Gender Differences in Worry and Associated Cognitive-Behavioural Variables

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Abstract

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Research has shown that there is a significant gender difference in the worry report of women and men, with women consistently reporting more worry than men (Stavosky & Borkovec, 1988). This study investigated this phenomenon by looking at gender differences in cognitive variables associated with excessive worry. Intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance have been linked with the generation and maintenance of worry (Dugas et al., 1998). Two-hundred and twenty-one female and 103 male university students completed six questionnaires assessing trait worry, intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance. The results showed that women reported significantly more worry than men on two trait worry scales, as well as significantly more worries about lack of confidence issues. In relation to cognitive variables associated with worry, women also reported engaging in significantly more thought suppression and negative problem orientation than men. A non-significant trend emerged for a closer relationship between positive beliefs about worry and trait worry for men. It is postulated that thought suppression and negative problem orientation may account for women's increased reporting of worry, and that positive beliefs about worry may have a closer relationship to worry in men. Hypotheses accounting for the observed gender effects in the cognitive variables used in this study are discussed.

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The act of worrying is a common psychological phenomenon that is experienced by all individuals to varying degrees. Among individuals in non-clinical populations, worry has been found to cause some impairment of day to day functioning in the workplace, the home, and in social domains (Tallis, Davey, & Capuzzo, 1994). Furthermore, pathological worry is the primary symptom of Generalized Anxiety Disorder (GAD), and is used as a marker of distinction between GAD and other anxiety disorders (DSM-IV, American Psychiatric Association, 1994). Because of its presence in both daily life and psychopathology, research directed toward a fuller understanding of the construct of worry can therefore be deemed an important field of inquiry.

Over the years, researchers have attempted to properly define worry, as well as delineate any associated variables. One of the first working definitions of worry was devised in 1983 by Borkovec, Robinson, Pruzinsky, and Depree. The authors contended that "worry is a chain of thoughts and images, negatively affect-laden and relatively uncontrollable. The worry process represents an attempt to engage in mental problem-solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes" (p.10). MacLeod, Williams, and Bekerian (1991) later defined worry by amalgamating this definition with one from other research (i.e., Barlow, 1988). They stated that "worry is a cognitive phenomenon, it is concerned with future events where there is uncertainty about the outcome, the future being thought about is a negative one, and this is accompanied by feelings of anxiety" (p. 478). Worry, however, appears to be a difficult construct to define in its entirety. It is related to thought, imagery, memory,

affect, central and peripheral physiology, and behaviour (Borkovec, Ray, & Stöber, in press). Worry has been particularly closely linked to anxiety, at times being called "the cognitive component of anxiety" (Mathews, 1990), although worry and anxiety have now been found to be independent, albeit highly related, constructs (Davey, Hampton, Farrell, & Davidson, 1992). As revealed by Davey and colleagues, certain paradoxical features arise in the study of worry, in that it has been linked to both measures of poor psychological functioning, as well as constructive psychological factors. As suggested by the researchers, a functional or dynamic model that takes other variables into account may elucidate a clearer picture of the worry process.

Worry and Beliefs About Worry

It has been assumed that individuals who worry consider their worrying to be a negative experience (Mathews, 1990). However, although worry is often an involuntary thought process in response to problems encountered in daily life, it can also be a voluntary act. That is, individuals might at times choose to worry, perhaps deeming their worries to have a positive function. In fact, Freeston and colleagues (1994) posited that individuals who worry might believe that it serves some purpose. Consequently, the researchers devised a scale to establish the reasons why people might worry. Two main beliefs about worry emerged, namely that worrying can prevent negative outcomes from occurring, and that worrying is a positive action toward finding a solution. Furthermore, a greater number of positive beliefs about worry were endorsed by participants as the reported levels of worry increased.

The finding that high worriers tend to have positive beliefs about the functions of worry has been noted elsewhere. A recent study of the beliefs of worried individuals

found that positive beliefs about worry were positively correlated with high trait worry scores (Stöber, 2000). Although negative beliefs about worry (e.g., " worrying blows problems out of proportion" and "worrying stops me from performing at an optimal level") were also found to be associated with level of worry, Stöber discovered that only positive beliefs showed specificity in their relationship to trait worry. Furthermore, Tallis and colleagues (1994) discovered that participants in their study described worry as a motivational influence and that it could aid in problem solving and analytic thinking. In a later report on the same study, Davey, Tallis, and Capuzzo (1996) noted that individuals who endorsed positive beliefs about worry also scored high on measures of poor psychological functioning . Specifically, participants who strongly endorsed positive consequences to worrying also had high scores on scales of anxiety, depression, trait worry, and negative cognitions (i.e., "automatic thoughts"). It was concluded that "while many of these perceived functions can be seen as representing constructive approaches to resolving life problems, many others appear to serve more tangential purposes and make the worry process resistant to change" (p. 518). Consequently, positive beliefs such as "worrying can stop bad things from happening" may be negatively reinforced by the non-occurrence of an aversive event, thereby strengthening these beliefs.

Worry and Problem Orientation

According to Tallis and colleagues (1994), the worries of non-clinical individuals tend to be self-relevant, centered primarily around work competence, health issues, finances, and intimate relationships. Forty-six percent (46%) of their respondents claimed that worrying served as a type of aid to solving their problems, in that thinking about

their worries might better lead to a solution. Therefore, much research has been directed toward the investigation of a possible relationship between worry and problem solving.

As stated previously, many individuals assume that the act of worrying can assist in generating solutions. However, in a review by Borkovec (1985), the author noted that while worriers are highly proficient at identifying all the possible negative outcomes in a chosen course of action, they remain inept at actually generating solutions or effective coping responses to their problems. He conjectured that worrying might be better seen as an attempt on the part of an individual to solve problems, rather than a substantive problem-solving act.

It is noteworthy that the research on problem-solving skills and its relationship to worry does not distinguish between problems that are potentially soluble and those that may not be. Everyday worries, may in fact, have a realistic solution (e.g., worries about an exam can be solved by studying). However, as noted by Davey and colleagues (1992), problems that may objectively appear soluble, as in the above noted example, may in actuality be perceived as uncontrollable by certain individuals, particularly if they have a high external locus of control. That is, if individuals believe situations to be outside their control, they may perceive a problem as insoluble even if a solution is readily available. Furthermore, the authors note that a problem with a practical solution may lead to a chain of consequences, some of which are uncontrollable, thereby creating insoluble problems. It is therefore difficult to control for the solubility of a problem in relation to research on problem solving and worry.

