INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

Cognitive Correlates of Worry in Adolescents

Nina Laugesen

A Thesis

in

The Department

of

Psychology

Presented in Partial Fulfillment of the Requirements

For the Degree of Master of Arts at

Concordia University

Montreal, Quebec, Canada

August, 2000

National Library of Canada
Acquisitions and Bibliographic Services
395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale du Canada
Acquisitions et services bibliographiques
395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence

Our file Notre référence

0-612-54277-7

Canada

Abstract

Although research on worry has increased over the past 15 years, few studies have examined worry in adolescents (Vasey, 1993). Recently, Dugas and his colleagues (1998) have developed a model of excessive worry that has been highly effective for predicting the tendency to worry in adults. This model proposes that four process variables are associated with excessive worry: intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance. The goal of the present study is to explore the relationship between worry and these cognitive processes in an adolescent sample. Five hundred and twenty-eight participants aged 14 to 18 years completed questionnaires assessing worry, somatic anxiety symptoms, intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance. The first hypothesis, which predicted that each of the four process variables would make a unique contribution to the prediction of worry, was partially supported. Specifically, intolerance of uncertainty, positive beliefs about worry, and negative problem orientation made a unique contribution to the prediction of adolescent worry. The second hypothesis, which postulated that the four process variables would contribute to the discriminant function and that the discriminant function would be effective in classifying moderate and high worriers into their respective groups, was also partially supported. Results revealed that 72.8% of the original grouped cases were correctly classified. Finally, the third hypothesis, which proposed that intolerance of uncertainty would make the most important contribution to the prediction of worry and would be the most important variable in discriminating between moderate and high worry groups, was supported. Results suggest that intolerance of uncertainty may be a key construct implicated in the development and maintenance of worry in adolescence.

Acknowledgments

I would first like to thank my thesis supervisor, Dr. Michel J. Dugas, for his guidance, understanding and constant support; working with you has truly inspired me and led me to expect only the best from myself. I would also like to acknowledge the valuable contributions of my committee members, Dr. William Bukowski and Dr. Alex Schwartzman. Moreover, I would like to thank Kylie Francis for her help with editing my thesis, Kristen Buhr for answering all my questions on intolerance of uncertainty, Anusha Kassan for helping with data entry, and Melisa Robichaud for her help with data collection. Thanks are also due to l'école secondaire Cavelier de LaSalle and l'école secondaire Mont-Royal for letting me conduct this study with their students, as well as to the students for their interest and participation.

Finally, I would like to express my sincere gratitude to my parents, Nycole Laurin, Elo Laugesen, and Marilyn Laugesen, for their love, their faith in me, and their ongoing support – I couldn't have done it without you.

This study was funded by the Fonds pour la formation de chercheurs et l'aide à la recherche (Fonds FCAR).

Table of Contents

Introduction 1

The Definition of Worry 2
Adolescence: Storm and Stress 3
Worry and Cognitive Development in Adolescence 6
Models of Excessive Worry and GAD in Adults 9
The Present Study: The Laval Model of Excessive Worry 16
The Laval Model in Adolescence 22

Method 25

Participants 25
Measures 25
Procedure 27

Results 29

Data Screening 29
Analyses 29

Discussion 40

Prediction of Adolescent Worry 40
Discrimination Between Moderate and High Adolescent Worriers 42
The Role of Intolerance of Uncertainty in Adolescent Worry 46
The Development of Worry in Adolescence 50
Limitations 52
Future Directions 53
Concluding Remarks 54

References 56

Appendices 69

Cognitive Correlates of Worry in Adolescents

Although research on worry has increased over the past 15 years, it is only recently that researchers have begun to investigate worry in adolescence (Vasey, 1993). This is due, in part, to a shift in the conceptualization of generalized anxiety in children and adolescents (Eisen & Silverman, 1998). In the DSM-III-R (American Psychiatric Association, 1987), adult and child anxiety were seen as separate diagnostic categories. Specifically, Overanxious Disorder (OAD) was classified as an anxiety disorder of childhood and adolescence, whereas Generalized Anxiety Disorder (GAD) was limited to adults. However, there was considerable overlap between the two diagnostic categories. OAD was characterized by the presence of excessive worries about multiple future and past events, somatic complaints, and marked self-consciousness, while GAD was characterized by unrealistic or excessive worry about two or more life circumstances, as well as the presence of somatic anxiety symptoms. Unfortunately, the division of generalized anxiety into two categories in the DSM-III-R created a separation between the study of generalized anxiety in children and adolescents, and its study in adults, leaving a developmental gap in the literature (Berstein & Borchardt, 1990).

The advent of the DSM-IV (American Psychiatric Association, 1994) made substantial changes to the classification system of anxiety disorders. Specifically, OAD was subsumed under the category of GAD. Further, unrealistic worry was removed as a criterion, and excessive and uncontrollable worry became the main diagnostic feature of GAD. The consolidation of these two diagnostic categories and the inclusion of excessive and uncontrollable worry as the central feature of GAD has led to an increased focus on the study of worry across the lifespan (Kendall, Macdonald, & Treadwell, 1995). This type of research has demonstrated that there is a high incidence of worry in non-clinical

adult populations. Tallis, Davey, and Capuzzo (1994) found that 38% of their non-clinical sample reported worrying at least once a day. Given the prevalence of excessive worry in adults (Borkovec, Robinson, Pruzinsky, & DePree, 1983), it is not surprising that worry is also commonly observed in children and adolescents. For example, Brown, O'Keefe, Sanders, and Baker (1986) found that children and adolescents 8 to 18 years of age reported anxious anticipation and ruminative thoughts during periods of stress. Similarly, Bell-Dolan, Last, and Strauss (1990) assessed worry in a non-clinical sample of children and adolescents between the ages of 5 and 18 and found that 30% reported excessive worry. Finally, Fournier, Freeston, Ladouceur, Dugas, and Guévin (1996) found that 25% of adolescents endorsed questionnaire items concerning symptoms of excessive and uncontrollable worry.

The Definition of Worry

The absence of a clear definition of worry in previous research has prevented the formulation of specific testable predictions about the development of worry and its relationship to child and adolescent anxiety (Vasey & Daleiden, 1994). However, several research groups have suggested various definitions of adult worry. A preliminary definition of worry was proposed by Borkovec and his colleagues in 1983. They defined worry as repetitive, intrusive thoughts and images surrounding "an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes" (Borkovec et al., 1983). Similarly, Matthews (1990) has characterized worry as "awareness of possible future danger, which is repeatedly rehearsed without being resolved" (p.456). MacLeod, Williams, and Bekerian (1991) have suggested a definition of worry that encompasses the common features of the above definitions. They define worry as "a cognitive phenomenon that is concerned with future events where there is uncertainty about the

outcome and the future is seen as negative; all this is furthermore accompanied by feelings of anxiety"(p.478). Based on the assumption that the defining characteristics of worry in childhood and adolescence are largely consistent with current adult definitions, Vasey and Daleiden (1994) have suggested a tentative definition of worry in childhood and adolescence as "primarily an anticipatory cognitive process involving repetitive, primarily verbal thoughts related to possible threatening outcomes and their potential consequences. Furthermore, worry typically involves more than the anticipation of a single threatening event. Instead, the worrier also verbally elaborates an event's potential negative consequences" (Vasey & Daleiden, 1994, p.186). These definitions emphasize several key distinctions about worry, including the conceptualization of worry as a cognitive phenomenon, the focus on negative outcomes, and the pivotal role of uncertainty about future events.

Adolescence: Storm and Stress

Research suggests that worries are closely tied to life circumstances (Campbell, 1986; Gosselin et al., 1998; Vasey, 1993). One study conducted by Gosselin et al. (1998) examined the content of worry in a sample of adolescents. Results indicated that adolescents report worries that fall into five major categories: school/studies (66.2%), family/friends relationships (54.2%), love relationships (38.2%), own future (23.3%), and finances (19.8%). Results also revealed that worry content varied according to age; specifically, senior students reported worrying more about family, friends and love relationships, and their own future and finances, than did junior students. In addition, research suggests that there are gender differences in both the frequency and content of worry. Empirical evidence has demonstrated that girls report significantly more worries

when compared to boys (Kauffman, Brown, Graves, Henderson, & Revolinski, 1993; McGuire, Mitic, & Neumann, 1987; Spruijt-Metz & Spruijt-Metz, 1997). Moreover, comparisons of adolescent worry show that girls worry significantly more than boys about social concerns, such as family and social relationships (Gosselin et al., 1998; Kauffman, et al., 1993). The fact that adolescents' worries vary depending on factors such as age and gender supports previous research which suggests that adolescent worrying is affected by cognitive-developmental level, the environment, and life circumstances in general (Campbell, 1986; Vasey, 1993).

Adolescence has long been described as a period of storm and stress. Although not all adolescents encounter storm and stress, it is more likely to be experienced during adolescence than at any other age. In essence, the storm and stress theory refers to the idea that adolescence is a period of life that is more difficult in some ways than other periods (Buchanan et al., 1990). These difficulties appear to revolve around three key issues: (1) conflict with parents, (2) mood disruptions, and (3) risk behavior.

Research has shown that conflict with parents increases in early adolescence, and remains high until late adolescence. In fact, adolescents are likely to be rebellious and to resist adult authority. One study of early adolescence reported a rate of 2 conflicts every three days, or 20 per month, with parents and siblings (Montemayor & Hanson, 1985). Research also shows that these conflicts tend to be about day-to-day issues, and that adolescents are more likely to share more fundamental values with their parents, such as honesty or education (Arnett, 1999). Research suggests that an accumulation of these minor, frequent conflicts tend to increase the amount of stress experienced in day-to-day life (Arnett, 1999; Kohn, Lafreniere, & Gurevich, 1991; Taylor, 1991).

Adolescence also appears to be a time characterized by frequent mood

disruptions. Studies that have investigated mood have found that adolescents do indeed report greater extremes of mood and more frequent changes of mood, compared with preadolescents or adults (Arnett, 1999). In addition, several longitudinal studies have found that negative affect increases from preadolescence to adolescence (Buchanan, Eccles, & Becker, 1992). Larson and Richards (1994) have proposed that this increase in mood disruptions is due to cognitive and environmental factors rather than pubertal changes. Their research has demonstrated only a small relationship between pubertal stage and mood disruptions. Alternately, they suggest that the transition into adolescence brings forth "newly developed capacities for abstract reasoning allowing them to see beneath the surface of situations and envisioning hidden and more long-lasting threats to their well-being" (p.86). Larson and Richards emphasize that adolescents are more likely to encounter multiple life changes and personal transitions, such as the onset of puberty, changing schools, and beginning to date, which contribute to mood disruptions. However, they argue that it is not just that adolescents experience stressful events, but how they perceive and interpret these events, that contribute to their mood disruptions: even in response to identical or similar situations, adolescents report more extreme and negative moods than preadolescents or adults.

Finally, research shows high prevalence rates of risk behaviors (i.e. behavior that carries the potential for harm to self and/or others) in adolescents, especially in Western countries. Risk behaviors can include crime, substance abuse, risky automobile driving, and risky sexual behavior. Specifically, empirical evidence suggests that crime rates increase in adolescence, peaking at 18 years of age (Gottfredson & Hirschi, 1990). Moreover, rates of most types of substance abuse are at their highest at about age 20 (Johnston, O'Malley, & Bachman, 1994). The rate of automobile accidents and fatalities

peaks in the late teens (U.S. Department of Transportation, 1995), and the rates of sexually transmitted diseases (STDs) peak in late adolescence and the early twenties (Stein, Newcomb, & Bentler, 1994).

In sum, the adolescent period is characterized by an increase in conflicts with authority, negative mood, and risk behaviors (Arnett, 1999). Research in adolescents has shown that worries in this age group are related to daily hassles (Spruijt-Metz & Spruijt-Metz, 1997). Kohn and Milrose (1993) define hassles as "mundane irritants and sources of stress that people commonly encounter in everyday life". Since adolescents report frequent conflicts with parents and authority figures on a daily basis, adolescents may be at increased risk for worry when compared to children. Frequent mood disruptions may also be associated with increased worry. For example, research suggests that there is a strong relationship between anxiety and depression in children and adolescence (Cole, Lachlan, Martin, Truglio, & Seroczynski, 1998). Given that adolescents are more likely to report more extreme and negative moods than preadolescents or adults, it follows that adolescents are at least as likely, if not more likely, to worry in comparison with their younger and older counterparts. Finally, as already mentioned, adolescents are more likely to engage in risk behaviors. Given the definition of worry, adolescents may be more likely to worry due to the fact that risky behaviors primarily involve events which entail an increased possibility of potentially threatening consequences, along with outcomes that are largely uncertain.

Worry and Cognitive Development in Adolescence

As mentioned previously, the separation of generalized anxiety into two categories in the DSM-III-R resulted in a division between the study of generalized anxiety in children, in adolescents, and in adults (Berstein & Borchardt, 1990). This

division not only obscured the common origin of OAD and GAD, but prevented researchers from examining the development of worry across the lifespan. In fact, developmental factors appear to play an important role in the etiology of excessive worry. Studies of worry in childhood have suggested that the development of certain cognitive abilities appears to be necessary in order to worry. In general, it is postulated that children become increasingly capable of mediating severe, generalized anxiety through worry as their cognitive abilities develop (Vasey, 1993).

At least two cognitive abilities seem to be necessary to support the cognitive process of worrying (Vasey, 1993). First, the worrier must be able to envision, anticipate, or conceptualize future events. Second, the worrier must be capable of going beyond what is directly observable and elaborate on catastrophic possibilities. Because worry is fundamentally an anticipatory process, its occurrence and complexity depend on the extent to which children are able to reason about the future. Empirical evidence indicates that, prior to 7 or 8 years of age, children have a relatively modest ability to conceptualize the future (Ames, 1946; Piaget & Inhelder, 1966; Wallace & Rabin, 1960). Research also shows that at around eight years old, there appears to be a dramatic increase in anticipatory capabilities (Ames, 1946; Piaget & Inhelder, 1966). However, it is only in adolescence that the individual's formal reasoning develops, allowing them to understand the future in an abstract way, and anticipate the many potential outcomes of an ever-increasing variety of situations; these are the abilities that are needed to fully maintain the worrying process (Wallace & Rabin, 1960).

