidential.

C. CONDITIONS OF PARTICIPATION

- I understand that I am free to decline to participate in the study without negative consequences.
- I understand that I am free to withdraw my consent and discontinue my participation at any time without negative consequences.
- I understand that my participation in this study is strictly confidential (i.e., the researcher will know, but will not disclose my identity).
- I understand that the data from this study may be published.
- I understand the purpose of the study and know that there is no hidden motive of which I have not been fully informed.

I HAVE CURRENTLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) _____

SIGNATURE _____

WITNESS SIGNATURE _____

DATE _____

Consent Form to Participate in Research (Study 3)

This is to state that I, _____, agree to participate in a program of research conducted by Melisa Robichaud, under the supervision of Dr. Michel J. Dugas in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Psychology of Concordia University.

A. PURPOSE

I have been informed that the purpose of the research is to study problem-solving ability.

B. PROCEDURE

I have been informed that the study involves the following procedures: I will be requested to fill out eight (8) questionnaires dealing with worry and problem solving. I will then be requested to think about a personal problem happening to me, and answer questions about how I solve problems. Participation will take approximately one hour and a half.
There is no deception in the experiment and I will not be required to do any task other than that described above. Any general information I give will not be associated with my data in the experiment. The signed consent form will not be kept with the responses to the questionnaires; all these documents will be kept under lock and key.
I understand that my participation in the experiment, and the information and data I provide, will be kept strictly confidential.

C. CONDITIONS OF PARTICIPATION

- I understand that I am free to decline to participate in the study without negative consequences.
- I understand that I am free to withdraw my consent and discontinue my participation at any time without negative consequences.
- I understand that my participation in this study is strictly confidential (i.e., the researcher will know, but will not disclose my identity).
- I understand that the data from this study may be published.
- I understand the purpose of the study and know that there is no hidden motive of which I have not been fully informed.

I HAVE CURRENTLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) _____

SIGNATURE _____

WITNESS SIGNATURE _____

DATE _____

Appendix B:

General Information Sheet

General Information Sheet

Age: _____

Sex: Male _____ Female _____

Education:

University year: 1 ____ 2 ____ 3 ____ other ____

Field of study: Psychology _____

Other (Please specify) _____

Status: Full-time _____ Part-time _____

First Language: English _____

French _____

Other (please specify) _____

Race/ Ethnicity (check one)

African-American / Black / Caribbean Origin _____

Asian-American / Asian Origin / Pacific Islander _____

Latino-a / Hispanic _____

American Indian / Alaska Native / Aboriginal Canadian _____

European Origin (e.g., Italian, Russian, Portuguese, Greek) / White _____

Bi-racial / Multi-racial _____

Appendix C:

Negative Problem Orientation Questionnaire –

Original French Version and English Translation

Negative Problem Orientation Questionnaire (French Version)

Questionnaire d'Attitude face aux Problèmes

Les gens peuvent réagir de différentes façons lorsqu'ils font face à des problèmes de la vie quotidienne (ex: problèmes de santé, disputes, manques de temps, etc.). Veuillez utiliser l'échelle ci-dessous pour exprimer jusqu'à quel point chacun des énoncés suivants correspond à votre façon de réagir ou de penser lorsque vous êtes confronté(e) à un problème. Écrivez le chiffre vous représentant, à l'avant de chacun des énoncés.

1	2	3	4	5
Pas du tout correspondant	Un peu correspondant	Assez correspondant	Très correspondant	Extrêmement correspondant

_____ 1. Je perçois les problèmes comme étant menaçant pour mon bien-être.

_____ 2. Je doute souvent de mes capacités à résoudre les problèmes.

_____ 3. Souvent, avant même d'avoir essayé de trouver une solution, je me dis qu'il est difficile de résoudre un problème.

_____ 4. Les problèmes qui m'arrivent me semblent souvent insurmontables.

_____ 5. Lorsque je tente de résoudre un problème, je remets souvent en question mes habiletés.

_____ 6. Souvent, j'ai l'impression que les problèmes qui m'arrivent ne peuvent être résolus.

_____ 7. Même si j'arrive à voir certaines solutions à mes problèmes, je doute qu'ils pourront se régler facilement.

_____ 8. J'ai tendance à voir les problèmes comme un danger.

_____ 9. Ma première reaction devant un problème est de remettre en question mes habiletés.

_____ 10. Je perçois souvent mes problèmes comme étant plus gros qu'ils le sont en réalité.

_____ 11. Même si j'ai regardé un problème sous tous les angles possibles, je me demande encore si la solution que j'ai retenue va être efficace.

_____ 12. Je considère les problèmes comme des obstacles qui perturbent mon fonctionnement.

Negative Problem Orientation Questionnaire (English Version)

NPOQ

People react in different ways when faced with problems in their daily lives (e.g., health problems, arguments, lack of time, etc.). Please use the scale below to indicate to what extent each of the following items corresponds to the way you react or think when confronted with a problem. Please circle the number that best corresponds to you for each item.

1	2	3	4	5
Not at all true of me	Slightly true of me	Moderately true of me	Very true of me	Extremely true of me

1. I see problems as a threat to my well-being.

   1 2 3 4 5

2. I often doubt my capacity to solve problems.

   1 2 3 4 5

3. Often before even trying to find a solution, I tell myself that it is difficult to solve problems.

   1 2 3 4 5

4. My problems often seem insurmountable.

   1 2 3 4 5

5. When I attempt to solve a problem, I often question my abilities.

   1 2 3 4 5

6. I often have the impression that my problems cannot be solved.

   1 2 3 4 5

7. Even if I manage to find some solutions to my problems, I doubt that they will be easily resolved.

   1 2 3 4 5

8. I have a tendency to see problems as a danger.

   1 2 3 4 5

9. My first reaction when faced with a problem is to question my abilities.

   1 2 3 4 5

10. I often see my problems as bigger than they really are.

    1 2 3 4 5

11. Even if I have looked at a problem from all possible angles, I still wonder if the solution I decided on will be effective.