In 1971, D'Zurilla and Goldfried defined problem solving as being comprised of five distinct components: 1) problem orientation; 2) problem definition and goal

formulation; 3) generation of alternative solutions; 4) decision making; and 5) solution implementation and verification. In a series of studies investigating the relationship of problem solving, worry, and anxiety (Davey et al., 1992), it was discovered that pathological worrying has a strong correlation with poor problem-solving confidence and poor perceived control over the problem-solving process, two components that comprise the construct of problem orientation. Problem orientation refers to an individual's cognitive, behavioural, and affective set when faced with a problem, and is distinct from the actual skills involved in solving problems. A question that may be raised by Davey and colleagues' findings, however, pertains to whether the distinction between high and low worriers lies in deficits in actual problem-solving skills per se, or uniquely in subjective problem orientation. Davey (1994) attempted to address this issue by administering a social problem-solving task, along with measures of worry, to university students. No correlation was found between level of worry and problem-solving ability. However, worry scores were found to be highly correlated with poor problem-solving confidence and poor perceived control, which, as stated previously, are both components of problem orientation. Davey's results seem to suggest that increases in worry are not due to poor problem-solving abilities per se, but rather an individual's lack of belief in their ability to solve problems and to implement solutions. Unfortunately, the picture painted by Davey's research does not fully explain the relationship between problem solving and worry, as he was unable to show whether there exists an association between increases in worry and potential decreases in problem-solving effectiveness.

In order to better clarify the link between the variables of worry and problem solving, Dugas, Freeston, and Ladouceur (1995) presented university students with two

measures of worry, the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) and the Worry Domains Questionnaire (WDQ; Tallis, Eysenck, & Mathews, 1992), and two self-report measures of problem solving. The first measure of problem solving, the Social Problem-Solving Inventory (SPSI; D'Zurilla & Nezu, 1990) is subdivided into two major scales, Problem Orientation and Problem-Solving Skills. The second measure, the Problem-Solving Inventory (PSI; Heppner & Petersen, 1982), measures three separate constructs: Problem-Solving Confidence, Approach-Avoidance Style, and Personal Control. In a hierarchical regression, the researchers found that significant variance (38% and 48% for the PSWQ and the WDQ respectively) was accounted for by both the PSI's Personal Control and Problem-Solving Confidence scales and the SPSI's Problem Orientation scale. No significant contribution was made by the Approach-Avoidance Style scale of the PSI or the Problem-Solving Skills scale of the SPSI. The authors concluded that the difficulties worriers experience in relation to problem solving may be due primarily to deficits in problem orientation, and not in problem-solving skills.

These findings were replicated in similar research conducted by Dugas, Freeston, and Ladouceur (1997) on the trait-like tendency to worry in a non-clinical sample. In order to determine whether problem orientation uniquely predicted worry scores, a hierarchical regression was conducted. Age, gender, and mood state (anxiety and depression) were entered in the first and second stages. Both "subject" demographics and mood were found to predict worry. Problem-solving skills, measured by the Problem-Solving Skills scale of the Social Problem-Solving Inventory- Abridged (SPSI-A), were entered in the third stage of the regression, but did not make a significant contribution.

When problem orientation was entered in the fourth stage, it was found to uniquely account for 15.3% of the variance in worry scores. The results of this study corroborate previous findings of a relationship between worry and problem orientation, as well as the independence of worry in relation to problem-solving skills.

Recently, Maydeu-Olivares and D'Zurilla (1996) revised their model of problem-solving, asserting that problem orientation encompasses two specific components, namely positive problem orientation and negative problem orientation. Positive problem orientation is defined as a constructive cognitive set that includes appraising a problem as a challenge, believing in one's ability to solve a problem, a willingness to devote time and effort in order to solve a problem, and the expectation of a positive outcome. Negative problem orientation, on the other hand, is considered a dysfunctional cognitive set that constitutes seeing a problem as a threat, showing a lack of confidence and perceived control in problem-solving, a tendency toward becoming upset and frustrated when attempting to problem-solve, and a pessimistic view of the outcome. These two constructs are not opposite extremes on a continuum, but rather are considered distinct, albeit related, constructs (D'Zurilla, Nezu, Maydeu-Olivares, 1998). However, it appears that solely the construct of negative problem orientation, the dysfunctional cognitive-emotional aspect of problem-solving, is related to worry. In a study by Gosselin, Dugas, and Ladouceur (2000), it was found that high worriers reported significantly more negative problem orientation than moderate worriers. Moreover, no differences were found in relation to positive problem orientation between the moderate and high worriers. The authors contended that it is uniquely the negative problem orientation component of problem orientation that is related to worry, and not positive problem orientation.

Worry and Cognitive Avoidance

Despite the fact that chronic worriers might deem their worry to have positive elements, it has been shown that they hold negative cognitions about their worries as well (Tallis, et al., 1994). In addition, the content of their worry might prove extremely disturbing (e.g., thinking about one's children dying), which in turn would lead to attempts to suppress these thoughts. This act of suppression, however, is not effective. Wegner and Zanakos (1994) reported that the attempt to block a thought resulted paradoxically in a preoccupation with the thought. They hypothesized that this was due to two mental processes functioning in tandem: an intentional operating process and an effortless monitoring process. The operating system seeks out desired states, whereas the monitoring system searches for content that signals a failure to achieve the desired state. In relation to the attempted suppression of a thought, the operating process would consciously search for "anything but" thoughts, whereas the monitoring process would scan for occurrences of the unwanted thought, in order to prompt the reinitiation of the operating system. In other words, the more an individual attempts to block a thought, the more likely an increase in the frequency of the thought will occur.