As children develop the ability to conceptualize the future, their perception of anxiety-provoking situations change (Vasey, 1993). For example, Magnusson and colleagues conducted a series of studies assessing the temporal characteristics of

appraisals of personally relevant situations in a sample of Swedish and Hungarian 12-, 15-, and 18-year-olds (Magnusson & Olah, 1981; Magnusson & Stattin, 1981, Stattin & Magnusson, 1981). Results showed that when explaining why they perceive certain situations to be anxiety-provoking, preadolescents (12-year-olds) relied on negative consequences that are temporally near, whereas older adolescents (15- and 18-year-olds) referred more frequently to temporally distant threats. In a related study with the same sample, Stattin (1984) showed that preadolescents classify anxiety-provoking situations on the basis of perceptually salient stimulus properties (i.e. situations that share a common trigger object), whereas older adolescents organized them primarily on the basis of latent, anticipatory characteristics (i.e. situations that share a common consequence). These results support the theory that the ability to conceptualize future events increases from childhood to adolescence.

It is postulated that increased ability to conceptualize a multitude of negative consequences will have an effect on the frequency and severity of worry (Vasey, 1993). This perspective predicts both an increase in the prevalence of Generalized Anxiety Disorder as well as an increase in worry as children develop (Vasey, 1993). Some support for this theory comes from recent data on the prevalence of child and adolescent anxiety disorders. In 1988, Kashani and Orvaschel investigated prevalence rates of anxiety disorders in a community sample of 150 adolescents aged 14 to 16 years old. Results showed that the most frequently occurring anxiety disorder was OAD. This in contrast to findings in pre-adolescents that the most frequently occurring diagnosis is Separation Anxiety Disorder (Anderson, Williams, McGee, & Silva, 1987). Results from this study also concluded that OAD was the least reported anxiety disorder in pre-adolescence. In 1990, Kashani and Orvaschel examined the prevalence of OAD in a sample of 210

children and adolescents in three age groups: 8 year-olds, 12 year-olds, and 17 year-olds. Findings revealed that the prevalence of OAD increased across age groups (age 8 = 8.6%, age 12 = 11.4%, age 17 = 17.1%). Similarly, Last and her colleagues (1987) found a higher prevalence of OAD among postpubertal compared to prepubertal children and adolescents aged 5 to 18. There is also some evidence that worry increases as children and adolescents develop. Specifically, Strauss and colleagues (1988) found that individuals older than 12 years of age scored significantly higher on worry measures than younger children. Taken together, these findings suggest that developmental differences exist in the prevalence of excessive worry in children and adolescence.

In summary, adolescence can be a time of storm and stress, and a period during which adolescents possess the cognitive ability to conceptualize future events and elaborate on catastrophic possibilities. Despite the logical link between stressful adolescent life events and worry, research on adolescent worry remains scarce.

Models of Excessive Worry and GAD in Adults

The Penn State Model of Excessive Worry

Because few empirical studies have examined worry in adolescents, current theorists draw heavily upon adult research (Vasey, 1993). Several theoretical models have attempted to explain worry in adults. The Penn State group has been highly involved in the study of the nature and function of worry. They suggest that the central characteristic of worry involves internal verbal-linguistic activity, i.e. a mental script (Borkovec, 1994). For example, one study examined the proportion of thought, imagery, or a combination of these two, experienced by adults during worry. Results showed that of 900 women, 51% reported a predominance of thought, 3% reported a predominance of imagery, and 46% reported a mixture. Similarly, when 300 male and female college students were asked to choose

between thought and imagery (using a forced choice format), 70% reported more thought, whereas 30% reported more imagery (Borkovec & Lyonfields, 1993). Evidence for a predominance of thought over imagery is also found in individuals with GAD. One study conducted by Borkovec and Inz (1990) compared GAD clients to non-anxious controls. Results revealed that during laboratory periods of self-relaxation and worry, relaxed controls reported a predominance of imagery whereas GAD clients reported an equal amount of thoughts and images. However, when asked to worry about their most current pressing concern, both groups reported an increase in thought and a decrease in mental imagery. Furthermore, after treatment, GAD clients reported a proportion of thoughts and images similar to non-clinical controls. The results of these studies have led the Penn State group to propose that the verbal content of worry functions primarily as a cognitive avoidance response to fear-provoking imagery.

Worry also appears to be negatively reinforced by a decrease in aversive somatic activation. Laboratory data has shown that subjects who worry show less heart rate response to aversive imagery than subjects who engage in either relaxed or neutral thinking (Borkovec & Hu, 1990). Research has also demonstrated that worry inhibits cardiovascular reactions (Borkovec, Lyonfields, Wiser, & Deihl, 1993). Similar results were also found in clinical samples. Physiological assessments of GAD patients and matched non-anxious controls revealed that individuals with GAD have a significantly greater restriction in heart-rate variability (Friedman, Thayer, Borkovec, & Lyonfields, 1993). Results also show that when parasympathetic control was examined independent of sympathetic activity, clients displayed a significant deficiency in variability in parasympathetic tone when compared to controls. Subsequent to therapy, these clients demonstrated an increase in variability and parasympathetic tone similar to the non-

anxious controls. Borkovec (1994) concludes that GAD and excessive worry are characterized by a certain degree of sympathetic inhibition and a resulting autonomic inflexibility. Therefore, an individual who suffers from GAD will have produced thoughts about a currently non-existent future threat. Borkovec (1994) likens their reaction to a fear involving "fight-or-flight with no place to go", and that the individual essentially "freezes" when no effective avoidance response is readily available.

Because worry leads to less flexibility in autonomic activity, the worry process results in an interference with emotional processing (Borkvec & Hu, 1990). Although the mechanisms by which worry inhibits emotional processing are unknown, it is hypothesized that worrying decreases attentional resources for processing other information, prevents the shifting of attention from excessive thought activity, insulates worry content from the rest of its associative network, and decreases the chance for detecting a mismatch between information expected and perceived. For example, a study conducted by Butler, Wells, and Dewick (1995) required subjects to view a distressing film about an accident. Subjects were asked to either worry "verbally" about the film, visualize images from the film, or to "settle down" during a four minute period. Results demonstrated that, in contrast to the imagery group, the worry group showed decreased anxiety at the end of the worry period, but experienced more intrusive images about the movie in the three days subsequent to the experiment. Similarly, research has shown that verbally articulating emotional material has little cardiovascular effect when compared to imagery (Vrana, Cuthbert, & Lang, 1986). However, as stated above, worry primarily involves verbal-linguistic thinking (Borkovec & Inz, 1990). According to Foa and Kozak (1986), emotional processing will only occur if all aspects of meaning, including the physiological/affective features, are accessed and experienced. Therefore, as long as an

individual avoids threatening information, the threatening meaning of a stimulus will be preserved and extinction will not occur.

To summarize, Borkovec and his colleagues conceptualize worry as a mainly verbal-linguistic process that functions as a means of avoiding potentially threatening images. This decrease in imagery has the effect of reducing autonomic activity, and because emotional processing requires full-network activation (Foa & Kozak, 1986), the meaning of the threatening stimuli, and, in turn, the worry, will be maintained (Borkovec, 1994).

The London Model of Excessive Worry. Tallis and Eysenck (1994) have also proposed a conceptualization of excessive worry. Essentially, their model incorporates three stages: (1) threat appraisal, (2) worry activation, and (3) coping. The first stage examines the factors involved in the appraisal of threat. These include personal cost, imminence, likelihood, and estimated self-efficacy. Tallis and Eysenck postulate that threats are anticipated events located in the future. Since the outcomes of future events are unknown, they propose that all threats contain an element of uncertainty until they actually occur. Therefore, awareness of distal threats increases opportunities for worry. In this model, a key distinction is made between primary appraisal (an estimate of threat significance) and secondary appraisal (an estimate of coping resources). Primary appraisal of threat is determined by estimates of cost, imminence and likelihood. In general, the cost associated with threat is determined by the number and importance of goals affected, as well as the degree to which these goals can be achieved. Moreover, the more imminent a threat is, the more intense and uncontrollable worry will be. Finally, they suggest that high worriers often overestimate the likelihood of negative events. Therefore, an event that is determined to be imminent, likely, and capable of interfering with one or more

valued goals will be construed as threatening. However, worry may not be initiated if a secondary appraisal suggests that the individual's coping resources match or exceed the demands of the stressor. Tallis and Eysenck suggest that an individual's perceived level of self-efficacy can increase or decrease the emotional impact of a negative primary appraisal. Therefore, the individual's self-efficacy beliefs play an important role in the appraisal of threatening events.

The second stage of Tallis and Eysenck's (1994) model focuses on the individual's response to threat recognition. In essence, Tallis and Eysenck postulate that worry serves to warn the individual that a threat exists and prepares them for future dangers. In addition, they propose that worry leads to an unfocused attentional style (i.e. by constantly scanning the environment for potential threats), increased sensitivity to emotional information, and increased arousal (which produces self-absorption). Therefore, high worriers constantly scan the environment for potential threats. Since high worriers appear to be sensitive to emotional information in general, cognitive processing resources are preferentially allocated to the early detection of these potentially threatening events. Increases in arousal also focus the individual's attention on the content of worry (especially self-relevant worries). Thus, a high worrier will be particularly self-absorbed if attention has an internal focus. It is hypothesized that the processes involved in this stage produce a negative mood state which may increase worry frequency and contribute further to the accessibility of negative information.

Finally, the third stage of Tallis and Eysenck's (1994) model considers the maintenance of worry. It is suggested that poor problem solving can account for the preservation of threat and subsequent worry maintenance. The longer it takes to solve a problem, the longer worry will persist. Tallis and Eysenck (1994) propose that the

negative mood state caused by threat appraisal interferes with effective problem solving. Moreover, worry activation may interrupt the flow of thinking necessary for problem solving. In addition, even though an individual is aware of problem solving strategies, problem solving may be delayed if the individual is unable to select a suitable coping strategy. The authors contend that elevated evidence requirements may account for the individual's indecision. Several studies have indicated that worriers require more evidence than non-worriers when making a decision (Tallis, 1989; Tallis, Eynseck, & Mathews, 1991). In 1989, Tallis demonstrated that when assigning words to different categories based on worry content, high worriers showed slower response times than low worriers. Responding was particularly slow for high worriers when assigning ambiguous words. Similarly, Tallis and colleagues (1991) found that when subjects were asked to perform a letter-search task, high worriers showed significant response delays on target-absent trials compared to low worriers. Therefore, the more ambiguous a task, the longer it will take a worrier to select a coping strategy. Since most problems have various solutions, solving a problem usually means that the individual has to choose between many possible courses of action. Because a high worrier requires more evidence on which to base a decision, the worrier may simply fail to select an effective strategy because they feel they have insufficient information, thus delaying resolution of the problem. The failure to select a strategy will sustain not only the threat the worrier feels, but the worrying itself.

In sum, the model of worry developed by Tallis and Eysenck (1994), describes worry within the broader context of anxiety. They propose that evaluations of threats in terms of imminence, likelihood, and cost in relation to perceived self-efficacy is a relatively automatic response. They postulate that worry functions as an alarm that alerts

the individual to a potential threat. Worry thus leads to an unfocused attentional style, increased sensitivity to emotional material, and increased self-absorption. Finally, worry is maintained by inappropriate problem solving as well as elevated evidence requirements.

The Manchester Model of Excessive Worry. Wells (1995, 1997) has proposed an alternative cognitive model of excessive worry highlighting the role of meta-cognition. The first step in the model is the notion of potential triggers. These triggers refer to negative intrusive thoughts. For example, after hearing about a traffic accident an individual may think "what if my partner is involved in an accident" (Wells, 1997). In response to these triggers, pathological worriers develop positive beliefs about the advantages of using worrying as a coping strategy. The individual subsequently engages in "type 1" worry as a way of generating possible solutions. Type 1 worry is defined as "worrying about external events and non-cognitive internal events such as physical symptoms". Wells asserts that although type 1 worry increases anxiety in the short-term, anxiety eventually decreases as solutions to the anticipated catastrophes are found. In this model, pathological worriers also develop negative beliefs about worrying, appraising worry as uncontrollable and dangerous. Once established, the model predicts that the individual will develop "type 2" worry or meta-worry, which is essentially worry about worry. Following the presence of type 2 worry, three sets of processes are activated which contribute to the presence of generalized, uncontrollable worry: behavior, thought control, and emotion. Because the person negatively appraises worrying, behaviors are engaged which are intended to avert the dangers of worrying. These behaviors include avoidance of particular anxiety-provoking situations, reassurance seeking, and the use of distracting activities. However, these behaviors maintain type 2 worry and negative beliefs about

worry. Specifically, avoidance of situations diminishes the available opportunities for discovering that type 1 worries are inaccurate, thereby maintaining the individuals' preoccupation with the triggering situations. Similarly, reassurance seeking prevents the individual from discovering that worrying can be voluntarily controlled. The use of direct thought control strategies also maintain type 2 worry. In particular, pathological worriers tend to suppress thinking about worry triggers. However, research shows that thought suppression actually leads to a resurgence of unwanted thoughts, thus reinforcing meta-worries concerning loss of control (Wegner, Schneider, Carter, & White, 1987). Finally, anxiety increases when type 2 worries are activated. Wells (1995, 1997) postulates that excessive worriers use their emotions as cues to whether it is safe to terminate worry activity. Thus, these "emotional symptoms" are interpreted as evidence supporting type 2 worry and negative beliefs. It is further hypothesized that a feedback route exists from emotion back to type 1 worry, and that reductions in emotion reinforces the subsequent execution of type 1 worrying when future threat appraisals occur.

In summary, the central feature of this model is the distinction between type 1 and type 2 worry. Although the model predicts that pathological worry is correlated with both types of worry, type 2 is seen as the main factor involved in the escalation and generalization of worry. Results from one study found that excessive worry was directly associated with type 2, but not type 1 worry, supporting Wells' hypothesis that meta-worry is indeed the main process variable involved in pathological worry (Wells & Carter, 1999).

The Present Study: The Laval Model of Excessive Worry

The current study is based on a cognitive-behavioral model of excessive worry developed by Dugas, Gagnon, Ladouceur, and Freeston (1998). This empirically based

model incorporates many of the cognitive variables proposed by the models presented above. In sum, this model posits that four fundamental processes are associated with the development and maintenance of excessive worry: intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance.