    1 2 3 4 5

12. I consider problems to be obstacles that interfere with my functioning.

    1 2 3 4 5

Appendix D:

Study Questionnaires

Social Problem-Solving Inventory-Revised-Short Form (SPSI-R-SF)

Below are some ways that you might think, feel, and act when faced with **problems** in everyday living. We are not talking about the common hassles and pressures that you handle successfully every day. In this questionnaire, a problem is something important in your life that bothers you a lot but you don't immediately know how to make it better or stop it from bothering you so much. The problem could be something about yourself (such as your thoughts, feelings, behaviour, appearance, or health), your relationships with other people (such as your family, friends, teachers, or boss), or your environment and the things that you own (such as your house, car, property, money). Please read each statement carefully and indicate which number below (0 to 4) best shows how much the statement is true of you. See yourself as you usually think, feel, and act when you are faced with important problems in your life these days.

0	1	2	3	4
Not at all true of me	Slightly true of me	Moderately true of me	Very true of me	Extremely true of me

____ 1. I feel threatened and afraid when I have an important problem to solve.

____ 2. When making decisions, I do not evaluate all my options carefully enough

____ 3. I feel nervous and unsure of myself when I have an important decision to make.

____ 4. When my first efforts to solve a problem fail, I know if I persist and do not give up too easily, I will be able to eventually find a good solution.

____ 5. When I have a problem, I try to see it as a challenge or opportunity to benefit in some positive way from having the problem.

____ 6. I wait to see if a problem will resolve itself first, before trying to solve it myself.

____ 7. When my first efforts to solve a problem fail, I get very frustrated.

____ 8. When I am faced with a difficult problem, I doubt that I will be able to solve it on my own no matter how hard I try.

____ 9. Whenever I have a problem, I believe that it can be solved.

____ 10. I go out of my way to avoid having to deal with problems in my life.

____ 11. Difficult problems make me very upset.

____ 12. When I have a decision to make, I try to predict the positive and negative consequences of each option.

____ 13. When problems occur in my life, I like to deal with them as soon as possible.

____ 14. When I am trying to solve a problem, I go with the first idea that comes to mind.

____ 15. When I am faced with a difficult problem, I believe I will be able to solve it on my own if I try hard enough.

____ 16. When I have a problem to solve, one of the first things I do is get as many facts about the problem as possible.

____ 17. When a problem occurs in my life, I put off trying to solve it for as long as possible.

____ 18. I spend more time avoiding my problems than solving them.

____ 19. Before I try to solve a problem, I set a specific goal so that I know exactly what I want to accomplish

____ 20. When I have a decision to make, I do not take the time to think of the pros and cons of each option.

____ 21. After carrying out a solution to a problem, I try to evaluate as carefully as possible how much the situation has changed for the better.

____ 22. I put off solving problems until it is too late to do anything about them.

____ 23. When I am trying to solve a problem, I think of as many options as possible until I cannot come up with any more ideas.

____ 24. When making decisions, I go with my "gut feeling" without thinking too much about the consequences of each option.

____ 25. I am too impulsive when it comes to making decisions.

Extended Life Orientation Test (ELOT)

Please answer the following questions about yourself by selecting one of the numbers below which indicates the extent of your agreement with each statement. Read each statement carefully and place the appropriate number next to the statement. Consider yourself as you typically think and feel **these days**, not the way you might have felt in the past. Please be as honest as you can throughout, and try not to let your responses to one question influence your response to other questions. There is no right or wrong answer.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

____ 1. It is always good to be frank.

____ 2. It is best not to set your hopes too high since you will probably be disappointed.

____ 3. In uncertain times, I usually expect the best.

____ 4. Rarely do I expect good things to happen.

____ 5. If something can go wrong for me, it will.

____ 6. I always look on the bright side of things.

____ 7. Honesty is always the best policy.

____ 8. I'm always optimistic about my future.

____ 9. It's important for me to keep busy.

____ 10. I hardly ever expect things to go my way.

____ 11. When I undertake something new, I expect to succeed.

____ 12. Things never work out the way I want them to.

____ 13. I don't get upset too easily.

____ 14. If I make a decision on my own, I can pretty much count on the fact that it will turn out to be a poor one.

____ 15. Where there's a will, there's a way.

____ 16. I rarely count on good things happening to me.

____ 17. It is wise to flatter important people.

____ 18. Better to expect defeat: then it doesn't hit so hard when it comes.

____ 19. In general, things turn out all right in the end.

____ 20. Give me 50/50 odds and I will choose the wrong answer every time.

Beck Anxiety Inventory (BAI)

This questionnaire consists of a list of 21 symptoms associated with anxiety. Please read each symptom carefully and indicate, by circling a number (0 to 3), to what degree you have been affected by each of these symptoms over the past week, including today.

	Not at all	A little	Somewhat	A lot
1. Numbness or tingling	0	1	2	3
2. Feeling hot	0	1	2	3
3. Wobbliness in legs	0	1	2	3
4. Unable to relax	0	1	2	3
5. Fear of the worst happening	0	1	2	3
6. Dizzy or lightheaded	0	1	2	3
7. Heart pounding or racing	0	1	2	3
8. Unsteady	0	1	2	3
9. Terrified	0	1	2	3
10. Nervous	0	1	2	3
11. Feelings of choking	0	1	2	3
12. Hands trembling	0	1	2	3
13. Shaky	0	1	2	3
14. Fear of losing control	0	1	2	3
15. Difficulty breathing	0	1	2	3
16. Fear of dying	0	1	2	3
17. Scared	0	1	2	3
18. Indigestion or discomfort in abdomen	0	1	2	3
19. Faint	0	1	2	3

20. Face flushed	0	1	2	3
21. Sweating (not due to heat)	0	1	2	3

Beck Depression Inventory –II (BDI-II)

This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for each group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
   - 0 I do not feel sad.
   - 1 I feel sad much of the time.
   - 2 I am sad all the time.
   - 3 I am so sad or unhappy that I can't stand it.

2. Pessimism
   - 0 I am not discouraged about my future.
   - 1 I feel more discouraged about my future than I used to be.
   - 2 I do not expect things to work out for me.
   - 3 I feel my future is hopeless and will only get worse.

3. Past Failure
   - 0 I do not feel like a failure.
   - 1 I have failed more than I should have.
   - 2 As I look back, I see a lot of failures.
   - 3 I feel I am a total failure as a person.