The increase in unwanted thoughts following suppression has been extensively investigated. In several studies, individuals instructed to suppress a thought (e.g., "think of anything but a white bear") reported more occurrences of the thought when they stopped suppressing than those who were not instructed to suppress (Clark, Ball, & Pape, 1991; Wegner, Schneider, Carter, & White, 1987). This phenomenon of experiencing an increased resurgence of a thought after cessation of suppression has been called the "rebound effect." Other studies have found an increase in the unwanted thought during

the actual suppression attempt (Merckelbach, Muris, van den Hout, & de Jong, 1991; Lavy & van den Hout, 1990), a phenomenon labeled the "enhancement effect." The finding of rebound and/or enhancement effects have been shown with personally relevant, naturally occurring, negative thoughts as well (Salkovsis & Campbell, 1994; Trinder & Salkovsis, 1994). It should be noted that there has been controversy in relation to the effects of thought suppression, however, with some researchers finding neither an enhancement nor a rebound of thoughts (Muris, Merckelbach, & Horselenberg, 1992; Rutledge, Hollenberg, & Hancock, 1993). It has been postulated that the lack of consistency in the findings on thought suppression may be due to methodological differences in the various experiments (Trinder & Salkovskis, 1994).

Research on thought suppression has found a similar process in relation to worry. Roemer and Borkovec (1993) hypothesized that worriers may in fact distract themselves from their worries with thoughts of other worrisome topics, which in turn lead to a rebound of the primary worries, thereby maintaining a cycle of worry. In a study by Becker, Rinck, Roth, and Margraf (1998), individuals with excessive worry were instructed to suppress their main worry. An enhancement effect occurred, whereby participants were unable to stop thinking of their main worry during attempted suppression.

Cognitive avoidance in relation to worry, however, may be conceptualized in two ways. First, as stated previously, individuals who worry may attempt to suppress their thoughts, which results in a paradoxical increase in these thoughts. Second, individuals who worry may do so in the form of an internal monologue rather than visual images, in order to avoid the heightened anxiety associated with visually picturing negative events.

This latter form of cognitive avoidance in relation to worry has also been extensively investigated. Research on the nature of worry has found it to be comprised primarily of verbal-linguistic content rather than images (Borkovec & Inz, 1990; Borkovec & Lyonfields, 1993). As such, worry tends to be an internal monologue, in essence talking to one's self, rather than visualizing pictures or images in one's mind. This focus on thoughts over images has a considerable effect on an individual's somatic responses, as mentally picturing a feared event will elicit a strong cardiovascular response, whereas the cardiovascular response produced by verbally thinking of the same event will be significantly weaker (Vrana, Cuthbert, & Lang, 1986). The inhibition of physiological arousal through a focus on verbal thoughts has important implications for the maintenance of worry.

In order to reduce anxiety toward a feared event in the long-term, Foa and Kozak (1986) contend that emotional processing of the feared event must occur. The emotional processing of feared material is evidenced by initial heightened physiological activation upon presentation of the feared material, thereby providing a fear cue. However, when an individual cognitively avoids a fear cue, the threatening meaning of the feared material cannot be accessed. If the meaning of the fear is not subject to availability, there is little possibility of modification through the presentation of corrective information. As such, the cognitive avoidance of a fear structure reduces the likelihood of altering that fear structure. Since heightened anxiety is necessary to ultimately modify a fear structure, the reduced physiological arousal associated with worrying in the form of an internal monologue will hinder emotional processing, thereby maintaining the worry process.

The effect of the verbal-linguistic content of worry on somatic activation was investigated by Borkovec and Hu (1990). Speech phobic participants in their study were told either to engage in worrisome or relaxed thinking prior to visualizing a public speech image. Cardiovascular responses were monitored throughout. It was found that participants who engaged in worrisome thinking showed significantly less heart rate activity than those who engaged in relaxed thinking prior to visualization. Inasmuch as somatic activation is necessary for emotional processing, the authors concluded that the verbal-linguistic content of worry inhibits the processing of phobic material, and hence maintains the fear structure. However, this lack of physiological arousal occurs without affecting the subjective report of fear by the worrying individual. Borkovec and Hu postulated that these effects might be due to a weak connection between thought activity and the emotional system, wherein thinking about a negative event does not activate the complete fear structure necessary for emotional processing.

A study conducted by Freeston, Dugas, and Ladouceur (1996) tested the hypothesis that increased worry was related to predominantly verbal linguistic thought. It was found that worries are mainly verbal-linguistic, and that excessive worriers report a higher percentage of verbal thoughts than moderate worriers. Furthermore, it was shown that among excessive worriers there was an association between a greater percentage of verbal thoughts and a reduction in autonomic hyperactivity, thereby corroborating the earlier finding that the decrease in somatic activation brought about by an internal monologue may serve as a negative reinforcement in the maintenance of worry.

Worry and Intolerance of Uncertainty

The evidence from previous research therefore indicates a relationship between worry and the variables of positive beliefs about worry, negative problem orientation, and cognitive avoidance. As stated beforehand, Borkovec (1985) noted that worriers are highly adept at defining problems, but slower at finding solutions. Tallis, Eysenck, and Mathews (1991) postulated, however, that worriers might be delayed in the decision-making process of problem solving. They contended that worriers showed "elevated evidence requirements" prior to making a decision. That is, it was theorized that worried individuals necessitated a great deal of information before making a decision about what actions to take in order to solve their problems. Subsequent to this, the authors contended that "the longer it takes an individual to resolve a problem the more they are likely to worry about it" (p. 22). Based on the findings of previous studies (Metzger, Miller, Cohen, Sofka, & Borkovec, 1990; Tallis, 1989), Tallis, Eynsenck, and Mathews (1991) investigated whether elevated evidence requirements were in fact related to worry. Participants in their study were required to watch letters on a screen and respond as to whether the letter "E" was present or absent in the cluster. It was found that high and low worriers showed similar response times when the stimulus was present. When the stimulus was absent, however, high worriers did in fact show a significantly greater response latency compared to low worriers. The researchers rejected cautious response style as a plausible alternate explanation of their results, as no significant difference in error rates was found between the two worry groups. Tallis and colleagues subsequently asserted that elevated evidence requirements appeared to be the most logical explanation for their findings.

An independent research group uncovered a similar but distinct construct to elevated evidence requirements. The phenomenon has been labeled "intolerance of uncertainty," and this construct has been linked to worry (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). Intolerance of uncertainty has been 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). Intolerance of uncertainty involves seeing uncertain events as threatening, seeing uncertainty as reflecting poorly on an individual, as well as leading to frustration, stress, and the inability to take action. It therefore differs from the construct of elevated evidence requirements, which can be construed as a behavioural response to intolerance of uncertainty. In other words, requiring more cues prior to making a decision (i.e., the need for elevated evidence requirements) is a way of making the uncertain certain, and does not encompass the emotional and cognitive aspects that comprise intolerance of uncertainty.