Intolerance of uncertainty is defined as the excessive tendency of an individual to consider it unacceptable that a negative event may occur, however small the probability of its occurrence (Dugas, Gosselin, & Ladouceur, in press). Although several of the models mentioned above note that uncertainty plays a role in the development of worry, this model holds that intolerance of uncertainty is the key process variable involved in the development and maintenance of excessive and uncontrollable worry. Several recent studies have found support for this theory. In 1997, Dugas and his colleagues found that intolerance of uncertainty was related to worry, independent of anxiety and depression levels. Dugas et al. (1998) further examined the relationship between worry and intolerance of uncertainty when they conducted a preliminary study of their conceptual model of GAD. Results demonstrated that intolerance of uncertainty was the most important component in distinguishing GAD patients from non-clinical controls. Since excessive worry is the primary diagnostic criterion of GAD, this study supports the theory that intolerance of uncertainty is the most important variable involved in worry. Similarly, Lachance, Ladouceur and Dugas (1999) showed that not only did intolerance of uncertainty predict the tendency to worry, but it had the greatest effect on worry, above and beyond demographic and other worry-related process variables (beliefs about worry and cognitive avoidance). Ladouceur, Gosselin, and Dugas (in press) extended this research by demonstrating that worry could be increased or decreased experimentally by manipulating levels of intolerance of uncertainty. Research suggests that intolerance of

uncertainty elicits worry because high worriers have difficulty tolerating the fact that life does not offer many guarantees. Therefore, high worriers tend to exaggerate highly improbable situations. As suggested above, high worriers also have elevated evidence requirements when making a decision (Tallis, 1989; Tallis & Eysenck, 1994). This is related to uncertainty in that the worrier simply needs more evidence in order to be "certain" about the outcome of their decisions. Therefore, intolerance of uncertainty can lead to worry in two ways. First, individuals who are intolerant of uncertainty often overestimate the probability of occurrence of highly remote events. Second, even when individuals who are intolerant of uncertainty make accurate estimates, they continue to worry because these events "could still happen" (Dugas et al., 1997).

Beliefs about worry are also an important factor involved in excessive worry (Dugas et al., 1998; Wells, 1995, 1997). Beliefs about worry can be divided into positive and negative beliefs. For instance, many people believe that worrying can lead to positive outcomes such as finding better solutions to problems, increasing motivation, preventing and minimizing negative outcomes, helping to cope with fear and anxiety, and distracting oneself from emotionally distressing topics (Borkovec & Roemer, 1995; Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). Alternately, many people believe that worrying has negative consequences, such as increasing pessimism, exaggerating problems, impairing performance, increasing emotional discomfort, and making them "go crazy" (Cartwright-Hatton & Wells, 1997; Davey, Tallis, & Cappuzo, 1996; Wells, 1997). The model proposed by Dugas et al. (1998) focuses primarily on positive beliefs about worry.

Overall, studies show that non-clinical high worriers believe that worrying is more useful than do moderate and low worriers (Freeston et al., 1994). Furthermore, research

has confirmed that both positive and negative beliefs about worry are associated with the tendency to worry (Cartwright-Hatton & Wells, 1997; Davey et al., 1996; Wells & Papageorgiou, 1998). For example, Davey et al. (1996) investigated the relationship between positive and negative beliefs about worry and the tendency to worry in a non-clinical sample. As expected, participants reported both positive and negative beliefs about the consequences of worrying. Findings also indicated that scores on both positive and negative beliefs about worry were significantly correlated with measures of psychopathology. A recent study conducted by Holowka, Dugas, Francis, and Laugesen (2000) attempted to clarify the role of beliefs about worry in the development and maintenance of worry. The results indicated that for the overall sample, both positive and negative beliefs about worry were significantly correlated to excessive worry. Therefore, as worry increased, subjects reported more positive and negative beliefs about the consequences of worry.

Until recently, the specificity of this association remained unclear. In other words, do both positive and negative beliefs about worrying demonstrate a unique association with excessive worry, independent of anxiety in general? An investigation into the specificity of positive and negative beliefs about worry was recently conducted by Stöber (2000). Results indicated that positive beliefs about worry showed a unique relationship to excessive worry relative to anxiety, whereas negative beliefs appeared to be non-specific. Stöber concluded that positive beliefs about worry play an integral role in the development and maintenance of excessive and chronic worry, whereas negative beliefs may simply be the result or a consequence of excessive worry.

Excessive worry has also been shown to relate to social problem solving. According to D'Zurilla, Nezu, and Maydeau-Olivares (1997), an individual's problem-

solving ability can be assessed on five dimensions: (1) positive problem orientation, (2) negative problem orientation, (3) rational problem-solving, (4) impulsivity and carelessness, and (5) avoidance. Problem orientation refers to a set of metacognitive processes that reflect awareness and appraisal of everyday problems, and one's own problem-solving ability (Maydeu-Olivares & D'Zurilla, 1996). Problem orientation includes problem perception, attribution, and appraisal, as well as personal control beliefs and emotional responses (Nezu, Nezu, D'Zurilla, & Friedman, 1996). Problem orientation can be further subdivided into two categories: positive and negative problem orientation. Positive problem orientation can be defined as a constructive, problem-solving cognitive set, characterized by a general tendency to view problems as challenges, the belief that problems are solvable, as well as the belief that one has the ability to solve their problems successfully and effectively (D'Zurilla, Nezu, & Maydeau-Olivares, 1997). On the other hand, negative problem orientation is described as a negative or dysfunctional cognitive set involving the tendency to appraise problems as threats, to view problems as unsolvable, to doubt that one has the ability to solve problems, and to become frustrated and upset when problems arise. D'Zurilla and his colleagues (1997) propose that positive and negative problem orientation are not diametrically opposed along a single problem-orientation dimension, nor are they mutually exclusive. Rather, they suggest that they are two distinct constructs that can, and often do, co-exist.

Conversely, problem-solving skills can be defined as the rational, systematic and skillful application of effective problem-solving strategies. Problem-solving skills include problem definition and goal formulation, generation of alternative solutions, decision making, and solution implementation and verification. Impulsivity/carelessness is a deficient problem-solving style characterized by impulsive attempts to solve problems.

Finally, avoidance is described as an inefficient problem-solving style marked by procrastination, passivity, and dependency.

Research indicates that worry is not significantly related to knowledge of problem-solving skills. Rather, worry appears to be correlated with poor problem-solving confidence and poor perceived control over the problem-solving process (Davey, 1994). In fact, studies show that adults who worry excessively have a negative problem orientation (Davey, 1994; Davey et al., 1996; Dugas, Freeston, & Ladouceur, 1995; Dugas, Freeston, & Ladouceur, 1997). In addition, as already mentioned, high worriers require more evidence on which to base a decision, thus delaying reaching decisions when problem solving. In 1995, Dugas, Letarte, Rhéaume, Freeston, and Ladouceur hypothesized that worry would be negatively correlated to problem solving, and that cognitive and affective factors would play a more important role than behavioral deficits in limiting problem-solving ability. The results of their study demonstrated that worry was related to problem orientation but not to problem-solving skills, and this, regardless of mood state. Together, these findings indicate that worry is associated with negative problem orientation, regardless of actual problem-solving skills.

Finally, cognitive avoidance has been identified as being a key process variable in the etiology of worry. Cognitive avoidance is an element of worry that appears in other models as well, including Wells' (1995) and Borkovec's (1994). However, Borkovec and Wells conceptualize cognitive avoidance in slightly different ways. As mentioned previously, Borkovec (1994) views cognitive avoidance as the automatic process of suppressing threatening mental imagery. Evidence for this comes from research which indicates that worry is primarily composed of thoughts rather than images. Specifically, high worriers report a preponderance of thoughts over images when worrying. It is

hypothesized that people who worry excessively tend to replace negative images with thoughts, and that these are maintained via negative reinforcement. On the other hand, Wells (1995) proposes that high worriers tend to suppress thinking about worry triggers. In other words, they use effortful strategies in order to suppress unwanted thoughts (i.e. thought suppression). There are several problems with suppressing one's thoughts. First, it activates a monitoring process that ironically increases accessibility of the unwanted thought (Wegner & Zanakos, 1994). In other words, the more an individual attempts to suppress a thought, the more they are likely to think about it. This is called the "enhancement effect". Another consequence of suppressing one's thoughts is that even if the thought is initially suppressed (i.e. in the short term), the thought is likely to be enhanced in the long term. This is called the "rebound effect". Therefore, thought suppression is a relatively ineffective strategy and ultimately maintains worrisome thoughts. The Laval research group is beginning to conceptualize cognitive avoidance as a combination of these two factors. Specifically, the Laval Model (1998) proposes that excessive worriers may use both voluntary strategies in order to avoid unwanted thoughts, as well as involuntary suppressing threatening mental images.

In sum, investigations with adults have found that intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance are related to the tendency to worry. Although the findings obtained with adult samples may be relevant to adolescent worry, this certainly cannot be assumed to be true. To date, several studies suggest that some of the processes underlying adolescent worry are indeed similar to those involved in adult worry.

The Laval Model in Adolescence

A preliminary study conducted by Lemay et al. (1997) examined the relationship

between worry and beliefs about worry and cognitive avoidance in an adolescent sample. Findings revealed that adolescent high worriers believe that worrying is more useful than do adolescent moderate worriers. Furthermore, the findings suggested that adolescent beliefs about worry were divided into two major categories. The first was that worrying is useful in helping them find effective solutions to problem situations. This belief is maintained through periodic positive reinforcement when, on occasion, they indeed are able to find solutions to their problems after worrying about them. The second was that they believe that worrying prevents and minimizes negative outcomes. The latter is maintained via negative reinforcement when highly improbable events, such as failing a course, do not occur when the adolescent has worried about it. Finally, results showed that, similar to adults, adolescent high worriers use significantly more avoidance strategies than do adolescent moderate worriers. Surprisingly, both high and moderate worriers reported that these avoidance strategies are useful (Freeston et al., 1997) although research indicates they are not (Wegner & Erber, 1992). These findings provide some preliminary evidence that positive beliefs about worry and cognitive avoidance may be key components for understanding the etiology of excessive worry in adolescents. However, further research is needed in order to more clearly elucidate their respective roles.

A recent study (Leblanc, Powers, Kelley, Hope, & Waschbusch, 1999) investigated the role of problem-solving skills and orientation in an adolescent sample. Findings indicated that negative problem orientation and avoidance were significantly related to worry, even after anxiety and demographic variables were controlled for. Rational problem solving and positive problem orientation were not significant predictors of worry. These results support the hypothesis that adolescent worry is related to negative

problem orientation, independent from actual problem-solving skills.

However, little is known about the relationship between adolescent worry and intolerance of uncertainty. As mentioned previously, although these processes have been empirically confirmed in adults, it would be a mistake to assume that they generalize to adolescent worry. Clearly, more extensive research is needed in order to clarify the relationship between adolescent worry and the cognitive processes described by Dugas and his colleagues (1998).

The goal of the present study is to explore the relationship between adolescent worry and intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance. Three hypotheses are proposed. First, it is hypothesized that every process variable will make a significant and unique contribution to the prediction of worry. Second, it is it is predicted that the four process variables will contribute to the discriminant function and that the discriminant function would be effective in classifying moderate and high worriers into their respective groups. Third, it is hypothesized that intolerance of uncertainty will make the most important contribution to the prediction of worry and will be the most important variable in discriminating between groups.

Method

Participants

Participants were 528 adolescents between the ages of 14 and 18. The mean age of the sample was 15.55 years (SD = .92). This sample included 269 males and 259 females in grades 9 (37.7%) and 10 (62.3%). Participants were recruited on a voluntary basis from two French high schools in Montreal (65.8%) and LaSalle (34.2%). Seventy-two percent of subjects reported French as their first language. Students were from a diverse ethnic background, but mainly from Canadian (48.7%), European (13.1%), Caribbean (12.5%), and Asian (8.0%) groups.

Measures

The Penn State Worry Questionnaire for Children (PSWQ-C; Chorpita, Tracey, Brown, Collica, & Barlow, 1997) contains 14 items measuring the tendency to worry in children aged 6 to 18 (see appendix A). Responses are rated on a 4-point Likert-type scale, ranging from 1 ("not at all typical of me") to 4 ("very typical of me"). Internal consistency estimates are excellent (α= .90), and convergent and discriminant validity are sufficient. Test-retest reliability at one week is good (r = .92). The French translation (QIPS-EA; Gosselin, Tremblay, Laugesen, Dugas, & Ladouceur, 1999) is also unifactorial, has adequate test-retest reliability at 5 weeks (r = .67), excellent internal consistency (α= .88), and adequate convergent and discriminant validity. The Penn State Worry Questionnaire for Children was derived from the adult version (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990; translation: Ladouceur et al., 1992). However, in order to make subscales appropriate for children and adolescents, several items were either omitted or reworded to be readable at approximately the second grade level.

The Worry and Anxiety Questionnaire (WAQ; Dugas, Freeston, Lachance,

Provencher, & Ladouceur, 1995) consists of 11 items assessing worry themes and DSM-IV diagnostic criteria for GAD (see appendix B). For the purposes of this study, only the 6 items measuring GAD physical symptoms were used. Items are rated on a 9-point Likert-type scale, ranging from 0 ("not at all") to 8 ("very severely"). The French version of the WAQ demonstrates adequate test-retest reliability at four weeks ($r = .76$) (Beaudoin et al., 1997) and has good psychometric properties in the adolescent population (Fournier, 1997).

The Intolerance of Uncertainty Scale (IUS; Freeston et al., 1994) is a 27-item measure relating to the idea that uncertainty is unacceptable, reflects badly on a person, and leads to frustration, stress, and the inability to take action (see appendix C). All items are rated on a 5-point Likert-type scale, ranging from 1 ("not at all characteristic of me") to 5 ("entirely characteristic of me"). The French version of the IUS shows excellent internal consistency ($\alpha = .91$) and demonstrates criterion-related, convergent and discriminant validity (Freeston et al., 1994). Test-retest reliability is adequate at five weeks ($r = .78$) (Dugas et al., 1997).

The Why Worry-II (WW-II; Langlois et al., 1999) questionnaire is a 25 item scale measuring beliefs about worry (see appendix F). All items are rated on a 5-point Likert-type scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The French version demonstrates high internal consistency ($\alpha = .93$). Exploratory factor analysis suggests five types of beliefs, including problem solving, motivation, prevention of negative emotions, magical thinking, and personality trait.

The Social Problem-Solving Inventory –Revised Short Form (SPSI-RSF; D'Zurilla, et al., 1997) is a 25 item, multidimensional measure assessing social problem-solving ability (see appendix D). It was adapted from the SPSI (SPSI; D'Zurilla & Nezu,

1990), which consists of 70 items. All items are rated on a 5-point Likert-type scale, ranging from 0 ("not at all typical of me") to 4 ("very typical of me"). The five subscales are: Positive Problem Orientation, Negative Problem Orientation, Rational Problem Solving, Impulsivity/Carelessness Style, and Avoidance Style. Each subscale contains 5 items. Since research has shown that negative problem orientation (NPO) is the main problem-solving variable involved in worry (Davey, 1994), only the NPO subscale will be examined in this study.