4. Loss of Pleasure
   - 0 I get as much pleasure as I ever did from the things I enjoy.
   - 1 I don't enjoy things as much as I used to.
   - 2 I get very little pleasure from the things I used to enjoy.
   - 3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings
   - 0 I don't feel particularly guilty.
   - 1 I feel guilty over many things I have done or should have done.
   - 2 I feel quite guilty most of the time.
   - 3 I feel guilty all of the time.

6. Punishment Feelings
   - 0 I don't feel I am being punished.
   - 1 I feel I may be punished.
   - 2 I expect to be punished.
   - 3 I feel I am being punished.

7. Self-Dislike
   0 I feel the same about myself as ever.
   1 I have lost confidence in myself.
   2 I am disappointed in myself.
   3 I dislike myself.

8. Self-Criticalness
   0 I don't criticize or blame myself more than usual.
   1 I am more critical of myself than I used to be.
   2 I criticize myself for all my faults.
   3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes
   0 I don't have any thoughts of killing myself.
   1 I have thoughts of killing myself, but I would not carry them out.
   2 I would like to kill myself.
   3 I would kill myself if I had the chance.

10. Crying
   0 I don't cry any more than I used to.
   1 I cry more now than I used to.
   2 I cry over every little thing.
   3 I feel like crying but I can't.

11. Agitation
   0 I am no more restless or wound up than usual.
   1 I feel more restless or wound up than usual.
   2 I am so restless or agitated that it's hard to stay still.
   3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest
   0 I have not lost interest in people or activities.
   1 I am less interested in other people or things than before.
   2 I have lost most of my interest in other people or things.
   3 It's hard to get interested in anything.

13. Indecisiveness
   0 I make decisions about as well as ever.
   1 I find it more difficult to make decisions than usual.
   2 I have much greater difficulty in making decisions than I used to.
   3 I have trouble making any decision.

14. Worthlessness
   0 I do not feel I am worthless.
   1 I don't consider myself as worthwhile and useful as I used to.
   2 I feel more worthless as compared to other people.

3 I feel utterly worthless.

15. Loss of Energy
0 I have as much energy as ever.
1 I have less energy than I used to have.
2 I don't have enough energy to do very much.
3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern
0 I have not experienced any changes in my sleeping pattern.
1a I sleep somewhat more than usual.
1b I sleep somewhat less than usual.
2a I sleep a lot more than usual.
2b I sleep a lot less than usual.
3a I sleep most of the day.
3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability
0 I am no more irritable than usual.
1 I am more irritable than usual.
2 I am much more irritable than usual.
3 I am irritable all the time.

18. Changes in Appetite
0 I have not experienced any changes in appetite.
1a My appetite is somewhat less than usual.
1b My appetite is somewhat greater than usual.
2a My appetite is much less than before.
2b My appetite is much greater than usual.
3a I have no appetite at all.
3b I crave food all the time.

19. Concentration Difficulty
0 I can concentrate as well as usual.
1 I can't concentrate as well as usual.
2 It's hard to keep my mind on anything for very long.
3 I find I can't concentrate on anything.

20. Tiredness or Fatigue
0 I am no more tired or fatigued than usual.
1 I get more tired or fatigued more easily than usual.
2 I am too tired or fatigued to do a lot of the things I used to do.
3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex
0 I have not noticed any recent change in my interest in sex.

1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.

Penn State Worry Questionnaire (PSWQ)

Please write the corresponding number (1 to 5) that best describes how typical or characteristic each item is of you.

1	2	3	4	5
Not at all typical		Somewhat typical		Very typical

____ 1. If I don't have enough time to do everything, I don't worry about it.

____ 2. My worries overwhelm me.

____ 3. I don't tend to worry about things.

____ 4. Many situations make me worry.

____ 5. I know I shouldn't worry about things, but I just can't help it.

____ 6. When I'm under pressure, I worry a lot.

____ 7. I am always worrying about something.

____ 8. I find it easy to dismiss worrisome thoughts.

____ 9. As soon as I finish one task, I start to worry about everything else I have to do.

____ 10. I never worry about anything.

____ 11. When there is nothing more that I can do about a concern, I don't worry about it anymore.

____ 12. I've been a worrier all my life.

____ 13. I notice that I have been worrying about things.

____ 14. Once I start worrying, I can't stop.

____ 15. I worry all the time.

____ 16. I worry about projects until they are done.

Centre for Epidemiological Studies – Depression Scale (CES-D)

Below is a list of ways that you might have felt or behaved. Please read each statement carefully and, using the scale below, write a number (0 to 3) beside each statement to indicate **how often** you have felt this way **during the past week**.

0	1	2	3
Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)

____ 1. I was bothered by things that usually don't bother me.

____ 2. I did not feel like eating; my appetite was poor.

____ 3. I felt that I could not shake off the blues even with help from my family or friends.

____ 4. I felt that I was just as good as other people.

____ 5. I had trouble keeping my mind on what I was doing.

____ 6. I felt depressed.

____ 7. I felt that everything I did was an effort.

____ 8. I felt hopeful about the future.

____ 9. I thought my life has been a failure.

____ 10. I felt fearful.

____ 11. My sleep was restless.

____ 12. I was happy.

____ 13. I talked less than usual.

____ 14. I felt lonely.

____ 15. People were unfriendly.

____ 16. I enjoyed life.

____ 17. I had crying spells.

____ 18. I felt sad.

____ 19. I felt that people dislike me.

____ 20. I could not get going.

Life Orientation Test – Revised (LOT-R)

Please answer the following questions about yourself by selecting a number which indicates the extent of your agreement with each statement. Read each statement carefully and write the appropriate number (0 to 4) next to the statement. Please be as honest and accurate as you can throughout, and try not to let your responses to one question influence your response to other questions. There is no right or wrong answer.

0	1	2	3	4
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

____ 1. In uncertain times, I usually expect the best.

____ 2. It's easy for me to relax.

____ 3. If something can go wrong for me, it will.

____ 4. I'm always optimistic about my future.

____ 5. I enjoy my friends a lot.

____ 6. It's important for me to keep busy.

____ 7. I hardly ever expect things to go my way.

____ 8. I don't get upset too easily.

____ 9. I rarely count on good things happening to me.

____ 10. Overall, I expect more good things to happen to me than bad.

Self-Mastery Scale (SMS)

Please answer the following questions about yourself. For each of the statements, indicate the extent of your agreement by writing the appropriate number (0 to 4) next to each statement. Try not to let your response to one question influence your response to other questions.