The tendency toward being intolerant of uncertainty has been observed among individuals with excessive worry, as well as those with GAD (Dugas, Ladouceur, Boisvert, & Freeston, 1996). Both intolerance of uncertainty and negative problem orientation show a significant relationship to worry. However, as problem orientation relates to lack of confidence in one's problem-solving abilities, there may be substantial overlap between the two constructs of intolerance of uncertainty and problem orientation. The relationship of these variables to each other therefore needs to addressed. Namely, does either variable encompass the other in its relationship to worry? Dugas, Freeston, and Ladouceur (1997) undertook the investigation of this question. Non-clinical

participants were administered a variety of questionnaires, including the Penn State Worry Questionnaire (PSWQ), the Intolerance of Uncertainty Scale (IUS; Freeston, Rhéaume, et al., 1994), and a self-report problem-solving inventory, the SPSI-A (Dugas, Freeston, & Ladouceur, 1994). Trait worry was found to be significantly correlated with both scores on the IUS and the Problem Orientation scale of the SPSI-A. No relationship was found between worry and the Problem-Solving Skills scale. In two subsequent hierarchical regressions, IUS and Problem Orientation scores were entered, with the order of entry being varied so as to determine which variables contributed joint or unique variance with respect to worry scores. It was found that regardless of order of entry, both variables independently predicted worry scores. As such, it was concluded that problem orientation and intolerance of uncertainty make common and unique contributions to worry.

Ensuing research into intolerance of uncertainty and its association to worry sought to investigate the specificity of the relationship between both variables. Dugas, Gosselin, and Ladouceur (in press) assessed non-clinical participants through questionnaires on worry, obsessions, panic sensations, and intolerance of uncertainty, in order to determine whether intolerance of uncertainty was specific to worry, and not to processes related to panic sensations or obsessions. In a hierarchical regression, IUS scores were entered as the predicted variable. Demographic variables and scores on obsessions and panic sensations were entered prior to worry scores. Demographic variables made no significant contribution, and panic sensation and obsession scores accounted for 22.1% of the variance in intolerance of uncertainty scores. When worry scores were entered in the following step of the regression, they were found to uniquely

account for 33.9% of the variance in intolerance of uncertainty scores. The authors inferred from these findings that intolerance of uncertainty was strongly and specifically related to worry.

Further investigation into the specificity of the relation of intolerance of uncertainty to worry was also conducted with regards to social anxiety and depression (Schwartz, Dugas, & Francis, 2000). As with the aforementioned research on panic sensations and obsessions, intolerance of uncertainty was found to be more highly related to worry than social anxiety and depression. Furthermore, worry was also found to be more highly related to intolerance of uncertainty than to process variables related to social anxiety and depression (i.e., safety behaviours and dysfunctional attitudes, respectively).

Recently, Lachance, Ladouceur, and Dugas (1999) investigated the strength of the relation between intolerance of uncertainty and worry. Through the use of a hierarchical regression, the authors evaluated the contribution of intolerance of uncertainty after partialling out positive beliefs about worry, negative problem orientation, and cognitive avoidance. It was discovered that intolerance of uncertainty uniquely accounted for 10% of the variance in worry scores, rendering it the variable that makes the strongest contribution to worry scores. Thus, it can be stated that although positive beliefs about worry, negative problem orientation, and cognitive avoidance contribute to high worry, it appears that intolerance of uncertainty may be the primary contributing variable.

Model of Excessive Worry

A number of cognitive variables have consequently been shown to have an important and distinct relationship to trait worry. The question remains, however, as to

how these constructs of intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance, precisely contribute to, or exacerbate, worry. Furthermore, for each variable, it is necessary to understand how important a contribution is made.

Recently, Dugas, Gagnon, Ladouceur, and Freeston (1998) proposed a tentative cognitive model of excessive worry that incorporated all four aforementioned components. The model accords a central role to intolerance of uncertainty in the generation of excessive worry. Intolerance of uncertainty is assumed to "exacerbate the initial 'what if...?' questions and even generate these questions in the absence of an immediate stimulus" (p. 216). Worry is also described as being maintained by positive beliefs about worry, such as the thought "worrying can prevent bad things from happening," where the non-occurrence of a feared event (i.e., bad things happening) may negatively reinforce these beliefs about the positive value of worrying. The third feature of the model devised by Dugas and colleagues is negative problem orientation, which as stated previously, has been shown to be highly related to trait worry. The final component of the model is cognitive avoidance. The attempted suppression of worrisome thoughts and the resultant increase in these thoughts, as well as the cognitive avoidance of fearful imagery, and the decrease in attendant somatic activation, are postulated to be important processes in the maintenance of excessive worry.

Although each variable, in isolation, has been found to be related to trait worry, Dugas et al.'s study was an attempt to amalgamate all four process variables into one study. The purpose of the investigation was to establish the relative importance of each of the main components of the model, and to ensure that none of the variables were

redundant, but rather were each making an independent contribution to worry. Participants were normal controls and GAD patients, and a discriminant function analysis was conducted in order to determine the relative contribution of each variable (intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance). The discriminant function analysis was also conducted to examine the prediction value of the elements of the model in classifying the two groups of participants. Following the discriminant analysis, 82% of the participants were correctly classified as either GAD patients or normal controls. It was further discovered that all four process variables were highly related to the discriminant function, although intolerance of uncertainty made the greatest contribution, being the pivotal variable in relation to the function.

Although the variables of negative problem orientation, positive beliefs about worry, and cognitive avoidance all contribute to, or maintain, excessive worry, it is intolerance of uncertainty that is considered to be the underlying variable within the model. Intolerance of uncertainty is a higher order construct that is, as noted previously, specific to worry, and is considered to contribute both to increases in worry, but also to the other variables within the model. For example, an individual who is intolerant of uncertainty may develop the belief that worrying helps them solve their problems because they have difficulty dealing with the uncertainty inherent in the problem-solving process. Moreover, a person who is intolerant of uncertainty may focus on these uncertain aspects of problem-solving, thereby interpreting problems as threats, that is, developing a negative problem orientation. Finally, as intolerance of uncertainty encompasses the belief that it is unacceptable that a negative event occur, an individual intolerant of

uncertainty may consciously attempt not to think about potentially negative outcomes or uncertain events, thereby contributing to thought suppression (Dugas, Buhr, & Ladouceur, in press).