The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) consists of 15 items measuring the tendency to suppress unwanted thoughts (see appendix E). All items are rated on a 5-point Likert-type scale, ranging from 0 ("strongly disagree") to 4 ("strongly agree"). It shows evidence of both convergent and divergent validity and has adequate test-retest reliability (r = .69-.92) (Wegner & Zanakos, 1994). The French translation (Letarte, Ladouceur, Freeston, & Rhéaume, 1997) shows excellent internal consistency (α = .87). Although preliminary investigations suggested a unifactorial measure of thought suppression, recent analyses point to the presence of two factors: (1) actual thought suppression; and (2) lack of control over thoughts. Given that lack of control may be confounded with GAD symptoms, and therefore worry, only the first factor, actual thought suppression, was retained for analyses (items 1, 8, 10, 11, 12, 13, 15).

Procedure

Participants were tested in their classrooms during regular school hours. Students were informed about the confidentiality of their answers and the voluntary nature of the study. Students who participated in the study signed a consent form (see Appendix G) and completed several questionnaires in French. A General Information sheet (see Appendix

H) was included in order to obtain demographic information, such as age, grade, gender, and cultural background. All questionnaires were identified by a code number to preserve participant anonymity. The administration of the test batteries took approximately 45 minutes, during which an experimenter was available to answer questions (i.e. about meaning or vocabulary). The testing session was followed up with a question and answer period, which lasted approximately 15 minutes.

Results

Data Screening

Prior to analysis, the data were examined for accuracy of data entry, missing values, univariate and multivariate outliers, linearity, singularity, homoscedacity, and fit between their distributions and the assumptions of multivariate analysis. In order to insure accuracy of data files, raw data scores were entered twice, compared, and when needed, corrected upon checking the data sheets.

In order to detect the presence of univariate outliers, standardized scores were computed. Using the criteria set by Tabachnick and Fidell (1996), cases with standardized scores over 3.29 or under –3.29 were considered outliers. Using this criteria, one case was identified as a univariate outlier because of it's extremely high score on the intolerance of uncertainty measure. This case was deleted from subsequent analyses. Further, using Mahalonobis distance with $p < .001$, one case was identified as a multivariate outlier. This case was also removed from further analyses.

The data were then examined for normality, pairwise linearity, multicollinearity, and singularity. No departures from normality were detected. Scatterplots showed a linear relationship between all variables, and tolerance levels indicated that none of the variables were either singular or multicollinear.

Analyses

Zero-order correlations were first computed using the total scores from the demographic variables and for each of the measures. The correlation matrix is presented in Table 1. The results showed that the intercorrelations between measures were neither too high for a regression model nor too low for a MANCOVA. The findings also suggested that gender was significantly correlated to scores on the PSWQ-C, and should

Table 1

Correlation Matrix of Variables

Variables	PSWQ-C	Age	Gender[a]	Cultural Group	Language	School
PSWQ-C	--	.03	-.22***	.05	-.03	.07
Age		--	.15***	.06	.12**	.12**
Gender [a]			--	-.01	.01	-.02
Cultural group				--	.40***	.27***
Language					--	.27***
School						--
WAQ (Somatic symptoms)						
IUS						
WW-II						
SPSI-R-SF (Neg. prob. orientation)						
WBSI (Thought suppression)						

[a] coded so that lower values indicate female gender and higher values indicate male gender

*p<.05 **p<.01 ***p<.001

Note: PSWQ-C: Penn State Worry Questionnaire; WAQ: Worry and Anxiety Questionnaire (Somatic Anxiety subscale); IUS: Intolerance of Uncertainty Scale; WW-II: Why Worry – II Questionnaire; SPSI-R-SF: Social Problem-Solving Inventory – Revised Short Form (Negative Problem Orientation subscale); WBSI: White Bear Suppression Inventory (Thought Suppression)

Table 1 (Continued)

Correlation Matrix of Variables

Variables	WAQ (Somatic symptoms)	IUS	WW-II	SPSI-R-SF (Neg. prob. orientation)	WBSI (Thought suppression)
PSWQ-C	.50***	.66***	.42***	.61***	.36***
Age	-.03	.08	-.01	.00	.03
Gender [a]	-.23***	-.07	.12**	-.20***	-.16***
Cultural grp	-.06	.01	.10*	.03	.04
Language	-.05	-.03	-.08	-.01	.00
School	-.07	.08	.10*	.06	.08
WAQ (Somatic symptoms)	--	.46***	.22***	.48***	.29***
IUS		--	.52***	.64***	.37***
WW-II			--	.37***	.27***
SPSI-R-SF (Neg. prob. orientation)				--	.38***
WBSI (Thought suppression)					--

[a] coded so that lower values indicate female gender and higher values indicate male gender

*p<.05 **p<.01 ***p<.001

Note: PSWQ-C: Penn State Worry Questionnaire; WAQ: Worry and Anxiety Questionnaire (Somatic Anxiety subscale); IUS: Intolerance of Uncertainty Scale; WW-II: Why Worry – II Questionnaire; SPSI-R-SF: Social Problem-Solving Inventory – Revised Short Form (Negative Problem Orientation subscale); WBSI: White Bear Suppression Inventory (Thought Suppression)

thus be controlled for in further analyses. Specifically, adolescent girls scored significantly higher than boys on the measure of worry. However, neither age, cultural group, or school were significantly correlated to scores on the PSWQ-C, and thus were not controlled for in subsequent analyses. The mean and standard deviation were also calculated for each of the study's measures and are presented in Table 2.

A series of partial correlations for all process variables was then performed, first partialling out the effects of gender, and then partialling out the effects of gender and somatic anxiety scores. Tables 3 and 4 present the partial correlation coefficients for all measures. Results indicated that all cognitive process measures were significantly correlated with the tendency to worry as measured by the PSWQ-C and remained significant when the partial correlations were re-calculated with somatic anxiety partialled out as well. As expected, the highest correlation observed in both correlation matrices was between intolerance of uncertainty and worry. In addition, results showed that all the process measures (intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance) were all significantly correlated to each other.

A multivariate hierarchical regression, predicting the tendency to worry (PSWQ-C), was performed to further examine the relationship between worry and the four process variables. Demographic variables (e.g., age, gender, and school) and somatic anxiety symptoms as measured by the WAQ were entered on the first and second steps respectively, in order to control for the variance accounted for by these factors. Although age and school were not significantly correlated to scores on the PSWQ-C, they were included in the first step of the regression in order to have a more comprehensive test. The process variables were entered in the last stage. Table 5 summarizes the results of

Table 2

Mean Scores on All Measures

Measure	n	M	SD
PSWQ-C	518	32.43	7.43
WAQ (Somatic symptoms)	509	20.01	9.45
IUS	509	64.00	19.10
WW-II	508	56.25	16.61
SPSI-R-SF (Negative prob. orientation)	514	8.71	4.34
WBSI (Thought suppression)	512	23.15	5.54

Note: PSWQ-C: Penn State Worry Questionnaire; WAQ: Worry and Anxiety Questionnaire (Somatic Anxiety subscale); IUS: Intolerance of Uncertainty Scale; WW-II: Why Worry – II Questionnaire; SPSI-R-SF: Social Problem-Solving Inventory - Revised Short Form (Negative Problem Orientation subscale); WBSI: White Bear Suppression Inventory (Thought Suppression)

Table 3

Partial Correlation Matrix Controlling for Gender

Variables	PSWQ-C	WAQ (Somatic Symptoms)	IUS	WW-II	SPSI-R-SF (Neg. prob. orientation)	WBSI (Thought suppression)
PSWQ-C	--	.52***	.66***	.44***	.59***	.33***
WAQ (Somatic symptoms)		--	.48***	.26***	.48***	.38***
IUS			--	.52***	.63***	.36***
WW-II				--	.39***	.27***
SPSI-R-SF (Neg. prob. orientation)					--	.36***
WBSI (Thought suppression)						--

*p<.05 **p<.01 ***p<.001

Note: PSWQ-C: Penn State Worry Questionnaire; WAQ: Worry and Anxiety Questionnaire (Somatic Anxiety subscale); IUS: Intolerance of Uncertainty Scale; WW-II: Why Worry – II Questionnaire; SPSI-R-SF: Social Problem-Solving Inventory - Revised Short Form (Negative Problem Orientation subscale); WBSI: White Bear Suppression Inventory (Thought Suppression)

Table 4

Partial Correlation Matrix Controlling for Gender and Somatic Anxiety Symptoms

Variables	PSWQ-C	IUS	WW-II	SPSI-R-SF (Neg. prob. orientation)	WBSI (Thought suppression)
PSWQ-C	--	.56***	.37***	.48***	.25***
IUS		--	.48***	.53***	.29***
WW-II			--	.33***	.22***
SPSI-R-SF (Neg. prob. orientation)				--	.28***
WBSI (Thought suppression)					--

*p<.05 **p<.01 ***p<.001

Note: PSWQ-C: Penn State Worry Questionnaire; IUS: Intolerance of Uncertainty Scale; WW-II: Why Worry – II Questionnaire; SPSI-R-SF: Social Problem-Solving Inventory – Revised Short Form (Negative Problem Orientation subscale); WBSI: White Bear Suppression Inventory (Thought Suppression)

Table 5

Summary of Hierarchical Multiple Regression Analysis for Variables Predicting PSWQ-C (N=484)

Variables	ΔR^2	B	SE B	β
Step 1	.06***			
Age		.57	.37	.07
Gender		-3.31	.66	-.22***
School		1.21	.71	.08
Step 2	.23***			
WAQ		.38	.03	.50***
Step 3	.26***			
WW-II		.04	.02	.09*
WBSI (Thought suppression)		.06	.05	.04
SPSI-R-SF (Neg. prob. orientation)		.39	.07	.23***
IUS		.14	.02	.36***

*p<.05 **p<.01 ***p<.001

Note: PSWQ-C: Penn State Worry Questionnaire; WAQ: Worry and Anxiety Questionnaire (Somatic Anxiety subscale); IUS: Intolerance of Uncertainty Scale; WW-II: Why Worry – II Questionnaire; SPSI-R-SF: Social Problem-Solving Inventory – Revised Short Form (Negative Problem Orientation subscale); WBSI: White Bear Suppression Inventory (Thought Suppression)

this analysis. At the first step, gender made a significant contribution to the prediction of worry scores, accounting for 6 % of the variance of worry scores. Somatic anxiety symptoms, which were entered on the second step, also made a significant contribution to the prediction of worry scores, accounting for 23% of the variance. In the last step, the set of process measures as a whole made a significant contribution to the prediction of worry, explaining an additional 26% of the variance in worry scores. Perusal of individual beta weights revealed that three of the cognitive process measures made a unique and significant contribution to the prediction of worry: the IUS, the WW-II, and the Negative Problem Orientation subscale of the SPSI-R-SF. Only the WBSI, which measures thought suppression (a form of cognitive avoidance), did not make such a contribution.

A multivariate analysis of covariance (MANCOVA) was then conducted to determine the effect of level of worry (moderate and high) on the four process variables, after adjusting for differences on two covariates (gender and somatic anxiety symptoms). Participants were divided into two groups: subjects who scored between the 40^{th} and 60^{th} percentile on the PSWQ-C composed the moderate worry group ($\underline{n} = 124$), whereas subjects who scored at or above the 80^{th} percentile on the PSWQ-C constituted the high worry group ($\underline{n} = 114$). The moderate worry group had a mean score of 31.82 ($\underline{SD} = 1.35$) on the PSWQ-C whereas the high worry group had a mean score of 42.85 ($\underline{SD} = 4.38$). The results of the MANCOVA indicated that that the groups differed on a combination of the four process variables, Wilks' $\Lambda = .79$, $\underline{F}\ (4,231) = 15.07$ $p < .001$. The multivariate η based on Wilks' Λ was quite strong, .21.

Subsequently, a discriminant function analysis (DFA) was conducted to determine whether intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance could predict membership in the two worry groups

(moderate and high). The overall Wilks' lambda was significant, $\Lambda = .70$, χ^2 (4, $\underline{N} = 238$) = 92.674, $p < .001$, indicating that as a whole, the predictors differentiated among moderate and high worriers. The loading matrix of correlations between predictors and discriminant functions can be seen in Table 6. By convention (Tabachnick & Fidell, 1996), correlations in excess of .33 (10% of the variance) may be considered eligible while the lower ones cannot. Therefore, loadings less than .33 did not significantly contribute. Results suggested intolerance of uncertainty was the variable that contributed the most to the discriminant function. Negative problem orientation also effectively separated the two groups. However, positive beliefs about worry and cognitive avoidance did not contribute to the discriminant function. Caution should be taken when interpreting these loadings, however, because they are full, not partial correlations. Therefore, the loadings could be different if correlations with other predictors were partialled out.

The discriminant validity of the four key process variables were further investigated by attempting to classify subjects into their respective groups (moderate vs high worriers) by using the discriminant function determined from these four variables. When trying to predict group membership, 72.8% of the original grouped cases were correctly classified. The kappa value, which corrects for chance agreement, was .46. One limitation of DFA is that classification can be biased when the coefficients used to assign a case to a group are derived, in part, from that case. Although taken into consideration, this limitation was less of a concern due to the large sample size.

Table 6

Discriminant Analysis: Intolerance of Uncertainty, Positive Beliefs about Worry, Negative Problem Orientation, and Cognitive Avoidance (Thought Suppression)

Variables	Total Canonical Structure	Standardized Canonical Coefficients
Intolerance of uncertainty	.95	.82
Positive beliefs about worry	.25	-.03
Negative problem orientation	.72	.34
Cognitive avoidance (Thought suppression)	.22	-.07

Discussion

In 1998, Dugas and his colleagues developed a cognitive model of excessive worry which posits that four process variables are related to the tendency to worry: intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance. The main purpose of the present study was to explore the relationship between worry and these cognitive processes in an adolescent sample. The first hypothesis, which predicted that each of the four process variables would make a significant and unique contribution to the prediction of worry, was partially supported. The second hypothesis, which proposed that the four process variables would contribute to the discriminant function and that the discriminant function would be effective in classifying moderate and high worriers into their respective groups, was also partially supported. The third hypothesis, which postulated that intolerance of uncertainty would make the most important contribution to the prediction of worry and would be the most important variable in discriminating between moderate and high worry groups, was supported.