0	1	2	3	4
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

____ 1. What happens to me in the future mostly depends on me.

____ 2. I can do just about anything I really set my mind to do.

____ 3. Sometimes I feel that I am being pushed around in life.

____ 4. I have little control over the things that happen to me.

____ 5. There is really no way I can solve some of the problems I have.

____ 6. I often feel helpless in dealing with the problems of life.

____ 7. There is little I can do to change many of the important things in my life.

NEO Five Factor Inventory (NEO-FFI) – Neuroticism Subscale

Please answer the following questions about yourself. For each of the statements, indicate the extent of your agreement by writing the appropriate number (1 to 5) next to each statement. Try not to let your response to one question influence your response to other questions.

1	2	3	4	5
Not at all true of me		True of me to some extent		Very Much true of me

____ 1. I am not a worrier.

____ 2. I often feel inferior to others.

____ 3. When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.

____ 4. I rarely feel lonely or blue.

____ 5. I often feel tense and jittery.

____ 6. Sometimes I feel completely worthless.

____ 7. I rarely feel fearful or anxious.

____ 8. I often get angry at the way people treat me.

____ 9. Too often, when things go wrong, I get discouraged and feel like giving up.

____ 10. I am seldom sad or depressed.

____ 11. I often feel helpless and want someone else to solve my problems.

____ 12. At times I have been so ashamed I just wanted to hide.

Intolerance of Uncertainty Scale (IUS)

You will find below a series of statements which describe how people may react to the uncertainties of life. Please use the scale below to describe to what extent each item is characteristic of you. For each statement, please write a number (1 to 5) that describes you best.

1	2	3	4	5
Not at all characteristic of me		Somewhat characteristic of me		Entirely characteristic of me

____ 1. Uncertainty stops me from having a firm opinion.

____ 2. Being uncertain means that a person is disorganized.

____ 3. Uncertainty makes like intolerable.

____ 4. It's unfair not having any guarantees in life.

____ 5. My mind can't be relaxed if I don't know what will happen tomorrow.

____ 6. Uncertainty makes me uneasy, anxious, or stressed.

____ 7. Unforeseen events upset me greatly.

____ 8. It frustrates me not having all the information I need.

____ 9. Uncertainty keeps me from living a full life.

____ 10. One should always look ahead so as to avoid surprises.

____ 11. A small unforeseen event can spoil everything, even with the best of planning.

____ 12. When it's time to act, uncertainty paralyses me.

____ 13. Being uncertain means that I am not first rate.

____ 14. When I am uncertain, I can't go forward.

____ 15. When I am uncertain, I can't function very well.

____ 16. Unlike me, others always seem to know where they are going with their lives.

____ 17. Uncertainty makes me vulnerable, unhappy, or sad.

____ 18. I always want to know what the future has in store for me.

____ 19. I can't stand being taken by surprise.

____ 20. The smallest doubt can stop me from acting.

____ 21. I should be able to organize everything in advance.

____ 22. Being uncertain means that I lack confidence.

____ 23. I think it's unfair that other people seem sure about their future.

____ 24. Uncertainty keeps me from sleeping soundly.

____ 25. I must get away from all uncertain situations.

____ 26. The ambiguities in life stress me.

____ 27. I can't stand being undecided about my future.

Social Problem-Solving Inventory – Revised (SPSI-R)

Below are some ways that you might think, feel, and act when faced with **problems** in everyday living. We are not talking about the common hassles and pressures that you handle successfully every day. In this questionnaire, a problem is something important in your life that bothers you a lot but you don't immediately know how to make it better or stop it from bothering you so much. The problem could be something about yourself (such as your thoughts, feelings, behaviour, appearance, or health), your relationships with other people (such as your family, friends, teachers, or boss), or your environment and the things that you own (such as your house, car, property, money). Please read each statement carefully and indicate which number below (0 to 4) best shows how much the statement is true of you. See yourself as you usually think, feel, and act when you are faced with important problems in your life these days.

0	1	2	3	4
Not at all true of me	Slightly true of me	Moderately true of me	Very true of me	Extremely true of me

____ 1. I spend too much time worrying about my problems instead of trying to solve them.

____ 2. I feel threatened and afraid when I have an important problem to solve.

____ 3. When making decisions, I do **not** evaluate all my options carefully enough.

____ 4. When I have a decision to make, I fail to consider the effects that each option is likely to have on the well-being of other people.

____ 5. When I am trying to solve a problem, I often think of different solutions and then try to combine some of them to make a better solution.

____ 6. I feel nervous and unsure of myself when I have an important decision to make.

____ 7. When my first efforts to solve a problem fail, I know if I persist and do not give up too easily, I will be able to eventually find a good solution.

____ 8. When I am attempting to solve a problem, I act on the first idea that occurs to me.

____ 9. Whenever I have a problem, I believe that it can be solved.

____ 10. I wait to see if a problem will resolve itself first, before trying to solve it myself.

____ 11. When I have a problem to solve, one of the things I do is analyze the situation and try to identify what obstacles are keeping me from getting what I want.

____ 12. When my first efforts to solve a problem fail, I get very frustrated.

____ 13. When I am faced with a difficult problem, I doubt that I will be able to solve it on my own no matter how hard I try.

____ 14. When a problem occurs in my life, I put off trying to solve it for as long as possible.

____ 15. After carrying out a solution to a problem, I do **not** take the time to evaluate all of the results carefully.

____ 16. I go out of my way to avoid having to deal with problems in my life.

____ 17. Difficult problems make me very upset.

____ 18. When I have a decision to make, I try to predict the positive and negative consequences of each option.

____ 19. When problems occur in my life, I like to deal with them as soon as possible.

____ 20. When I am attempting to solve a problem, I try to be creative and think of new or original solutions.

____ 21. When I am trying to solve a problem, I go with the first good idea that comes to mind.

____ 22. When I try to think of different possible solutions to a problem, I **cannot** come up with many ideas.

____ 23. I prefer to avoid thinking about the problems in my life instead of trying to solve them.

____ 24. When making decisions, I consider both the immediate consequences and long-term consequences of each option.

____ 25. After carrying out my solution to a problem, I analyze what went right and what went wrong.

____ 26. After carrying out my solution to a problem, I examine my feelings and evaluate how much they have changed for the better.