Gender and Worry

The studies discussed above have allowed for a clearer elucidation of the construct of worry. It should nevertheless be reiterated that worry is a highly complex cognitive phenomenon that is often accompanied by emotional, somatic, and behavioural components, and much research remains to be performed in order to better understand the processes involved. One neglected area of research is the relationship between gender and worry. The great majority of studies on worry categorize the samples of subjects as chronic, excessive worriers, or normal worriers. The gender of participants is either disregarded, noted solely for a demographic description of the subject pool, or partialled out of statistical analyses.

The practice of essentially disregarding the effect of gender on worry is maintained despite the common knowledge that there are differences in worrying between women and men (Al-Issa, 1982). Notably, a disproportionately larger number of women report worrying than men. Stavosky and Borkovec (1988) noted that in their previous studies, women were more likely to report being "worriers" than men. Moreover, the authors noted that 80 to 88% of high worriers within a research sample may be comprised of women, with men being less likely to report high worry. The finding of women "worrying more" is far from recent. In the debate on possible gender differences in mental disorders, one fact has consistently emerged: Women report experiencing anxiety and worry to a greater extent and frequency than men (Dohrenwend

& Dohrenwend, 1976; Gove, 1980; Gove & Tudor, 1973). This finding has remained constant in recent research as well, with the gender of participants arising as a significant predictor of trait worry scores (e.g., Dugas, Freeston, & Ladouceur, 1997).

The bulk of research on gender and its relationship to worry has centered on the causes for the discrepancy in worry report between women and men. A number of studies attempted to determine if external factors influenced the preponderance of women engaged in worry, with theories denouncing a potential response bias (Phillips & Segal, 1969), or the influence of clinician or patient behaviour (Broverman, Broverman, Clarkson, Rosenkrantz, & Vogel, 1970). A review by Gove (1980) investigated these potential biases and did not find evidence to support them. The contention has been, and remains today, that women do appear to worry more, and this finding cannot be dismissed as due exclusively to any external bias.

If it is accepted that women worry more, therefore a subsequent question that can be posed is: Why? Numerous hypotheses have abounded to explain this phenomenon. It has been postulated that modern society ascribes feminine and masculine gender-roles to women and men respectively, and that "worry has been traditionally identified as a feminine, gender-role stereotypic trait by both males and females" (Stavosky & Borkovec, 1988; p. 87). In fact, a recent study on perceptions related to worry, found that both women and men perceive women as engaging in more worry than men (Wood, Conway, & Dugas, 2000). Alternate conjectures include the notion that the roles women play in society, specifically lower-status positions in the workplace and in the home, contribute to greater stress and worry in women (Gove, 1980), and that women may be more prone to internalizing their problems, hence worrying, whereas men, by contrast,

may externalize to a greater extent (i.e., substance abuse and antisocial behaviour) (Dohrenwend & Dohrenwend, 1976). It should be noted that these theories have not been dismissed as invalid, although few have undergone rigorous empirical testing.

In general, there has been a paucity of research that has directly examined the relationship between gender and worry, and even less on gender and variables related to worry (e.g., intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance). The studies that have been conducted have been unable to fully account for the gender differences that consistently emerge. A 1998 study attempted to explain the gender discrepancy in anxiety symptoms through the use of psychosocial variables such as stress level, self-esteem, social competence, social support, and coping skills (Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998). Although anxiety is a distinct and separate construct from worry (Davey et al., 1992), worry scores have been found to be highly associated with both trait (Borkovec et al., 1983) and state anxiety (Meyer et al., 1990). The rationale behind this methodology was based on previous findings where a correlation was demonstrated between the psychosocial variables and depressive symptoms (Lewinsohn, Roberts, Seeley, Rohde, Gotlib, & Hops, 1994). It was found that although the measures used were significantly related to the anxiety level of female participants, gender differences remained after controlling for the psychosocial variables.

A similar type of result emerged in a study investigating the relationship between the tendency to worry and gender-role orientation. McCann, Stewin, and Short (1991) administered questionnaires assessing trait worry, social desirability, and scales devised to determine masculinity and femininity levels. Beyond the finding that a greater number

of female participants reported higher levels of worry than men, it was found that trait worry scores were negatively correlated with both social desirability scores and masculinity. However, the results also showed that after statistically controlling for the variance predicted by both social desirability and masculinity, gender remained a significant predictor of worry.

No theory has been able to fully account for the greater preponderance of women engaging in worry as compared to men. However, as there is great variability in the thoughts and behaviours present within both genders, it is unlikely that any one theory could devise a comprehensive explanation for women's higher reported worry. Rather, there may be cognitive, behavioural, emotional, interpersonal, developmental, and possibly biological factors that combine to account for the gender difference. What can be stated with assurance, however, is that although women do report greater and more frequent worry, men do report worry as well. It may be that within the worries of women and men, differences in worry content or themes can be found. Insight into potentially different worry content depending on the gender of an individual, may ultimately benefit the search for a causal explanation for the gender discrepancy in worry.

In light of the findings of previously stated research, wherein trait worry was found to be significantly predicted by the variables of intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance, a closer look at the possible gender differences for these variables may prove elucidating. It can be conjectured that differential reporting on measures related to worry according to gender may lead to a greater understanding of the potential quantitative differences in the worries of women and men.

A promising study was conducted by D'Zurilla, Maydeu-Olivares, and Kant (1998), examining age and gender differences on the Social Problem-Solving Inventory-Revised (SPSI-R). The SPSI-R is comprised of five subscales: Positive Problem Orientation (PPO), Negative Problem Orientation (NPO), Rational Problem Solving (RPS), Impulsivity/ Carelessness Style (ICS), and Avoidance Style (AS). The researchers found significant gender differences on only two subscales, notably the PPO and the NPO scales. Men scored higher on the Positive Problem Orientation scale, a concept that, as stated previously, encompasses the tendency to see a problem as a challenge, problem-solving confidence, and the expectation of a positive outcome. Women scored higher on the Negative Problem Orientation scale, which measures a dysfunctional cognitive set that includes the perception of a problem as a threat and a lack of problem-solving confidence. However, the gender difference in negative problem orientation was greater than the gender difference found in positive problem orientation, with women scoring much higher than men on the NPO scale, when compared to men's higher scores on the PPO scale.