Prediction of Adolescent Worry

As mentioned above, the first hypothesis examined whether intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance could predict worry in adolescence. This hypothesis was partially supported. Specifically, the data indicated that the 4 process variables as a whole significantly predicted worry and explained a good portion of the variance in worry, above and beyond demographics and anxiety symptoms. The results also showed that intolerance of uncertainty, positive beliefs about worry, and negative problem orientation all made

unique contributions to the prediction of worry. Accordingly, the more an adolescent overestimates the probability of a negative event occurring regardless of the actual probability of that event, the more an adolescent believes that worrying is useful, and the more an adolescent views problems as threats that are unsolvable, the more likely that adolescent will worry. Furthermore, results showed that intolerance of uncertainty contributed the most to the prediction of worry. Thus, knowledge of these three process variables, especially knowledge of intolerance of uncertainty, can help predict level of worry in adolescents. These results are consistent with previous research in adults which indicate that these process variables are highly useful in the prediction of worry (Dugas et al., 1997).

Unexpectedly, cognitive avoidance, although positively correlated with the tendency to worry, did not make a unique contribution to the prediction of worry. There are several possible explanations for this finding. First, this study used the WBSI (Wegner & Zanakos, 1994) in order to measure cognitive avoidance. However, the WBSI is a measure of thought suppression, which is only one component of cognitive avoidance. As mentioned previously, there are two elements to cognitive avoidance: a voluntary component and an involuntary component. The voluntary component is an effortful strategy to suppress unwanted thoughts (i.e. thought suppression), whereas the involuntary component is the automatic process of suppressing threatening mental imagery. Given that the WBSI only measures the voluntary component of cognitive avoidance, the WBSI may simply not have been an adequate measure. Future studies may be more successful in targeting cognitive avoidance with the Cognitive Avoidance Questionnaire (CAQ; Langlois et al., 1996), a new instrument specifically designed to measure cognitive avoidance as it relates to worry. However, the same basic pitfall

remains. Specifically, the difficulty lies in assessing automatic responses to threatening mental imagery. Because this response is automatic, many individuals may simply not be aware that they are engaging in this process. Despite this inherent difficulty in targeting cognitive avoidance, given that the CAQ is a more focused measure of cognitive avoidance, the latter may emerge as a stronger predictor of worry than it appeared in this study.

Second, this finding also raises the possibility that cognitive avoidance may simply not add to the prediction of worry once the other process variables are taken into account. Research with adults show that the relationship between worry and cognitive avoidance is not as strong as the relationships between worry and intolerance of uncertainty or negative problem orientation (Dugas et al., 1998). Because of the high correlations between the four cognitive processes, one explanation for the small contribution of cognitive avoidance is that the variance explained by cognitive avoidance may be predictable from the other process variables. In other words, although cognitive avoidance may be involved in the development and maintenance of worry in adolescence, it may not make a unique contribution once the variance of intolerance of uncertainty and negative problem orientation is accounted for. This is certainly possible given the high associations between intolerance of uncertainty and negative problem orientation to worry in this sample. Therefore, a large part of the variance accounted for by cognitive avoidance, as measured in this study, may be subsumed under intolerance of uncertainty and negative problem orientation.

Discrimination Between Moderate and High Adolescent Worriers

The second hypothesis explored whether the four cognitive variables measured in

this study would contribute to a discriminant function and whether this discriminant function would be effective in classifying moderate and high worriers into their respective groups. This hypothesis was also partially supported. Results showed that the moderate and high worry groups differed on a combination of the four process variables. In addition, the predictors as a whole contributed significantly to the discriminant function, thus successfully differentiating between moderate and high adolescent worriers. When assessing the contribution of each process measure to the discriminant function, the findings demonstrated that the variables which best distinguished between moderate and high worriers were intolerance of uncertainty and negative problem orientation. Finally, the discriminant function derived from the four process variables was effective in classifying moderate and high worriers into their respective groups. These results suggest that intolerance of uncertainty and negative problem orientation are crucial in order to effectively discriminate between moderate and high worriers as well as to classify them into their respective groups. Thus, high worriers are more likely to overestimate the probability of a negative event occurring, and are more likely to view their problems as threats than moderate worriers.

Positive beliefs about worry did not contribute significantly to the discriminant function. A recent study conducted by Holowka and colleagues (2000) have attempted to clarify the role of beliefs about worry in adult worry. This study indicated that, for the overall sample, both positive and negative beliefs about worry were significantly related to excessive worry. Therefore, as worry increased, so did positive and negative beliefs about worry. However, Holowka and his colleagues (2000) also found that positive and negative beliefs demonstrated differential effects depending on the level of worry. More specifically, positive beliefs were more highly correlated to worry in the low worry group

compared to negative beliefs. For high worriers, the opposite was true: negative beliefs were more highly related to the tendency to worry than positive beliefs. Finally, positive and negative beliefs contributed equally to worry in moderate worriers. In sum, positive beliefs appear to be more sensitive to changes in worry at low levels of worry, whereas negative beliefs appear to be more sensitive to changes in worry at high levels of worry. One possible explanation for these findings is that since low worriers don't worry frequently, individuals' within the low worry group believe that on the rare occasion when they do worry, worrying is useful, whereas few individuals have the opportunity to experience the negative consequences of worry. Since moderate worriers worry occasionally, they may believe that although worrying can sometimes be useful, it can also have negative consequences, such as worrying decreasing performance and causing the person anxiety. Finally, although most high worriers report an increase in both positive and negative beliefs about worry, negative beliefs are more sensitive to changes within this range of the spectrum. Thus, because high worriers worry often, they are more likely to experience the negative consequences of worry, whereas there is more variability in the degree to which high worriers believe that worry is useful. The finding that positive beliefs about worry are less sensitive at the high end of the spectrum may account for the results found in this study. Therefore, future research should focus on the role of positive beliefs about worry at lower levels of adolescent worry. In addition, given the findings of Holowka et al. (2000), future research should assess the role of negative beliefs about worry in adolescents. However, as mentioned previously, it is unclear whether negative beliefs are involved in the development of excessive and uncontrollable worry, or are simply a consequence of worry.

The findings also demonstrate that negative problem orientation discriminates

between moderate and high worriers. Therefore, high worriers appear to have a poorer problem orientation when compared to moderate worriers. This is consistent with previous research that adolescent worry is related to negative problem orientation regardless of actual problem-solving skills (Leblanc et al., 1999). Given the frequency at which adolescents encounter difficulties in their day-to-day lives (Arnett, 1999), some adolescents may feel overwhelmed and be unable to implement appropriate problem solving strategies. Since intolerance of uncertainty and negative problem orientation are strongly related to each other, intolerance of uncertainty may contribute to negative problem orientation, which subsequently leads to worry. Thus, selectively attending to uncertain aspects of a problematic situation may contribute to viewing the problem as a threat. If the adolescent views the problem as unsolvable, they may delay implementing a solution. And, as postulated by Tallis and Eysenck (1994), the longer it takes to solve a problem, the longer the individual will ruminate over the possible choices, and the longer worry will remain intrusive.

Finally, the data showed that cognitive avoidance did not discriminate between moderate and high adolescent worriers. This is not surprising given that cognitive avoidance did not predict level of worry above and beyond sociodemographic variables and somatic anxiety symptoms. Although cognitive avoidance may simply not play a role in differentiating between moderate and high worriers, the more probable explanation is that the questionnaire used, the WBSI (Wegner & Zanakos, 1994), does not measure both the voluntary and involuntary aspects of cognitive avoidance. However, the results of this study do suggest that effortful strategies to suppress unwanted thoughts alone do not differentiate between moderate and high worriers. Therefore, future studies should examine the discriminating ability of both components of cognitive avoidance in order to

see whether the components combined differentiate between moderate and high worriers.

In sum, these findings suggest that intolerance of uncertainty and negative problem orientation should be assessed in order to identify and discriminate adolescents who worry occasionally from adolescents who may suffer from excessive and uncontrollable worry. Although this study does not show whether these variables appear before or after the development of worry, preliminary data with adult samples suggest that intolerance of uncertainty may be a marker for excessive and uncontrollable worry (Dugas & Ladouceur, 1999; Ladouceur et al., in press). Therefore, targeting these variables either though treatment or prevention may reduce excessive and uncontrollable worry in adolescents.

The Role of Intolerance of Uncertainty in Adolescent Worry

While the process variables as a whole made some unique contributions to the prediction of worry, and discriminated to some extent between moderate and high worriers, the one outstanding finding of this study was the relationship between intolerance of uncertainty and adolescent worry. The third hypothesis, which proposed that intolerance of uncertainty would make the most important contribution to the prediction of worry and would be the most important variable in discriminating between groups, was supported. Findings across all the analyses in this study indicated that intolerance of uncertainty is a key cognitive process underlying adolescent worry. Specifically, partial correlations revealed that intolerance of uncertainty was highly correlated to worry when demographics and somatic anxiety symptoms were statistically controlled. Similarly, the multivariate hierarchical regression showed that intolerance of uncertainty was the strongest predictor of worry, above and beyond demographics and

somatic anxiety symptoms. Furthermore, results from the discriminant function analysis suggested that intolerance of uncertainty was the variable that best distinguished between moderate and high worriers. In other words, the results of this study suggest that a high level of adolescent worry is related to intolerance of uncertainty. Therefore, intolerance of uncertainty can help predict level of worry in adolescents as well as help identify and discriminate between moderate and high worriers.

Given the strong relationship between intolerance of uncertainty and worry that was found in this study, an important consideration is whether these two constructs are, in fact, distinct. In other words, is intolerance of uncertainty simply another way of describing worry? Previous research has found similar correlations between intolerance of uncertainty and worry in adults ($\underline{r} = 0.70$, Dugas et al., 1997; $\underline{r} = 0.63$, Freeston et al., 1994). A recent study by Ladouceur, Talbot, and Dugas (1997) examined whether intolerance of uncertainty and worry are truly different constructs. Findings show that intolerance of uncertainty in adults is correlated to the perception of performance on ambiguous tasks, but worry is not. Similarly, research in adults has shown that although gender is related to worry, it is not related to intolerance of uncertainty (Robichaud, Dugas, & Conway, 1999). The present study found comparable results with adolescents. Specifically, this study revealed gender differences in levels of worry: adolescent girls reported higher levels of worry than adolescent boys. However, there were no gender differences for intolerance of uncertainty. The conclusion that can be drawn from this is that intolerance of uncertainty and worry are unique constructs.

The data presented thus far substantiates previous research suggesting that intolerance of uncertainty and worry are truly distinct constructs that are strongly related, and that this relationship holds true for adolescents. The question that remains is: how are

they related to each other? It may be that intolerance of uncertainty predisposes an individual to worry. Research in adults has shown that worry can be increased or decreased experimentally by manipulating levels of intolerance of uncertainty (Ladouceur et al., in press). Moreover, treatment process studies reveal that changes in intolerance of uncertainty precede changes in worry in adults with GAD (Dugas & Ladouceur, in press). Therefore, although more research is needed in order to clarify the nature of the relationship between intolerance of uncertainty to worry in adolescents, given the findings shown in adults, it is likely that intolerance of uncertainty leads to worry in adolescents.

In order get a better picture of how intolerance of uncertainty might lead to worry, consider the following example. A female high school student, "Clara", has just been told that she has a Chemistry exam in two weeks. Clara is a good student, who usually studies hard and does well on exams. However, Clara has never taken a course in Chemistry before. In addition, Clara is intolerant of uncertainty. Thus, she finds it unacceptable that she may fail this test. Even though she is a good student and usually succeeds, she becomes preoccupied with the fact that there is a slight chance that something terrible will occur (e.g., "What if there isn't enough time to finish the exam? What if I forget to answer a question that is worth a lot of marks? What if the questions are tricky and I don't know how to answer them? Maybe I'm not studying the right chapters? What if the alarm doesn't go off in the morning and I sleep through the exam?"). Clara is so fearful of the possibility of doing poorly, that she begins to engage in certain behaviors. For instance, Clara feels uncertain about her ability to understand the material, and avoids studying until the last minute. Clara also creates artificial obstacles (e.g., "I can't study right now because I have to clean my room and I can't study when it's messy."). She is unable to delegate tasks to others (e.g., "I have a group lab assignment due on the same

day, and I can't trust anyone else to do it properly."). She constantly seeks reassurance from others (e.g., "Oh my God, I don't know anything, I am so behind in my studying! Do you think I have studied enough?"). In addition, her manner of studying is scattered, so she is constantly worried that she has forgotten to study something, and keeps changing her focus ("I will study this now, or maybe I should study that now and leave this until later."). Finally, she begins to doubt the decisions that she has already taken (e.g. studying the class notes first and the assigned chapters after) because she is unsure what the best strategy is. Consequently, her intolerance of uncertainty makes her feel uneasy, anxious, and stressed. In sum, because Clara is intolerant of uncertainty, she is overestimating the occurrence of a highly improbable event (her failing an exam when she rarely does poorly), and worries because failing "could happen". On the other hand, Clara's classmate "Beverly" is also a good student, but she is tolerant of uncertainty. Beverly realizes that, given her success in other courses, it is unlikely that she will fail. Therefore, she acknowledges that there are things she cannot control and doesn't spend time worrying about it. The time that Beverly spends studying is more realistic, she begins studying earlier, and she experiences less stress.

As can be seen from the illustration above, intolerance of uncertainty plays an important role in sustaining the worry process. As suggested earlier, the cognitive ability to worry blossoms during adolescence (Vasey, 1993). The adolescent period is also replete with numerous life changes and personal transitions, all of which can elicit uncertainty. Clearly, adolescence is a time in which the individual encounters a large number of unfamiliar events whose outcomes are highly uncertain (Arnett, 1999). It may therefore be that the changes associated with adolescence, in their novelty and unpredictability, lead certain individuals to develop less tolerance for uncertain situations.

Thus, adolescence can be viewed as a period in which situational and cognitive factors are conducive to the development and maintenance of both intolerance of uncertainty and worry itself. However, because this study did not measure adolescent storm and stress, the number of personal transitions or life changes, future research should investigate the nature of the relationship between the four cognitive variables and environmental stressors.