____ 27. Before carrying out my solution to a problem, I practice the solution in order to increase my chances of success.

____ 28. When I am faced with a difficult problem, I believe I will be able to solve it on my own if I try hard enough.

____ 29. When I have a problem to solve, one of the first things I do is try to get as many facts about the problem as possible.

____ 30. I put off solving problems until it is too late to do anything about them.

____ 31. I spend more time avoiding my problems than solving them.

____ 32. When I am trying to solve a problem, I get so upset that I cannot think clearly.

____ 33. Before I try to solve a problem, I set a specific goal so that I know exactly what I want to accomplish.

____ 34. When I have a decision to make, I do **not** take the time to consider the pros and cons of each option.

____ 35. When the outcome of my solution to a problem is not satisfactory, I try to find out what went wrong and then I try again.

____ 36. I hate having to solve the problems that occur in my life.

____ 37. After carrying out a solution to a problem, I try to evaluate as carefully as possible how much the situation has changed for the better.

____ 38. When I have a problem, I try to see it as a challenge or opportunity to benefit in some positive way from having a problem.

____ 39. When I am trying to solve a problem, I think of as many options as possible until I cannot come up with any more ideas.

____ 40. When I have a decision to make, I weigh the consequences of each option and compare them to each other.

____ 41. I become depressed and immobilized when I have an important problem to solve.

____ 42. When I am faced with a difficult problem, I go to someone else for help in solving it.

____ 43. When I have a decision to make, I consider the effects that each option is likely to have on my personal feelings.

____ 44. When I have a problem to solve, I examine what factors or circumstances in my environment might be contributing to the problem.

____ 45. When making decisions, I go with my "gut feeling" without thinking too much about the consequences of each option.

____ 46. When making decisions, I use a systematic method for judging and comparing alternatives.

____ 47. When I am trying to solve a problem, I keep in mind what my goal is at all times.

____ 48. When I am attempting to solve a problem, I approach it from as many different angles as possible.

____ 49. When I am having trouble understanding a problem, I try to get more specific and concrete information about the problem to help clarify it.

____ 50. When my first efforts to solve a problem fail, I get discouraged and depressed.

____ 51. When a solution that I have carried out does not solve my problem satisfactorily, I do **not** take the time to examine carefully why it did not work.

____ 52. I am too impulsive when it comes to making decisions.

Appendix E:

Problem-Solving Interview Protocol

Today, I am going to be asking you to work through some problems. I'm going to give you a problem, and I'll be asking you to try to solve it as best as you can, by walking through the problem-solving process.

1. What is a problem?

A problem is a complication in everyday life. It's a situation for which the solution is not immediately apparent, and there is no obvious right answer. This is different from daily routines or familiar hassles in life. A problem situation can often feel confusing and puzzling. People with daily life problems are often uncertain about what to do, and experience the problem as stressful, since there is no obvious solution. At the same time, in order to continue to function well in daily life, the problem situation needs to be dealt with. A current problem can often be chronic and ongoing, in other words, it keeps happening again and again. I'll give you an example. Let's say this is my problem:

> I'm a baseball player, and I'm on a baseball team, but I'm not a very good player. I'm not very good at hitting when I'm at the plate. We are at mid-season right now, and my team is at risk for not making the playoffs. I really want my team to win the championship, because there is a pretty big cash prize (as well as all that "we are the champions" glory!). I'm worried that because of my inferior batting ability, I'm hurting the team's chances to make the playoffs, which makes me feel like a failure.

The solution to this problem is not obvious, and this problem situation would most likely keep happening every time my team had another baseball game, making it a chronic, ongoing problem.

2. *What is a solution?*

Solutions for these types of problems are usually not obvious, and there are often several ways that the problem can be solved. For my baseball playing problem, solutions might include practicing hitting, quitting the team to improve their chances of winning the championship, asking for tips from other players, or hiring a batting coach.

Which solution would be the best for my problem would most likely depend on many factors. Have I made it clear what I mean by problems and solutions?

3. Presentation of the hypothetical problem

I'm going to present to you a situation that is a problem. I'm going to read to you what this person has described is the situation that is causing a problem. **[Hypothetical problem is read]**. The problem that I just described would be rated a 3 out of 4 on this scale of problem severity. **[Problem severity scale is presented]**. In other words, this is an important problem, but not an extreme problem. Can you think of a problem happening to you right now, that is currently unsolved, that you would rate at the same severity level? I would like you to describe to me the general situation that is problematic for you right now.

4. Preliminary instructions prior to interview

I will be asking you questions about how to solve this problem. Problem-solving can sometimes be a complex process that needs to be well thought-out, so I'll ask you to think about each question after I've asked you, and take your time before you answer. Before we begin, I want to warn you that after you've given me an answer to a question, I will always ask you "can you think of any more, or is there anything else?", but it doesn't mean that you have to come up with any more, it just means that I want to give you a

chance to tell me everything that is in your head about the question. I really want to give you the opportunity to exhaust all the possibilities that you can think of. I don't want to cut you off in your train of thought. I don't want you to feel any pressure to give me anymore when I ask you if you can think of anything else. Like I said, this is just to give you the opportunity to think about whether there is anything else you want to say.

5A. Instructions if participants are asked to solve the hypothetical problem first

Now I'm going to read to you again the problem that I read earlier. [**Hypothetical problem is read again to participants**]. This is not your problem, but someone else's. I want you to imagine that you are being asked to solve this problem. You are not being asked to solve it for the person, that is, you are not going to make suggestions to this person directly or be involved in the solution at all. For example, you wouldn't say "I would talk to this person and tell them..." Instead, I'm going to ask you to solve it in such a way that if your suggestions were written down, this person could solve it on his (or her) own.

5B. Instructions if participants are asked to solve the personal problem first

Previously, you told me about a problem situation that you are currently experiencing. You rated that problem as a 3 out of 4 on the problem severity scale. I would like you to describe to me the general situation that is problematic for you right now. [**participants are asked to provide more description of the problematic situation**]

Problem-Solving Interview Questions

Problem Definition Stage

If asked about hypothetical problem: I've just described to you the problem situation as this person sees it. How would you define what exactly the problem is? If you had to give a clear definition of what the problem is, what would you say?