The findings of D'Zurilla and colleagues (1998) highlight the importance of investigating the quantitative gender differences that may emerge within a complex construct such as problem solving. That is, problem solving is a multidimensional construct comprised of five distinct steps (D'Zurilla & Goldfried, 1971). Differential gender reporting was not found to be uniform among all the components of problem solving, however, and such lack of uniformity in relation to gender differences may emerge among other variables as well.

With the knowledge that: 1) it has consistently been found that women are more likely to report engaging in worry than men; 2) trait worry scores are significantly predicted by intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance; and 3) within at least one variable strongly related to worry, notably a measure of problem solving, certain subscales show gender differences, an important question can be posed. Namely, will specific gender differences emerge in one, a few, or all of the four variables tentatively outlined in the model of trait worry devised by Dugas and colleagues (1998)? This question can be further expanded by conjecturing that perhaps a differential interplay among the variables and worry may emerge. For example, cognitive avoidance might play a more pivotal role in the worry of men than women, or perhaps women hold more positive beliefs about their worries than men do.

The present research attempted to address these issues. Women and men were assessed on trait worry and the process variables in the model outlined by Dugas and colleagues (1998), in an attempt to identify any specific gender differences. A measure of worry themes was also administered in order to determine whether women and men worry about different content issues as well.

Five hypotheses were formulated for this study. First, in accordance with previous research, it was postulated that trait worry scores would be higher among women than men. The second postulate of this research pertained to worry themes. It was expected that women and men would vary in the type of worries they reported. For example, women may report greater worries about relationships than men, whereas men may report more financial worries than women. However, no specific hypothesis was generated as to

what exact differences would emerge according to gender. Third, it was expected that the finding of a high correlation between the process variables of intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance to measures of trait worry would be replicated in this research. The fourth hypothesis related to differences in the process variables according to gender. It was expected that women would score higher on some of the cognitive process measures than men. Inversely, however, men may score higher on some process measures than women. For example, women may report more positive beliefs about worry than men, and men may report more cognitive avoidance than women. As with the second hypothesis, no specific predictions were made. Finally, it was expected that some of the cognitive process variables, would either have a closer relationship to worry in women than in men, or a closer relationship to worry in men than in women. In other words, one, both , or all the cognitive process variables would be a more sensitive predictor of worry in either men or women.

Method

Participants

Participants were 221 females ranging in age from 18 to 41 ($M = 22.4$, $SD = 4.3$), and 103 males who ranged between 19 to 57 years of age ($M = 23.6$, $SD = 5.0$), and were recruited from undergraduate courses at Concordia University. The majority of volunteers were completing a degree in Psychology, although other fields were represented in the participant pool (i.e., Geography, Biology, etc.). Demographic characteristics concerning participants' field and year of study, status at the university (i.e., full-time or part-time status) are presented in Table 1.

Table 1

Demographic Characteristics of Female and Male Participants

Demographic Characteristic	Women n = 221		Men n = 103	
	Mean	SD	Mean	SD
Age	22.4	4.3	23.6	5.0
	%		%	
University Status				
Full-time	86.9		92.2	
Part-time	13.1		5.8	
Field of Study				
Fine Arts	.9		1.9	
Commerce	.9		1.0	
Communications	3.6		5.8	
Humanities	1.4		4.9	
Pure/Applied Sciences	41.6		51.5	
Social Sciences	50.2		34.0	
Year of study				
1st year	52.5		25.2	
2nd year	24.9		25.2	
3rd year	12.2		32.0	
4th year	3.2		8.7	
graduate studies	0.0		1.0	
other	7.2		6.8	

Note: Fine Arts = music, theatre, dance, film/cinema, art history, fine arts; Commerce = finance, accounting, management/administration, marketing; Communications = languages/linguistics, communication studies, English, French; Humanities = history, philosophy, anthropology, religion, English literature, child/ women's studies, classics; Pure/Applied Sciences = biology, chemistry, math, geography, engineering, exercise science; Social Sciences = sociology, APSS, economics, psychology, human/environment relations, political science.

Measures

Six questionnaires were used in this research, taken from a larger study. The tendency to worry was assessed by scores on two questionnaires, the Penn State Worry Questionnaire and the total score of the Worry Domains Questionnaire.

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) (see Appendix B). The PSWQ is comprised of 16 items that measure the trait-like tendency to worry on a 5-point Likert scale (where 1 = "Not at all typical" and 5 = "Very typical"). The questionnaire is unifactorial, has high internal consistency with Cronbach alphas ranging from .86 to .94 (Brown, Antony, & Barlow, 1992; Davey, 1993; Stober, 1998), high test-retest reliability of .92 at 8 to 10 weeks (Meyer et al., 1990), as well as adequate convergent and discriminant validity (Meyer et al., 1990).

Worry Domains Questionnaire (WDQ; Tallis, Eysenck, & Mathews, 1992) (see Appendix C). The WDQ is a 25 item questionnaire measuring both the tendency to worry and worry themes on a 5-point scale where 0 = "Not at all" and 4 = "Extremely". The items are divided into 5 subscales: Relationships, Lack of Confidence, Aimless Future, Work Incompetence, and Financial. The total score of the WDQ is a general indicator of worry frequency, and can distinguish between low and high worriers from a non-clinical population (Tallis, Davey, & Bond, 1994). The questionnaire has excellent internal consistency, ranging from $\alpha = .91$ to .92 (Davey, 1993; Stöber, 1998), high test-retest reliability ($r = .85$) (Stöber, 1998), and adequate convergent validity (Davey, 1993). Further, the subscales of the WDQ show adequate internal consistency and test-retest reliability as well (Stöber, 1998).