The Development of Worry in Adolescence

At this point, it is only possible to speculate how intolerance of uncertainty could lead to worry in adolescents. Specifically, given that high adult high worriers require more evidence on which to base decisions, adolescent high worriers may also have elevated evidence requirements when making a decision (Tallis, 1989; Tallis & Eysenck, 1994). In other words, adolescents who are intolerant of uncertainty may simply need more evidence in order to be "certain" about the outcome of their decisions, thus sustaining worry. Consequently, intolerance of uncertainty probably leads to adolescent worry in two ways. The results of this study indicate that intolerance of uncertainty, positive beliefs about worry, negative problem orientation, and cognitive avoidance are highly correlated to one another. The results also show that each of these variables is correlated to worry. Although research has yet to determine whether these variables actually cause adolescent worry, it is hypothesized that these variables all work together in order to develop worry. If this is true, then how would they interact in order to produce adolescent worry? Although it is only possible to speculate at this time, the results of this study clearly indicate that intolerance of uncertainty is the key construct implicated in excessive and uncontrollable worry. Perhaps intolerance of uncertainty works in

conjunction with the other process variables in order to produce worry. Specifically, someone who is intolerant of uncertainty will tend to overestimate the likelihood of negative events occurring, regardless of the actual probability of these events. They may convince themselves that worrying will eliminate any element of surprise. In other words, individuals who are intolerant of uncertainty may convince themselves that by worrying, they will have thought of every possible solution to their problem. Thus, these individuals will believe that they have some control over the uncertain situation. In addition, people who are intolerant of uncertainty will become focused on the variety of possible negative outcomes, which could lead them to view their problems as threats, see them as unsolvable, and begin to doubt their ability to solve these problems. Therefore, their intolerance of uncertainty could cause them to develop a negative problem orientation. Further, individuals who are intolerant of uncertainty will have a need for some certainty, and may begin to look for cues in their environment that will give them some indication as to the best course of action. However, this also has the adverse effect of increasing their awareness of possible threats as well as increase the occurrence of threatening mental imagery. They may try to suppress these mental images, but this will only cause them to be more threatening. All of these variables cause the situation to be more upsetting to individuals who are intolerant of uncertainty because they prevent the emotional processing of their fears. Consequently, these individuals continue to worry and begin to worry excessively.

In sum, the results of this study suggest that intolerance of uncertainty may be a fundamental process implicated in the etiology of adolescent worry. Positive beliefs about worry and negative problem orientation also appear to be important constructs involved in the development of worry in adolescents. However, the role of cognitive avoidance in

the development and maintenance of adolescent worry remains unclear.

Limitations

An important caution should be applied to the results of the present study. Except for the PSWQ-C, which has been validated for adolescents, the questionnaires used in this study have only been validated in adult samples. Although research is beginning to outline important features in adolescent worry, there remains a lack of well-validated self-report measures of worry for children and adolescents (Chorpita et al, 1997). In fact, a review conducted by Vasey and Daleiden (1994) revealed that a significant number of measures of worry in children and adolescents demonstrate limited psychometric support and no validation in clinical samples. In addition, questionnaires need to be evaluated in order to determine the presence of problematic items, such as items that are too difficult or simply not relevant to adolescent samples. Any such items need to be either eliminated or simplified to an appropriate reading level for adolescents. Thus, empirical research is needed in order to determine the adequacy of these measures in adolescents.

Another limitation of this study is that although the data was collected exclusively in French high schools in the Montreal region, approximately one-third of the sample reported English as their first language. Thus, one important consideration is whether these individuals had difficulty understanding the items on the questionnaires. In addition, this study did not control for social desirability. Research has shown that social desirability can play a role in affecting responses on self-report questionnaires (Huang, Liao, & Chang, 1998). Specifically, a social desirability bias can result from the desire of responders to avoid embarrassment and project a favorable image to others. Therefore, some individuals may attempt to present themselves in the best possible light which can

significantly distort the information gained from self-reports (Fisher, 1993). Further, this study only used a self-report measure in order to determine level of worry; there were no peer, teacher, or parent ratings of worry and anxiety. Finally, although preliminary research has indicated that both adolescent storm and stress and developmental variables may be important in explaining adolescent worry, given that this study was a preliminary exploration into adolescent worry, the focus was primarily on cognitive process variables. Therefore, no conclusions can be made as to the possible role the developmental variables may have had in this study.

Future Directions

This study has important implications for the development and administration of worry prevention programs with adolescents. Specifically, although a worry prevention program should target these four cognitive variables, intolerance of uncertainty and negative problem orientation should be the primary targets. Recently, a pilot prevention program was carried out by Ladouceur, Tremblay, and Dugas (1999) with students in grades 8 and 9. The intervention focused solely on positive beliefs about worry and cognitive avoidance. Results suggested that the intervention had no effect on the tendency to worry, but was effective in reducing somatic anxiety symptoms. Given the findings of the present study, the efficacy of prevention programs could be greatly enhanced if intolerance of uncertainty and negative problem orientation are included in intervention programs.

Since research has shown that intolerance of uncertainty may be the primary construct underlying both adult and adolescent worry, it is possible that intolerance of uncertainty may have its roots in childhood development. If adolescents who are

intolerant of uncertainty become adults who are intolerant of uncertainty, then the same would be true for worry. Although no research has yet investigated whether adolescent worry predicts adult worry, preliminary data suggests that excessive worry in adults begins to develop in late adolescence (Dugas et al., 1998; Ladouceur, Freeston, Dugas, & Rhéaume, 1996; Rapee, 1991). Thus, more research is needed on the processes involved in the development of excessive and uncontrollable worry across the lifespan. If adolescent high worriers are the same individuals who become adult high worriers, and if intolerance of uncertainty remains the main construct contributing to worry in both age groups, then follow-up studies could be conducted in order to evaluate whether targeting intolerance of uncertainty in adolescence has an impact on worry prevalence rates in both adolescents and adults.

Concluding Remarks

As a whole, the results of this study suggest that the model developed by Dugas and his colleagues (1998) can be effectively applied to adolescent worry. Specifically, the findings indicate that adolescents who are intolerant of uncertainty, hold positive beliefs about worry, and who have a negative problem orientation may be at risk for developing excessive and uncontrollable worry. In addition, intolerance of uncertainty appears to represent the primary cognitive process involved in adolescent worry. However, the relationship between cognitive avoidance and worry remains unclear. As previously noted, caution should be taken when applying adult-based models to adolescents (Vasey, 1993). Because the ability to conceptualize worry changes as a function of age, it is particularly important for future research to address cognitive, social, and emotional development in adolescence as they relate to the cognitive characteristics described by the

model. Research suggests that adolescence is a period marked by changes in physical development, cognitive abilities, emotional adjustment, and self-esteem (Erikson, 1968). In addition, family life events and family dynamics have been found to play a significant role in the development of adjustment problems during this period (Kjell & Palmeruss, 1997), and may be important factors in explaining the development of worry in adolescents. Future studies could then focus on studying the interaction between worry, the four cognitive process variables mentioned above, and developmental factors in clinical adolescent populations (i.e. adolescent's diagnosed with Generalized Anxiety Disorder).

References

American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (Rev. 3rd ed.). Washington, DC: Author.

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

Ames, L.B. (1946). The development of the time sense in the young child. Journal of Genetic Psychology, 68, 97-125.

Anderson, J.C., Williams, S., McGee, R., & Silva, P.A. (1987). DSM-III disorders in preadolescent children: prevalence in a large sample from the general population. Archives of General Psychiatry, 44, 69-76.

Arnett, J.J.(1999). Adolescent storm and stress, reconsidered. American Psychologist, 54, 317-326.

Beaudoin, S., Tremblay, M., Carbonneau, C., Dugas, M.J., Provencher, M., & Ladouceur, R. (1997, October). Validation d'un instrument diagnostique pour le Trouble d'anxiété généralisée [Validation of a diagnostic instrument for Generalized Anxiety Disorder]. Poster presented at the annual convention of the Société québecoise pour la recherche en psychologie, Sherbrooke, Quebec.

Bell-Dolan, D.J., Last, C.G., & Strauss, C.C. (1990). Symptoms of anxiety disorders in normal children. Journal of the American Academy of Child and Adolescent Psychology, 29, 759-765.

Berstein, G.A., & Borchardt, C.M. (1990). Comparative studies on pharmacotherapy for school refusal. Journal of the American Academy Of Child and Adolescent Psychiatry, 146, 384-386.

Borkovec, T.D (1994). The nature, functions, and origins of worry. In G.C.L.

Davey and F. Tallis (Eds.), Worrying: perspectives on theory, assessment, and treatment, pp. 5-33. Chichester, England UK: John Wiley & Sons Ltd.

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., & Inz, J. (1990). The nature of worry in generalized anxiety disorder: A predominance of thought activity. Behaviour Research and Therapy, 28, 153-158.

Borkovec, T.D., & Lyonfields, J.D. (1993). Worry: Thought suppression of emotional processing. In H.W. Krohne (Eds.), Attention and avoidance, pp. 101-118. Seattle: Hogrefe & Huber Publishers.

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

Borkovec, T.D., & Roemer, L. (1995). Perceived functions of worry among generalized anxiety disorder subjects: Distraction from more emotionally distressed topics? Journal of Behavior Therapy and Experimental Psychiatry, 26, 25-30.

Borkovec, T.D., Lyonfields, J.D., Wiser, S. L., & Deihl, L. (1993). The role of worrisome thinking in the suppression of cardiovascular response to phobic imagery. Behaviour Research and Therapy, 31, 321-324.

Brown, J.M., O'Keefe, J., Sanders, S.H., & Baker, B. (1986) Developmental changes in children's cognition to stressful and painful situations. Journal of Pediatric Psychology, 11, 343-357.

Buchanan, C.M., Eccles, J.S., & Becker, J. (1992). Are adolescents the victims of raging hormones? Evidence for activational effects of hormones on mood and behavior at

adolescence. Psychological Bulletin, 111, 62-107.

Buchanan, C.M., Eccles, J.S., Flanagan, C., Midgley, C., Feldlaufer, H., & Harold, R.D. (1990). Parents' and teachers' beliefs about adolescents: Effects of sex and experience. Journal of Youth and Adolescence, 19, 363-394.

Butler, G., Wells, A., & Dewick, H. (1995). Differential effects of worry and imagery after exposure to a stressful stimulus: A pilot study. Behavioral Cognitive Psychotherapy, 23, 45-56.

Campbell, S.B. (1986). Developmental issues in childhood anxiety. In R. Gittelman (Ed.), Anxiety disorders of childhood, pp. 24-57. New York: Guilford Press.

Cartwright-Hatton, S., & Wells, A. (1997). Beliefs about worry and intrusions: The Meta-Cognitions Questionnaire and its correlates. Journal of Anxiety Disorders, 11, 279-296.

Chorpita, B.F., Tracey, S.A., Brown, T.A., Collica, T.J., & Barlow, D.H. (1997). Assessment of worry in children and adolescents: An adaptation of the Penn State Worry Questionnaire. Behaviour Research and Therapy, 35, 569-581.

Cole, D.A., Lachlan, G.P., Martin, J.M., Truglio, R., & Seroczynski, A.D. (1998). A longitudinal look at the relation between depression and anxiety in children and adolescents. Journal of Consulting and Clinical Psychology, 66, 451-460.

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

Davey, G.C.L., Tallis, F., & Cappuzo, N. (1996). Beliefs about the consequences of worrying. Cognitive Therapy and Research, 5, 499-520.

Dugas, M. J., Freeston, M. H., Lachance, S., Provencher, M., & Ladouceur, R. (1995, July). The Worry and Anxiety Questionnaire: Initial validation in non-clinical and

clinical samples. Poster presented at the World Congress of Behavioral and Cognitive Therapies, Copenhagen, Denmark.

Dugas, M.J., Freeston, M.H., & Ladouceur, R. (1995, October). Validation de mesures des mécanismes liés à l'inquiétude. [Validation of the mechanisms related to worry]. Poster presented at the annual convention of the Société québecoise pour la recherche en psychologie, Ottawa, Ontario.

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. (in press). Intolerance of uncertainty and worry: Investigating specificity in a nonclinical sample. Cognitive Therapy and Research.

Dugas, M.J., & Ladouceur, R. (in press). Treatment of GAD: Targeting intolerance of uncertainty in two types of worry. Behavior Modification.

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

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

D'Zurilla, T.J., Nezu, A.M., & Maydeu-Olivares, A. (1997). Manual for the Social Problem-Solving Inventory-Revised. North Tonawanda, N.Y.: Multi-Health Systems.

Eisen, A.R., & Silverman, W.K. (1998). Prescriptive treatment for Generalized Anxiety Disorder in children. Behavior Therapy, 29, 105-121.

Erikson, E. (1968). Identity, youth, and crisis. New York: W. W. Norton.

Fisher, R.J. (1993). Social desirability bias and the validity of indirect questioning. Journal of Consumer Research, 20, 303-315.

Foa, E.B., & Kozak, M.J. (1986). Emotional processing of fear: Exposure to corrective information. Psychological Bulletin, 99, 20-35.

Fournier, S. (1997) Worry themes and tendency to worry among a teenage sample. Non-published master's thesis, Laval University, Quebec City, Quebec, Canada.

Fournier, S., Freeston, M.H., Ladouceur, R., Dugas, M.J., & Guévin, M.C. (1996, August). Excessive worry and anxiety in junior and senior high school students. Poster presented at the International Society for the Study of Behavioral Development, Quebec, Quebec.

Freeston, M.H., Ladouceur, R., Gagnon, F., Thibodeau, N., Rhéaume, J., Letarte, H., & Bujold, A. (1997). Cognitive-behavioral treatment of obsessive thoughts: A controlled study. Journal of Consulting and Clinical Psychology, 65, 405-413.

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

Friedman, B.H., Thayer, J.F., Borkovec, T.D., & Lyonfields, J. (1993, May). Psychological assessment of generalized anxiety disorder. Paper presented at the Midwestern Psychological Association, Chicago.

Gosselin, P., Laberge, M., Lemay, D., Freeston, M.H., Langlois, F., & Ladouceur, R. (1998, June). Worry themes among adolescents. Poster presentation presented at the Canadian Psychological Association, Edmonton, Alberta.

Gosselin, P., Tremblay, M., Laugesen, N., Dugas, M.J., & Ladouceur, R. (1999, October). L'Inquiétude auprès des adolescents: Propriétés psychométriques d'une traduction française du Penn State Worry Questionnaire for children [Worry in adolescents: Psychometric Properties of the French version of the Penn State Worry Questionnaire for children]. Poster presented at the annual convention of the Société québecoise pour la recherche en psychologie, Quebec City, Quebec.

Gottfredson, M.R., & Hirschi, T. (1990). A general theory of crime. Stanford, CA: Stanford University Press.