If asked about personal problem: You have now made me aware of what the situation is. How would you define what exactly the problem is? If you had to give a clear definition of what the problem is, what would you say?

Illustrative example: I'll explain to you what I mean by this question. Going back to the baseball playing problem, I described the situation to you before: I'm a baseball player, and I'm on a baseball team, but I'm not a very good player. I'm not very good at hitting when I'm at the plate. We are at mid-season right now, and my team is at risk for not making the playoffs. I really want my team to win the championship, because there is a pretty big cash prize (as well as all that "we are the champions" glory!). I'm worried that because of my inferior batting ability, I'm hurting the team's chances to make the playoffs, which makes me feel like a failure.

Now, that is a description of the problematic situation. If I had to define what exactly the problem is I might say: My problem is that my baseball team is unlikely to make the playoffs and win the championship and I would like to win the championship, but I have a low batting average, and that is hurting the chances of the team to win.

Goal Formulation Stage

Interview question: What are the goals that should be set regarding this problem? That is, what do you think should be the objective in solving this problem?

Illustrative example: In my baseball playing example, a goal or objective I might set in solving this problem might be: I would like to improve my batting average.

Generation of Alternative Solutions Stage

Interview question: I would like you to come up with as many possibilities for solutions as you can. You are not actually deciding which solution you will choose yet, but rather just trying to think of as many options as possible. So that means, not all your possibilities have to be "good" or even realistic ones, rather I would like you to give me all the possibilities that you can think of.

Illustrative example: So, taking the ball playing example, there are lots of possibilities for solutions: a) I could quit the team; b) I could fake sick and not show up at the game; c) practice hitting with friends; d) ask people on my team to help me practice my batting; e) ask people on my team for tips on how to be a better hitter; f) I could hire a batting coach; g) consult with the coach about how he thinks I could improve my hitting; h) I could start going to the gym to get in better overall shape; i) I could take steroids; j) I could ask the whole team to meet more often for practice; k) I could observe other players and try to figure out their hitting style; l) I could read books on how to become a better hitter.

Decision-Making Stage

Interview Question: You've come up with a list of potential solutions that this person might use to solve their problem. Now you are not going to pick all of them, rather, you are going to have to figure out which one or ones this person should choose. What would you need to consider, when looking at your list of possible solutions, before deciding on which solution or solutions to pick? In other words, tell me what you would

base your decision on, when narrowing down the list of possible solutions. That means, what would be the criteria you would use to pick a solution?

Illustrative example: So in keeping with my baseball playing example, when I look at my list of possible solutions, I have 12 possibilities that I can pick from. But I am not going to pick all of them, rather I am going to pick one. The question is, how will I make that decision? What are the criteria that I would use to decide to pick solution #5 (ask people on my team for tips on how to be a better hitter) for example, instead of solution #2 (I could fake sick and not show up at the game)?

Solution Implementation Stage

Interview question: How would the solution that you have chosen be carried out? In other words, I would like you to tell me exactly all the steps that would be involved in actually carrying out this solution.

Illustrative example: So, with my ball playing example, if my final choice was to hire a batting coach, the steps involved in that choice might include: a) looking in the yellow pages for a batting coach, or asking my coach if he knew of a batting coach that I could hire; b) figuring out how much money it would cost to see a batting coach; how many hours a week? How much per hour? Can I afford it?; c) Developing a budget in order to afford the batting coach; d) Need to figure out what time to set up appointment: Where? When?

Solution Verification Stage

Interview question: How would you know whether the solution was working or not? In other words, what would you need to check or keep tabs on in order to know that the problem was solved?

Illustrative example: I can keep track of my batting average before I started seeing the batting coach and after: has my batting average gone up? Or I can ask other people whether they think that I am a better hitter now. What do my other team members think? What does the coach think? What does my batting coach think?

Appendix F:

Vignettes for Hypothetical Problem

Vignette presented to male participants:

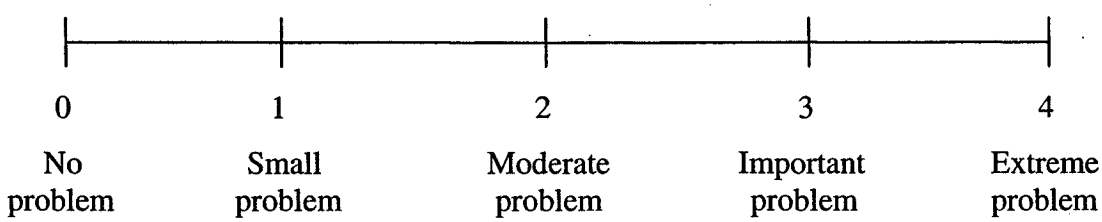
A 40 year old divorced woman has not been able to meet any stable, respectable single people who are interested in a serious, long-term relationship. She finds that most interesting people she meets are either already in a relationship or just interested in a "one night stand". She is beginning to believe that she will never have an intimate relationship with someone again, and that she will be alone for the rest of her life. She is feeling pretty lonely and depressed some of the time, and is losing her self-confidence.

Vignette presented to female participants:

A 40 year old divorced man has not been able to meet any stable, respectable single people who are interested in a serious, long-term relationship. He finds that most interesting people he meets are either already in a relationship or just interested in a "one night stand". He is beginning to believe that he will never have an intimate relationship with someone again, and that he will be alone for the rest of her life. He is feeling pretty lonely and depressed some of the time, and is losing his self-confidence.

Appendix G:

Severity Rating Scale for Social Problems


0
1
2
3
4
No problem
Small problem
Moderate problem
Important problem
Extreme problem

Appendix H:

Scoring Criteria for Problem-Solving Interview

Scoring Criteria

All steps of the interview protocols were scored on a scale from 0 to 8, higher scores reflecting greater competence for that particular step. Coders were provided with the following criteria for each step, with descriptions for the different scores occurring at each second point (i.e., descriptions were provided for scores of 0, 2, 4, 6, 8). The scoring points that were not described allowed coders some leeway to give a middle score if a participant answer did not quite correspond to the descriptions provided (e.g., an answer was better than a score of 2, but not quite as good for a score of 4, so given a final score of 3).