Intolerance of Uncertainty Scale (IUS; Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994; translation: Buhr & Dugas, 2000) (see Appendix D). The IUS consists of 27 items relating to the idea that uncertainty is unacceptable, reflects badly on a person, and leads to frustration, stress, and inability to take action. The items are measured on a 5-point scale where 1 = "Not at all characteristic of me" and 5 = "Entirely characteristic of me". The original French version of the questionnaire shows excellent internal consistency (α = .91) (Freeston et al., 1994), adequate test-retest reliability (r = .78) at 5 weeks (Dugas, Freeston, & Ladouceur, 1997), and criterion-related, convergent, and discriminant validity (Freeston et al., 1994). Similar results were found for the English version of the IUS. The questionnaire shows excellent internal consistency (α = .95) and adequate test-retest reliability (r = .74) at 5 weeks (Buhr & Dugas, 2000).

Social Problem-Solving Inventory-Revised Short Form (SPSI-R-SF; D'Zurilla, Nezu, & Maydeu-Olivares, 1998) (see Appendix E). The SPSI-R-SF is comprised of 25 items that measure social problem-solving ability on a 5-point Likert scale (0 = "Not at all true of me" and 4 = "Extremely true of me"). The items are divided into 5 subscales: Positive Problem Orientation, Negative Problem Orientation, Rational Problem Solving, Impulsivity/Carelessness Style, and Avoidance Style. The questionnaire has adequate internal consistency (α = .79 to .83) and test-retest reliability (r = .74) at 3 weeks (D'Zurilla, Nezu, & Maydeu-Olivares, 1998). Only the NPO scale of the SPSI-R-SF was used in the analyses of this research. The rationale behind this decision was three-fold. First, negative problem orientation is the component of problem solving that has been found to be involved in the generation of excessive worry (Dugas et al., 1998). Second, a recent study into the relationship of the SPSI-R subscales to worry (Gosselin, Dugas, &

Ladouceur, 2000) found only the NPO subscale to be associated with increases in worry, and not the PPO (Positive Problem Orientation) scale. The remaining subscales of the SPSI-R-SF also showed no relationship to worry scores. Finally, as noted previously, in a study by D'Zurilla, Maydeu-Olivares and Kant (1998), a greater gender difference emerged in NPO scores than the gender difference found in PPO scores.

Why Worry-II (WW-II; Langlois et al., 1999; translation: Holowka et al., 2000) (see Appendix F). The WW-II questionnaire is a revised English version of the Why Worry questionnaire (WW: Freeston, Rheaume, Letarte, Dugas, & Ladouceur, 1994), designed to assess positive beliefs about worry. The questionnaire consists of 25 items measuring beliefs about worry on a 5-point scale (where 1 = "Not at all true" and 5 = "Absolutely true"). It is comprised of 5 factors reflecting the beliefs that (a) worry aids in problem solving, (b) worry helps to motivate, (c) worrying protects the individual from negative emotions in the event of a negative outcome, (d) the act of worrying itself prevents negative outcomes, and (e) worry is a positive personality trait. The original French version of the WW has demonstrated adequate test-retest reliability at 5 weeks (r = .71) (Dugas, Freeston, & Ladouceur, 1995), high internal consistency (α = .87 & .91), as well as criterion-related, convergent, and discriminant validity (Freeston et al., 1994). The English version of the WW-II showed a high internal consistency for its total score (α = .93) as well as for each of the factors. The questionnaire also demonstrated good test-retest reliability at 6 weeks (r = .80) (Holowka et al., 2000). As the goal of this study was to investigate the relationship between worry and the cognitive variables outlined in the model of Dugas et al. (1998), the five factors of the WW-II were not used in statistical analyses. Only the total score of the WW-II was used.

White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) (see Appendix G). The WBSI is comprised of 15 items that measure the tendency to suppress unwanted thoughts on a 5-point scale (where 1 = "Strongly disagree" and 5 = "Strongly agree"). The questionnaire has high internal consistency ($\alpha = .89$) and test-retest reliability at 12 weeks ($r = .80$) (Muris, Merckelbach, & Horselenberg, 1996). Originally assumed to be a unifactorial measure, the WBSI appears to have two separate factors, thought suppression and lack of mental control. The second factor of lack of control over one's thoughts has been construed as a variable that may be confounded with worry (Dugas et al., 1998). As such, only the scores from the thought suppression factor were retained for statistical analyses. Although cognitive avoidance in relation to worry has been conceptualized in terms of both thought suppression and the avoidance of imagery, only a measure of thought suppression was used in this study. Cognitive avoidance of imagery has typically been measured by asking participants to rate the percentage of thoughts vs. images they experience (Borkovec & Inz, 1990; Freeston, Dugas, & Ladouceur, 1996). The validity of this methodology has not been verified, and is in fact difficult to assess (Freeston et al., 1996). As such, no measurement of any cognitive avoidance of imagery was administered.

Procedure

Students were approached either during class time or immediately after the course, and were requested to participate in this study. Approximately 12 different classes were approached with a request for student participation in the study, with the majority of classes being comprised of 30 to 50 students each. The purpose of the research was briefly explained, and they were informed that participation was strictly voluntary. They

were also advised that completion of all six questionnaires took approximately 30 minutes.

Students who agreed to participate were asked to answer every question and told that there were no "correct" responses to the questions. They were requested to sign a consent form (see Appendix A) that outlined the general goal of the study and assured confidentiality of individual responses. Completion of questionnaires took place either in the classroom and submitted immediately afterward, or were taken home and returned at a later date. Participant questionnaire booklets were coded by number to protect the identity of the respondent, and the consent forms were stored separately, and kept under lock and key.

Due to information about a possible bias in reporting garnered midway through completion of testing, participant questionnaires were ultimately coded as completed under one of two conditions. The first half of the participants in this study had been told prior to completion of the questionnaires that the purpose of the research was to investigate gender differences in worry. Subsequently, it was observed by an expert in gender research that the mere mention of a gender component in a study can lead to a bias in responding, and as such it was determined that the remaining participants slated to complete the questionnaires would receive a different type of introduction. As such, participants were told that the purpose of the study was to investigate factors associated with worry, with no mention of gender. Participants were debriefed as to the gender component of the study subsequent to questionnaire completion. Both the location in which participants completed the questionnaires (i.e., at home or in class) and the type of

introduction given prior to test completion (mentioning gender or not) was noted (see Table 2).

Results

Overview of Statistical Analyses

To examine the potential effects of demographic and procedural (i.e., site of administration, and type of introduction) variables, one-way Analysis of Variance (ANOVA) procedures were used. Of primary interest were variables that showed an effect on either of the trait-like tendency to worry measures (PSWQ & WDQ). Demographic and/or procedural variables (see Tables 1 & 2) affecting worry scores were controlled using Multivariate Analysis of Covariance (MANCOVA) and Analysis of Covariance (ANCOVA) and procedures in later analyses.