Holowka, D.W., Dugas, M.J., Francis, K., & Laugesen, N. (2000, November). Measuring beliefs about worry: A psychometric evaluation of the Why Worry-II questionnaire. Poster presented at the annual conference of the Association for Advancement of Behavior Therapy, New Orleans, LO.

Huang, C., Liao, H., Chang, S. (1998). Social desirability and the clinical self-report inventory: Methodological reconsiderations. Journal of Clinical Psychology, 54, 517-528.

Johnston, L.D., O'Malley, P.M., & Bachman, J.G. (1994). National survey results on drug use from the Monitoring the Future study, 1975-1993. (NIH Publication No. 94-3810). Washington, DC: U.S. Government Printing Office.

Kashani, J.H., & Orvaschel, H. (1988). Anxiety disorders in mid-adolescence: A community sample. American Journal of Psychiatry, 145, 960-964.

Kashani, J.H., & Orvaschel, H. (1990). A community study of anxiety in children and adolescents. American Journal of Psychiatry, 147, 313-318.

Kauffman, K.L., Brown, R.T., Graves, K., Henderson, P., & Revolinski, M. (1993). What, me worry? A survey of adolescents' concerns. Clinical Pediatrics, 6, 8-14.

Kendall, P.C., Macdonald, J.P., & Treadwell, K.R.H. (1995). The treatment of anxiety disorders in youth. In A.R. Eisen, C.A. Kearney, and C.E. Schaefer (Eds.). Clinical handbook of anxiety disorders in children and adolescents (pp. 573-597). Northvale, NJ: Jason Aronson.

Kjell, R.N., & Palmerus, K. (1997). The influence of family factors on anxiety and depression in childhood and early adolescence. Adolescence, 32, 935-943.

Kohn, P.M., Lafreniere, K., & Gurevich, M. (1991). Hassles, health, and personality. Journal of Personality and Social Psychology, 61, 478-482.

Kohn, P.M., & Milrose, J.A. (1993). The inventory of high-school students' recent life experiences: A decontaminated measure of adolescent's hassles. Journal of Youth and Adolescence, 22, 43-55.

Lachance, S., Ladouceur, R., & Dugas, M.J. (1999). Eléments d'explication de la tendance à s'inquiéter. [Elements explaining the tendency towards uncertainty]. Applied Psychology: An International Review, 48, 187-196.

Ladouceur, R., Freeston, M.H., Dugas, M.J., & Rhéaume, J. (1996, October). Variables cognitives dans le développement et le traitement du Trouble obsessionnel-compulsif et du Trouble d'anxiété généralisée. [Cognitive variables involved in the development and treatment of Obsessive-Compulsive Disorder and Generalized Anxiety Disorder]. In S. Bouchard (Chair). La recherche sur les troubles anxieux au Québec. Symposium presented at the Société québecoise pour la recherche en psychologie, Trois-Rivières, Québec.

Ladouceur, R., Freeston, M.H., Dumont, J., Letarte, H., Rhéaume, J., Gagnon, F., & Thibodeau, N. (1992). Penn State Worry Questionnaire: Validity and reliability of a French translation. Canadian Psychology, 33, 236.

Ladouceur, R., Gosselin, P., & Dugas, M. J. (in press). Experimental manipulation of intolerance of uncertainty: A study of a theoretical model of worry. Behaviour Research and Therapy.

Ladouceur, R., Talbot, F., & Dugas, M. J. (1997). Behavioural expressions of intolerance of uncertainty in worry. Behavior Modification, 21, 355-371.

Ladouceur, R., Tremblay, M., & Dugas, M.J. (1999). La Prévention des inquiétudes chez les adolescents. [The prevention of anxiety in adolescents: Impact of a cognitive intervention]. Journal de Thérapie Comportmentale et Cognitive, 9, 67-73.

Langlois, F., Gosselin, P., Laberge, M., Tremblay, M., Leger, E., Provencher, M., & Ladouceur, R. (1999). Les Croyances érronées face aux inquiétudes: validation de la version révisée du questionnaire Pourquoi S'Inquiéter. (April, 1999). [Erroneous beliefs about worry: validation of the revised version of the Why Worry questionnaire]. Poster presented at the annual conference of the Association Francophone de Formation et de Recherche en Thérapie Comportementale et Cognitive, Lyon, France

Langlois, F., Lachance, S., Provencher, M., Freeston, M.H., Dugas, M.J., Fournier, S., Talbot, F., & Ladouceur, R. (1996, April). Le Questionnaire Évitement Cognitif: Analyses preliminaires. [Cognitive avoidance questionnaire: Preliminary analyses]. Poster presented at the annual conference of the Association Francophone de Formation et de Recherche en Thérapie Comportementale et Cognitive, Annecy, France.

Larson, R., & Richards, M.H. (1994). Divergent realities: The emotional lives of mothers, fathers, and adolescents. New York: Basic Books.

Last, C.G., Hersen, M., Kazdin, A.E., Finkestein, R., & Strauss, C.C. (1987). Comparison of DSM-III separation anxiety and overanxious disorders: Demographic characteristics and patterns of morbidity. Journal of the American Academy of Child and

Adolescent Psychiatry, 26, 527-531.

Leblanc, M.M., Powers, D.A., Kelley, M.L., Hope, T., & Waschbusch, D.A. (1999, November). The relationship between worry and social problem solving in adolescents. Poster presentation presented at the Association for Advancement of Behavior Therapy, Toronto, Ontario.

Lemay, D., Gosselin, P., Laberge, M., Freeston, M.H., Langlois, F., & Ladouceur, R. (1997, October). Inquiétudes chez les adolescents: évitement cognitif et croyances reliées à l'utilité des inquiétudes. [Adolescent worry: cognitive avoidance and beliefs about the usefulness of worry] Poster presented at the Société Québécoise pour Recherche en Psychologie. Sherbrooke, Québec.

Letarte, H., Ladouceur, R., Freeston, M.H., & Rhéaume J. (1997). Incentive to suppress a neutral thought. Behavioural and Cognitive Psychotherapy, 25, 219-229.

MacLeod, A.K., Williams, J.M.G., & Bekerian, D.A. (1991). Worry is reasonable: The role of explanations in pessimism about future personal events. Journal of Abnormal Psychology, 95, 15-20.

Magnusson, D. & Olah, A. (1981). Situation-outcome contingencies: A conceptual and empirical analysis of threatening situations. (Report No. 574). Stockholm, Sweden: Department of Psychology, University of Stockholm.

Magnusson, D., & Stattin, H. (1981). Situation-outcome contingencies: A conceptual and empirical analysis of threatening situations. (Report No. 571). Stockholm, Sweden: Department of Psychology, University of Stockholm.

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

Maydeu-Olivares, A. & D'Zurilla, T.J. (1996). A factor analysis of the Social

Problem-Solving Inventory using polychoric correlations. European Journal of Psychological Assessment, 11, 98-107.

McGuire, D.P., Mitic, W., & Neumann, B. (1987). Perceived stress in adolescents: What normal teenagers worry about. Canadian Mental Health, 35, 2-5.

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, 487-496.

Montemayor, R., & Hanson, E. (1985). A naturalistic view of conflict between adolescents and their parents and siblings. Journal of Early Adolescents, 5, 23-30.

Nezu, C. M., Nezu, A.M., D'Zurilla, T.J., & Friedman, S.H. (1996, November). Problem-solving assessment and therapy: Clinical practice applications. Workshop presented at the Annual Convention of the Association for the Advancement of Behavior Therapy. New York, NY.

Piaget, J., & Inhelder, B. (1966). The early growth of logic in the child. New York: Harper & Row.

Rapee, R.M. (1991). Generalized anxiety disorder: A review of clinical features and theoretical concepts. Clinical Psychology Review, 11, 419-440.

Robichaud, M., Dugas, M.J., & Conway, M. (1999, October). A preliminary investigation of the relationship between gender-role and worry. Poster presented at the annual conference of the Société quebecoise pour la recherche en psychologie, Montréal, Quebec.

Salkovskis, P. M., & Campbell, P. (1993). Thought suppression induces intrusion in naturally occurring negative intrusive thoughts. Behavioral Research Therapy, 32, 1-8,

Spruijt-Metz, D. & Spruijt-Metz, R. (1997). Worries and health in adolescence: A

latent variable approach.. Journal of Youth and Adolescence, 26, 485-501.

Stattin, H. (1984). Developmental trends in the appraisal of anxiety-provoking situations. Journal of Personality, 52, 46-57.

Stattin, H., & Magnusson, D. (1981). Situation-outcome contingencies: A conceptual and empirical analysis of threatening situations. (Report No. 580). Stockholm, Sweden: Department of Psychology, University of Stockholm.

Stein, J.A., Newcomb, M.D., & Bentler, P.M. (1994). Psychosocial correlates and predictors of AIDS risk behaviors, abortion, and drug use among a community sample of young adult women. Health Psychology, 13, 308-318.

Stöber, J. (1999). Positive beliefs about worrying are specific to chronic worry, negative beliefs are not. Manuscript submitted for publication.

Strauss, C.C., Lease, C.A., Last, C.G., & Francis, G. (1988). Overanxious disorder: An examination of developmental differences. Journal of Abnormal Child Psychology, 16, 433-443.

Tabachnick, B.G., & Fidell, L.S. (1996). Using Multivariate Statistics. (3rd ed.). New York: Harper Collins.

Tallis, F. (1989). Worry: A cognitive analysis. Unpublished doctoral dissertation. University of London.

Tallis, F., Davey, G.C.L., & Capuzzo, N. (1994). The phenomenology of nonpathological worry: A preliminary investigation. In G. C. L. Davey and F. Tallis (Eds.), Worrying: Perspectives on theory, assessment and treatment (pp. 61-89). New York: John Wiley and Sons.

Tallis, F., & Eynseck, M. (1994). Worry: Mechanisms and modulating influences. Behavioural and Cognitive Psychotherapy, 22, 37-56.

Tallis, F., Eynseck, M., & Matthews, A. (1991). Elevated evidence requirements and worry. Personality and Individual Differences, 12, 21-27.

Taylor, S.E. (1991). Health psychology (2nd ed.). New York: McGraw-Hill.

U.S. Department of Transportation. (1995). Understanding youthful risk taking and driving. (DOT Publication No. HS. 808-318). Springfield, VA: National Technical Information Service.

Vasey, M.W. (1993). Development and cognition in childhood anxiety: The example of worry. In T.H. Ollendick & J.R. Prinz (Eds.), Advances in Clinical Child Psychology, 15, pp.1-39. New York: Plenium Press.

Vasey, M.W., & Daleiden, E. (1994) Worry in children. In G.C.L. Davey and F. Tallis (Eds). Worrying: Perspectives on theory, assessment and treatment, pp. 184-207. Chichester, England UK: John Wiley & Sons.

Vrana, S.R., Cuthbert, B. N., & Lang, P. J. (1986). Fear imagery and text processing. Psychophysiology, 23, 247-253.

Wallace D.M., & Rabin, A.I. (1960). Temporal experience. Psychological Bulletin, 57, 213-236.

Wegner, D.M., & Erber, R. (1992). The hyperaccessibility of suppressed thoughts. Journal of Personality and Social Psychology, 63, 1-9.

Wegner, D.M., Schneider, D.J., Carter, S.R., & White, T.L. (1987). Paradoxical effects of thought suppression. Journal of Personality and Social Psychology, 53, 5-13.

Wegner, D.M., & Zanakos, S. (1994). Chronic thought suppression. Journal of Personality, 62, 615-640.

Wells, A. (1995). Meta-cognition and worry: A cognitive model of generalized anxiety disorder. Behavioural and Cognitive Psychotherapy, 23, 301-320.

Wells, A. (1997). Cognitive therapy of anxiety disorders. Chichester, UK: Wiley.

Wells, A., & Carter, K. (1999). Preliminary tests of a cognitive model of generalized anxiety disorder. Behaviour Research and Therapy, 37, 585-594.

Wells, A., & Papageorgiou, C. (1998). Relationships between worry, obsessive-compulsive symptoms, and meta-cognitive beliefs. Behaviour Research and Therapy, 36, 899-913.

Appendix A

Penn State Worry Questionnaire for Children and Adolescents (PSWQ-C)

QIPS-EA

Ce questionnaire est au sujet des inquiétudes. Les inquiétudes commencent lorsque vous avez peur de quelque chose et que vous y pensez souvent. Les gens s'inquiètent quelquefois à propos de leurs études, de leur famille, de leur santé, du futur, ou encore à propos de plusieurs autres choses.

Après chaque phrase, encerclez **le choix de réponse qui décrit le mieux** jusqu'à quel point l'énoncé est vrai pour vous.

1. Mes inquiétudes me dérangent vraiment.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

2. Je ne m'inquiète pas vraiment.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

3. Plusieurs choses m'amènent à m'inquiéter.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

4. Je sais que je ne devrais pas m'inquiéter, mais je n'y peux rien.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

5. Quand je suis sous pression, je m'inquiète beaucoup.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

6. Je m'inquiète toujours de quelque chose.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

7. Je trouve facile d'arrêter de m'inquiéter quand je le veux.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

8. Lorsque j'ai terminé une chose, je commence à m'inquiéter au sujet de toutes les autres choses.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

9. Je ne m'inquiète jamais.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

10. J'ai été inquiet tout au long de ma vie.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

11. Je remarque que je m'inquiète pour certains sujets.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

12. Quand je commence à m'inquiéter, je ne peux plus m'arrêter.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

13. Je m'inquiète tout le temps.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

14. Je m'inquiète des choses que j'ai à faire jusqu'à ce qu'elles soient terminées.

1	2	3	4
pas du tout vrai	un peu vrai	très vrai	extrêmement vrai

Chorpita, B.F., Tracey, S.A., Brown, T.A., Collica, T.J., & Barlow, D.H. (1997). Assessment of worry in children and adolescents: an adaptation of the Penn State Worry Questionnaire. Behaviour Research and Therapy, 35, 569-581. Traduction Laboratoire de thérapie behaviorale, Université Laval (1998).

Appendix B

The Worry and Anxiety Questionnaire (WAQ)

QIA som

---

1. Durant les quatre dernières semaines, jusqu'à quel point avez-vous été troublé-e par chacune des sensations suivantes lorsque vous étiez inquiet-ète ou anxieux-se? (Cotez chaque sensation à l'aide de l'échelle)

0 1 2 3 4 5 6 7 8

Aucunement Modérément Très sévèrement

____ Agité-e, surexcité-e ou avoir les nerfs à vif

____ Facilement fatigué-e

____ Difficulté à se concentrer ou blanc de mémoire

____ Irritabilité

____ Tensions musculaires

____ Problèmes de sommeil (difficulté à tomber ou rester endormi-e ou sommeil agité et insatisfaisant)

Dugas, M. J., Freeston, M. H., Lachance, S., Provencher, M., & Ladouceur, R. (1995, July). The Worry and Anxiety Questionnaire: Initial validation in non-clinical and clinical samples. Communication presented at the World Congress of Behavioural & Cognitive Therapies, Copenhagen, Denmark.