Scoring for Problem Definition Step

0 = primarily inferential (problem defined according to personality characteristics of self or others), internal attribution; no mention of obstacle or primary conflict;
if emotion is mentioned in definition, emotional consequence described as primary conflict

2 = some mention of conflict with added irrelevant elements and inferences drawn;
if emotion is mentioned, primary objective conflict described as secondary to emotional consequence

4 = mention of conflict + some mention of obstacle with inclusion of either irrelevant elements or inferences
if emotion is mentioned, inclusion of emotion is not listed as clearly secondary; seen as ad-hoc (additional) problem

6 = conflict and obstacle addressed; added elements (irrelevant), but no inferences drawn
if emotion is mentioned, it is clearly secondary, however not specifically stated in terms of its consequential relationship to primary conflict

8 = addressing primary conflict; obstacle included in definition; no inferences or assumptions incorporated in definition;
if emotion is mentioned, it is clearly secondary, and stated in terms of a potential exacerbating influence (e.g., sadness may be making this worse)

Troubleshooting for problem definition step

1. If the problem is emotion focused: primary conflict (what is & what should be) is defined in terms of emotion. That is, if emotion-focused problem is "How do I cope with my feelings of anxiety?" for example, then the conflict is presented thusly:

what is: feelings of anxiety

what should be: less or no anxiety

obstacle: whatever is causing the anxiety (this is usually uncontrollable; i.e.: loved one is sick, two people are fighting, etc.)

2. If, for an emotion focused problem, it is unclear whether emotion or the primary conflict takes precedence: although it is typically clear whether the defined problem is focusing on either the conflict or the emotion as the "main" problem, on occasion, the wording of the sentence makes it unclear.

Example 1: The problem is that he's lonely, which is due to his inability to find a relationship

Example 2: The problem is that he can't get a relationship, which is causing feelings of loneliness

In this case, whatever is *first* mentioned takes precedence when scoring. In example 1, when scoring this problem, the participant has made the emotion of loneliness the "main" problem; this individual would most likely get a low score on problem definition. In example 2, the participant has made the primary conflict the "main" problem, and would therefore get a higher score on problem definition

3. When faced with a complex problem: It is suggested that before even attempting to score problem definition at this stage, the "what is", "what should be", and the "obstacle" should be written out. From there, you can determine which of the problems is the focus.

4. The obstacle is unclear: You will often have a difficult time identifying what the obstacle is. Often, when it is a decision that is the problem, the obstacle is usually "uncertainty". Also, although you are given a problem identification sheet, there is at times no mention of the obstacle in the problem statement. You are permitted to listen to the participant's description of the problematic situation, which can often contain the obstacle.

Scoring for Goal Formulation Step

0 = none of the goals (if several) related to objective problem (primary conflict), not defined in realistic or attainable terms;
if multiple goals, not linked to each other in time (short-term vs. long-term) or target (problem-focused goals for changeable aspect of situation, emotion-focused goals for unchangeable aspect)

2 = goal or goals poorly related to objective problem (primary conflict); not very attainable or realistic; if multiple goals, mostly unlinked in time and target

4 = presence of goal or goals addressing the objective problem with addition of goals unrelated to primary problem; some are linked in time and target, some are not; presence of slightly unrealistic or unattainable aspects to goal(s).

6 = mostly addressing the objective problem (primary conflict), and no inclusion of unrelated goals (if several); if multiple goals, most are linked in time and target, realistic and attainable, one or two goals not linked in time or target

8 = all goals directly addressing the objective problem (primary conflict); defined in realistic / attainable terms; if multiple goals, related in time (short-term vs. long-term) and/or in terms of specific target (problem-focused goals for changeable aspect of situation, emotion-focused goals for unchangeable aspect)

Troubleshooting for goal formulation step

1. What if only one goal is listed? It is not necessary that participants list multiple goals, however when there is only one goal and it is perfectly on target to the problem, the participant would most likely get a score of 7. A score of 8 would only be given if the participant explicitly stated that the primary conflict was the major problem, and should therefore be the only goal (thereby implicitly providing a target) and mentioning that the goal is either long or short term (thereby providing a time).

Scoring for Generation of Alternative Solutions Step

0 = solutions are unrelated to the primary conflict, no novel / creative solutions, no deferment of judgment (silly possibilities); not clearly stated in terms of behaviours (use of broad, vague strategies); few solutions are generated, few different sets (0-4 solutions, 0-3 sets)

2 = adequate on quantity, poor on quality and variety : few solutions are related to the primary conflict; no novel/creative solutions, no deferment of judgment solutions; most solutions not clearly stated in terms of behaviours (use of broad, vague strategies); moderate number of solutions (5-9), integration of few different sets (0-3)

adequate on variety, poor on quality and quantity: few solutions are related to the primary conflict; no novel/creative solutions, no deferment of judgment solutions; most solutions not clearly stated in terms of behaviours (use of broad, vague strategies); few solutions generated (0-4), most solutions in different sets (e.g., if 4 solutions generated, 3 or 4 different sets)

adequate on quality, poor on quantity and variety: most solutions are related to primary conflict, some integration of novel /creative solutions or deferment of judgment (1-2); mostly stated in terms of specific behaviours; few solutions generated (0-4), integration of few different sets (0-3)

4 = adequate on quantity, quality, and variety: most solutions are related to primary conflict, some integration of novel /creative solutions or deferment of judgment (1-2); integration of several different solutions (5-9); integration of several different sets (4-7)

6 = good on quality and quantity, adequate on variety: all solutions are related to primary conflict, stated in terms of specific behaviours; integration of several novel / creative solutions + presence of deferment of judgment solutions; large number of solutions (10+), integration of several different sets (4-7)

good on quality and variety, adequate on quantity: all solutions related to primary conflict, stated in terms of specific behaviours; integration of several novel / creative solutions + presence of deferment of judgment solutions; integration of several different solutions (5-9), all expressed as different sets

good on quantity and variety, adequate on quality: most solutions are related to primary conflict, some integration of novel /creative solutions or deferment of judgment (1-2); mostly stated in terms of specific behaviours; large number of solutions (10+), large number of varied solutions (8+ sets)

8 = good on quantity, quality, and variety: all solutions related to primary conflict, stated in terms of specific behaviours; integration of several novel / creative solutions + presence of deferment of judgment solutions; large number of solutions (10+), large number of varied solutions (8+ sets)

Troubleshooting for generation of alternative solutions step

1. Criteria for quality: The solution must be related to the problem. Creative and silly solutions need to be included among the alternatives given. A good quality solution is stated specifically as a behaviour (e.g., go to counselling) rather than a strategy (e.g., improve self-esteem)

2. Criteria for quantity: Quantity relates to the number of solutions generated. A "poor" number of solutions have been generated if the participant provides between 0 and 4 solutions. An "adequate" amount is between 5 to 9 solutions. A "good" number of solutions is generated when the participant provides at least 10 solutions.

3. Criteria for variety: Variety refers to the number of sets of solutions provided by participants, that is, different types of solutions. For example, "take up bike riding", "start swimming", "go jogging in the morning" comprise one set of solutions as they all involve taking up a sport or physical activity. A "poor" number of sets is between 0 and 3, an "adequate" number is between 4 and 7, and a "good" number of sets is at least 8 different solution types.

Scoring for Decision-Making Step

0 = few, if any criteria mentioned; no elaboration of criteria (e.g., "consider pros & cons"); broad, vague statements; answers are primarily off-target regarding the question

2 = few criteria mentioned; little elaboration of criterion, no specific examples provided; most criteria described in broad, vague statements

4 = several criterion categories absent; some detail /elaboration provided, but inclusion of broad, vague statements

6 = most criterion categories mentioned, elaboration / detail provided, but "complete" answers missing (e.g., consideration of time, not effort; consideration of personal consequences in short-term, not in the long-term)

8 = all major criterion categories mentioned (i.e., time & effort, addressing the goals, consideration of personal and social consequences); specific mention of long-term consequences (either personal or social) in addition to short-term consequences; elaboration / detail provided for the criteria (i.e., specific examples from the generated solutions)

Troubleshooting for decision-making step

The four criteria upon which this step is scored are: 1) a consideration of the time and the effort required should a particular solution be chosen; 2) whether the solution addresses the goals the participant wishes to achieve for the problem; 3) a consideration of the consequences the solution will have on the individual, both in the short and the long-term; 4) a consideration of the consequences the solution will have on the individual's social environment (e.g., friends, family, work), both in the short and the long-term.

Scoring for Solution Implementation Step

0 = major steps involved in solution are not listed; no consideration of pitfalls / negative consequences; steps are listed in broad, vague terms

2 = few major steps involved in solution are listed; no consideration of pitfalls / negative consequences or alternate strategies; minor description in terms of specific actions

4 = several major steps involved in solution are listed, missing some primary steps; no consideration of pitfalls / negative consequences or alternate strategies; split between description in terms of specific actions and broad statements

6 = most major steps involved in solution are clearly listed; some consideration of pitfalls; mostly stated in terms of specific actions

8 = all major steps involved in solution are clearly listed; consideration of potential pitfalls or negative consequences, and description of alternate strategy; stated in terms of specific actions

Scoring for Solution Verification Step

0 = no checks are present

2 = presence of checks; not relevant to problem; not measurable activities, not according to response type list (see troubleshooting below); vague and unrealistic as checks

4 = presence of checks; most are realistic, precise, and relevant to problem; but checks are not expressed as a measurable activity, or according to response type list

6 = presence of checks; checks are realistic, precise, relevant to problem; most are measurable behaviours (indication of measurement), but lacking link to response type list

8 = presence of checks; relevant to problem; all checks are measurable activity; realistic and clear; according to response type list

Troubleshooting for solution verification step

A check constitutes some form of measurement that the individual can use to determine whether their chosen solution is in fact working as planned. A good check should involve some sort of written record and involve measurements that occur both before and after the solution is implemented in order to record progress. Optimal checks should be one of the following five types:

1. *Response frequency:* a simple count of the number of responses (ex: number of cups of coffee you drank)

2. *Response duration:* a record of the amount of time it takes to perform a response (ex: time spent studying)

3. *Response latency*: a record the time between the occurrence of a particular event or cue and the onset of a particular response (ex: # of minutes late to class)

4. *Response intensity:* a rating of the degree of intensity of something (ex: degree of anxiety, the degree of satisfaction associated with a particular event); often accomplished using a simple rating scale

5. *Response product:* this scoring is not a measure of the behaviour, but rather the product or effects of the behaviour (ex: number of dates accepted, number of boxes packed)

Appendix I:

Sample Coding Grid for Interview Integrity

Integrity Check Grid

Participant #:_____

	Present	Absent
Preliminary instructions		
Presentation of "what is a problem"		
Presentation of "what is a solution"		
• Deviation from script If present, what was said:		
• Additional comments by participant If present, what was said:		
BEGINNING WITH OBJECTIVE PROBLEM		
Reading of objective problem (gender appropriate)		
Description of severity scale		
Request for personal problem		
Reading of preliminary instructions		
Rereading of objective problem		
Framing objective problem		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Problem definition		
Statement of question		
Baseball example		
• Deviation from script?		

• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Goal formulation		
Statement of question		
Baseball example		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Generation of Alternatives		
Statement of question		
Baseball example		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		

• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Decision Making		
Statement of question		
Inclusion of example?		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Solution choice		
1. Statement of question		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		

• Additional comments by participant If present, what was said:		
Solution Implementation		
Statement of question		
Baseball example		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Solution Verification		
Statement of question		
Baseball example		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		

BEGINNING WITH PERSONAL PROBLEM QUESTIONS		
Prompt for additional presentation of problem		
Brief reminder of preliminary instructions		
Reminder of absence of baseball example		
• Deviation from script?		
Problem definition		
Statement of question		
Request for baseball example?		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Goal formulation		
Statement of question		
Request for baseball example?		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		

• Additional comments by participant If present, what was said:		
Generation of Alternatives		
Statement of question		
Request for baseball example?		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Decision Making		
Statement of question		
Request for example?		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Solution choice		

Statement of question		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Solution Implementation		
Statement of question		
Request for example?		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		
• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		
Solution Verification		
Statement of question		
Request for example?		
• Deviation from script?		
• Presence of leading or providing assistance If present, what was said:		

• Adding inferences or making assumptions If present, what was said:		
• Presence of judging responses If present, what was said:		
• Additional comments by participant If present, what was said:		