Appendix C

The Intolerance of Uncertainty Scale (IUS)

EII

Voici une série d'énoncés qui représentent comment les gens peuvent réagir à l'incertitude dans la vie. Veuillez utiliser l'échelle ci-dessous pour exprimer jusqu'à quel point chacun des énoncés suivants correspond à vous (écrivez le numéro 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	Tout à fait correspondant

1. ____ L'incertitude m'empêche de prendre position.
2. ____ Être incertain(e) veut dire qu'on est une personne désorganisée.
3. ____ L'incertitude rend la vie intolérable.
4. ____ C'est injuste de ne pas avoir de garanties dans la vie.
5. ____ Je ne peux pas avoir l'esprit tranquille tant que je ne sais pas ce qui va arriver le lendemain.
6. ____ L'incertitude me rend mal à l'aise, anxieux(se) ou stressé(e).
7. ____ Les imprévus me dérangent énormément.
8. ____ Ça me frustre de ne pas avoir toute l'information dont j'ai besoin.
9. ____ L'incertitude m'empêche de profiter pleinement de la vie.
10. ____ On devrait tout prévenir pour éviter les surprises.
11. ____ Un léger imprévu peut tout gâcher, même la meilleure des planifications.
12. ____ Lorsque c'est le temps d'agir, l'incertitude me paralyse.
13. ____ Être incertain(e) veut dire que je ne suis pas à la hauteur.
14. ____ Lorsque je suis incertain(e), je ne peux pas aller de l'avant.
15. ____ Lorsque je suis incertain(e), je ne peux pas bien fonctionner.
16. ____ Contrairement à moi, les autres semblent toujours savoir où ils vont dans la vie.

1	2	3	4	5
Pas du tout correspondant	Un peu correspondant	Assez correspondant	Très correspondant	Tout à fait correspondant

17. ____ L'incertitude me rend vulnérable, malheureux(se) ou triste.

18. ____ Je veux toujours savoir ce que l'avenir me réserve.

19. ____ Je déteste être pris(e) au dépourvu.

20. ____ Le moindre doute peut m'empêcher d'agir.

21. ____ Je devrais être capable de tout organiser à l'avance.

22. ____ Être incertain(e), ça veut dire que je manque de confiance.

23. ____ Je trouve injuste que d'autres personnes semblent certaines face à leur avenir.

24. ____ L'incertitude m'empêche de bien dormir.

25. ____ Je dois me retirer de toute situation incertaine.

26. ____ Les ambiguïtés de la vie me stressent.

27. ____ Je ne tolère pas d'être indécis(e) au sujet de mon avenir.

Appendix D

The Social Problem-Solving Inventory – Revised Short Form (SPSI-RSF)

IRPS-R

Voici une série d'énoncés décrivant certaines façons que vous pourriez penser, sentir et comporter lorsque vous faisiez face à des **PROBLEMES** de la vie quotidienne. Il **ne** s'agit **pas** de petits problèmes et des stress de tout les jours. Dans ce questionnaire, il s'agit de **PROBLEMES** importants dans votre vie qui vous dérange beaucoup mais que vous ne saviez pas immédiatement comment les améliorer où de les arrêter de vous déranger. Le problème peut être par rapport à vous-même (soit vos pensées, vos sentiments, votre comportement, votre apparence, où votre santé), vos relations avec les autres, (comme, par exemple, votre famille, vos amis, vos enseignants, vos employeurs) ou votre environnement et les choses que vous possédez (votre maison, votre auto, votre propriété, ou votre argent). S.V.P. lisez attentivement chaque énoncé et choisissez un des chiffres ci-dessous afin d'indiquer à quel point l'énoncé est vrai pour vous. Tenez compte de votre façon **habituelle** de penser, de sentir et de vous comporter lorsque vous êtes aux prises avec des problèmes de la vie quotidienne **ces jours-ci**. Inscrivez votre réponse sur la ligne à côté du numéro de l'énoncé.

0 = Pas du tout vrai dans mon cas
1 = Un peu vrai dans mon cas
2 = Modérément vrai dans mon cas
3 = Très vrai dans mon cas
4 = Extrêmement vrai dans mon cas

---

1. ____ Je me sens apeuré(e) lorsque j'ai des problèmes importants.

2. ____ Lorsque je prends des décisions, je ne vérifie pas assez soigneusement tous mes options.

3. ____ Je me sens incertain(e) de moi lorsque je prends des décisions importantes.

4. ____ Lorsque mes premiers efforts pour résoudre un problème échouent, je crois que si je ne lâche pas, je réussirai éventuellement.

5. ____ J'essaie de voir mes problèmes comme étant des défis.

6. ____ J'attends de voir si un problème disparaîtra avant d'essayer de le résoudre moi-même.

7. ____ Lorsque mes premiers efforts pour résoudre un problème échouent, je deviens très frustré(e).

8. ____ Je doute que je serai capable de résoudre des problèmes difficiles peu importe à quel point j'essaie.

0 = Pas du tout vrai dans mon cas
1 = Un peu vrai dans mon cas
2 = Modérément vrai dans mon cas
3 = Très vrai dans mon cas
4 = Extrêmement vrai dans mon cas

9. ____ Je crois que mes problèmes peuvent être solutionié.

10. ____ Je fais un effort particulier pour éviter de m'occuper de mes problèmes.

11. ____ Les problèmes difficiles me dérangent beaucoup.

12. ____ Lorsque je prends des décisions, j'essaie de prédire le pour et le contre de chaque option.

13. ____ J'aime m'occuper de mes problèmes aussitôt que possible.

14. ____ Lorsque je résout un problème, je suis la première bonne idée qui me vient à l'esprit.

15. ____ Je crois que je suis capable de résoudre les problèmes difficiles par moi-même si j'essaie suffisamment.

16. ____ Lorsque j'ai un problème, je vais chercher autant d'information que possible au sujet de ce problème.

17. ____ Je retarde à résoudre les problèmes le plus long temps possible.

18. ____ Je passe plus de temps à éviter mes problèmes qu'à les résoudre.

19. ____ Avant d'essayer de résoudre un problème, je me fixe un objectif pour que je saches exactement où je m'en vais.

20. ____ Lorsque je prends des décisions, je ne prends pas le temps de considérer le pour et le contre de chaque option.

21. ____ Après avoir appliqué une solution, je vérifie pour voir à quel point le problème s'est amélioré.

22. ____ Je retarde à résoudre les problèmes jusqu'à ce qu'il soit trop tard pour y faire quoi que ce soit.

23. ____ Lorsque je résout un problème, je pense à plusieurs options différentes.

24. ____ Lorsque je prends des décisions, je suis mon intuition sans penser à ce qui va se passer.

25.___J'agit trop rapidement lorsque je prend des décisions.

Appendix E

The White Bear Suppression Inventory (WBSI)

ISOB

Ce questionnaire porte sur les pensées. Il n'y a pas de bonnes ou mauvaises réponses, veuillez donc S.V.P. répondre honnêtement à chacun des énoncés ci-dessous. Veuillez S.V.P. vous assurez de répondre à chacun des énoncés en encerclant la lettre appropriée située devant chaque énoncé.

A fortement en désaccord	**B** désaccord	**C** neutre ou je ne sais pas	**D** en accord	**E** fortement en accord

A B C D E	1.	Il y a des choses auxquelles je préfère ne pas penser.
A B C D E	2.	Parfois, je me demande pourquoi les pensées que j'ai dans ma tête sont là.
A B C D E	3.	J'ai des pensées que je suis incapable d'arrêter.
A B C D E	4.	Il y a des images qui viennent à mon esprit que je ne peux pas effacer.
A B C D E	5.	Mes pensées reviennent souvent à une seule et même idée.
A B C D E	6.	Je voudrais pouvoir arrêter de penser à certaines choses.
A B C D E	7.	Parfois, mes pensées tournent si vite que je voudrais pouvoir les arrêter.
A B C D E	8.	J'essaie toujours de ne pas penser à mes problèmes.
A B C D E	9.	Il y a des pensées qui reviennent continuellement dans ma tête.
A B C D E	10.	Il y a des choses auxquelles j'essaie de ne pas penser.
A B C D E	11.	Parfois, je voudrais vraiment être capable d'arrêter de penser.
A B C D E	12.	Je fais souvent des choses pour me distraire de mes pensées.
A B C D E	13.	J'ai des pensées que j'essaie d'éviter.
A B C D E	14.	Il y a plusieurs pensées que je ne dis à personne.
A B C D E	15.	Parfois, je me garde occupé(e) seulement pour empêcher les pensées de faire intrusion dans mon esprit

Appendix F

The Why Worry (WW-II)

PSI

Vous retrouvez ci-dessous une série d'énoncés qui peuvent se rapporter aux inquiétudes. En référant aux moments ou vous vous inquiétez, veuillez indiquer jusqu'à quel point les énoncés suivants vous semblent vrais (écrivez le chiffre à l'avant de chacun des énoncés).

1	2	3	4	5
Pas du tout vrai	Un peu vrai	Assez vrai	Très vrai	Tout à fait vrai

1. _____ Si je ne m'inquiétais pas, je serais insouciant(e) et irresponsable.
2. _____ M'inquiéter me permet d'être moins ébranlé(e) lorsque des événements imprévus se produisent.
3. _____ Je m'inquiète dans le but de savoir quoi faire.
4. _____ M'inquiéter à l'avance me permet d'être moins déçu(e) si quelque chose de grave se produit.
5. _____ Le fait de m'inquiéter m'aide à planifier mes actions pour résoudre un problème.
6. _____ Le simple fait de m'inquiéter peut empêcher les malheurs d'arriver.
7. _____ Si je ne m'inquiétais pas, cela ferait de moi une personne négligente.
8. _____ C'est en m'inquiétant que je finis par entreprendre le travail que j'ai à faire.
9. _____ J'ai toujours été une personne inquiète et je le serai toujours.
10. _____ Je m'inquiète parce que je pense que cela peut m'aider à trouver une solution à mon problème.
11. _____ Trop penser à des choses positives peut les empêcher de se produire.
12. _____ Le fait de m'inquiéter confirme que je suis une personne prévoyante.
13. _____ Si un malheur arrive, je me sentirai moins responsable si je m'en suis inquiété auparavant.
14. _____ En m'inquiétant, je peux trouver une meilleure façon de faire.

1	2	3	4	5
Pas du tout vrai	Un peu vrai	Assez vrai	Très vrai	Tout à fait vrai

15. _____ L'inquiétude me stimule et me rend plus efficace.

16. _____ Le fait de m'inquiéter m'incite à passer à l'action.

17. _____ Le simple fait de m'inquiéter diminue le risque que quelque chose de grave arrive.

18. _____ En m'inquiétant, je fais certaines choses que je ne me déciderais pas à faire autrement

19. _____ Le fait de m'inquiéter me motive à faire les choses que je dois faire.

20. _____ Mes inquiétudes à elles seules peuvent diminuer les risques de danger.

21. _____ Si je m'inquiète moins, je diminue mes chances de trouver la meilleure solution.

22. _____ Le fait de m'inquiéter me permettra de me sentir moins coupable si quelque chose de grave se produit.

23. _____ Si je m'inquiète, je serai moins triste lorsqu'un événement négatif se produira.

24. _____ En ne s'inquiétant pas, on peut attirer les malheurs.

25. _____ Le fait de m'inquiéter démontre que je suis une bonne personne.

Appendix G

Consent Form

Formulaire de consentement

Chercheurs:

Nina Laugesen, candidate à la maîtrise en psychologie (848-2229)
Michel Dugas, Ph.D., Université Concordia.

A. But de la recherche

Le but de la recherche est d'approfondir nos connaissances des facteurs associés aux inquiétudes et à l'anxiété.

B. Procédure

Ma participation au projet de recherche consiste à remplir en classe un questionnaire de renseignements généraux (âge, sexe, etc.) et une série de questionnaires portant sur les facteurs associés aux inquiétudes et à l'anxiété.

C. Conditions de participation

Je comprends que je suis libre de participer à cette recherche et que je peux me retirer en tout temps, sans avoir à fournir de raison, ni subir de conséquences négatives. Pour me retirer, je n'ai qu'à ne pas remplir les questionnaires qui me seront remis et à effectuer un travail personnel jusqu'à ce que les autres aient terminé.

Je sais que ma participation aidera à l'approfondissement des connaissances des facteurs associés aux inquiétudes et à l'anxiété chez les adolescents. Ma participation à cette étude ne comporte aucun risque.

J'ai été informé(e) que tous les résultats des questionnaires seront traités de manière tout à fait confidentielle et seront codifiés par numéro dès leur réception. Ainsi mon nom ne pourra en aucun temps être associé aux données contenues dans les questionnaires.

Seuls les membres de l'équipe de recherche auront accès aux questionnaires et aux données. De plus, les questionnaires seront gardés dans un local fermé à clé et réservé à cette fin. Le présent formulaire de consentement sera récupéré et entreposé séparément des questionnaires afin qu'il ne soit pas possible d'établir de lien entre les deux.

J'AI PRIS CONNAISSANCE DES DIFFERENTS ELEMENTS DU PRESENT PROJET DE RECHERCHE. JE SOUSSIGNE(E)_____
ACCEPTE DE PARTICIPER À UNE RECHERCHE PORTANT SUR LES INQUIETUDES DES ADOLESCENTS.

Signature du participant:_____
Signature de l'expérimentateur:_____
Date:_____

Merci à l'avance de votre collaboration.

Appendix H

General Information sheet

Information Générale

1) Age: _____

2) Sexe: M _____ F _____

3) Année scolaire: secondaire 3: _____
secondaire 4: _____
autres (spécifiez): _____

4) Domaine d'études: _____

5) Type de famille: famille traditionnelle: _____
famille monoparentale: _____
famille reconstituée: _____

6) Quelle(s) langue(s) parles-tu à la maison:
français: _____
anglais: _____
autres (spécifiez): _____

7) A quel(s) groupe(s) culturel(s) t'identifies-tu (e. g. Canadien, Haïtien, Chinois, Italien, etc.)? _____