To test the hypothesis that women worry to a greater extent than men, a MANCOVA using both the PSWQ and WDQ worry measures was conducted. A second MANCOVA was also performed to assess any gender differences in worry themes using the WDQ subscales as the dependent variables. For all MANCOVAS, between-group differences were assessed with follow-up ANCOVA procedures.

The replication of prior findings that intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance were strongly associated with worry was examined by correlation matrix. Process variables were subsequently placed in a MANCOVA in order to test for differences among the variables according to gender. Specific between-group differences were tested with follow-up ANCOVA procedures.

Table 2

Percentages for Nuisance Variables among Female and Male Participants

Nuisance Variable	Women	Men
	n = 221	n = 103
	%	%
Type of Introduction		
gender mentioned	66.1	55.3
gender not mentioned	33.9	44.7
Site of Administration		
at home	23.5	13.6
in the classroom	76.5	86.4

In order to assess the individual relationship between each process variable and worry according to gender, separate correlation matrices were devised for women and men. Fisher's r to z transformation was performed to determine whether the correlations between process variables and tendency to worry differed according to gender.

Preliminary Data Analyses

As the primary inferential statistics for this research were conducted through the use of MANCOVA procedures, using gender as the factor of interest, data was screened separately for both women and men. Univariate and multivariate screening tests were conducted for both groups. Missing data were not replaced, with the result that varying sample sizes occurred throughout the conducted analyses.

The data were examined for the presence of extreme values by converting all variables excluding demographic characteristics into z-scores, in order to determine whether any score was greater than three standard deviations from the mean. Extreme scores may be considered acceptable if they do not exceed 3.29 standard deviations above or below the mean (Tabachnick & Fidell, 1996). If a score was indeed found to be a univariate outlier, the value was subsequently replaced by a score that was exactly three standard deviations above or below the mean. This procedure of replacement reduces the impact an outlier can produce on statistical analyses, while maintaining its position as an extreme high or low score.

Univariate normality was assessed by calculating the skewness and kurtosis for all variables' respective distributions. The kurtosis of each univariate distribution was deemed as violating the assumption of normality if the shape of the distribution was either severely platykurtic or bimodal. Skewness for each variable distribution was

assumed to be normal if the value obtained when dividing skew by its standard error was less than +/- 5. This value for skewness was determined according to the size of the sample ($N > 60$), as larger samples increase the asymmetry of a distribution. The distribution of scores was found to be significantly skewed for the intolerance of uncertainty scale (IUS) among the female group (skew = 6.17, $p < .01$). The skew was moderately positive, therefore scores on the IUS variable were transformed by square root (Tabachnick & Fidell, 1996) for both groups. Subsequent verification of skew for both the male and female groups indicate that it was no longer significant.

Linearity was verified by examining the graphical representation of the relationship between the PSWQ and the remaining variables of interest (i.e., IUS, SPSI-R-SF, WW-II, and WBSI). The assumption of linearity was assumed to be violated if a curvilinear relationship was detected. No curvilinear representations were found.

Multivariate outliers were verified by calculating both Mahalanobis' distance and Cook's distance. All relevant variables were entered, with the PSWQ entered as the dependent variable, and the resultant Mahalanobis distance scores were compared against the χ^2 critical value of 26.125 ($p < .001$) in order to determine whether it was a multivariate outlier. Six scores among the women and two scores among the men surpassed the critical value of 26.125, however no score was greater than the Cook's distance criterion of 1, therefore no scores were deleted. A multivariate outlier is assumed to be influencing the regression if Cook's distance is greater than 1. The presence of multicollinearity and singularity among measures was also examined. No significant overlap was found between any of the variables used in the study.

Means and standard deviations for the process variable measures, the trait worry measures, and selected subscales are presented for the female and male group in Table 3. Although scores on the IUS were transformed by square root, with the resultant revised scores being used in all statistical analyses, the original scores are reported in Table 3. Means and standard deviations are based on the revisions made for extreme scores.

Descriptive statistics

One-way ANOVAs were conducted for both trait worry measures (WDQ & PSWQ) with the demographic and procedural variables, in order to determine any potential confounding effect. Demographic variables were field of study, year of study, and university status. Procedural variables were site of test administration, and type of introduction given prior to testing. ANOVA procedures were conducted with the males and females grouped together. As the demographic variable of age is not discrete, an ANOVA could not be performed to determine the potential effect of age on worry scores. A correlation matrix between both worry measures and age was therefore devised.

All ANOVA and correlational procedures that determined demographic and procedural variables as having a significant effect on the study variables of worry are presented in Table 4. Type of introduction was found to have an effect on the PSWQ score (F (1, 321) = 6.81, $p < .01$), and the WDQ total score (F (1, 320) = 4.08, $p < .05$), with the mention of gender in the introduction significantly increasing worry scores. The variables of year and field of study, university status, and site of administration did not significantly affect worry scores. The age of participants did not show a significant correlation to scores on either the WDQ ($r = -.03$, ns) or the PSWQ ($r = -.01$, ns) The size of the effect for significant ANOVA procedures was calculated by the percent of variance

Table 3

Descriptive Statistics for all Variables and Associated Sub-Scales for Female and Male Groups

	Females		Males	
	Mean	SD	Mean	SD
Trait Worry (PSWQ)	49.57	14.26	41.43	14.18
Trait Worry (total score- WDQ)	38.25	18.54	32.78	19.21
Worry Themes:				
Relationships	6.20	4.52	5.21	
4.26studie				
Lack of Confidence	8.45	4.79	6.11	4.46
Aimless Future	7.85	4.76	7.31	5.00
Work Incompetence	8.22	4.39	7.25	4.35
Finances	7.56	4.91	6.89	4.90
Intolerance of Uncertainty (IUS)	58.54	19.86	54.70	17.37
Negative Problem Orientation (SPSI-R-SF subscale)	8.70	4.31	6.74	4.17
Beliefs about Worry (WW-II total score)	48.48	15.31	48.84	16.79
Thought Suppression (WBSI subscale)	50.08	12.58	44.33	14.00

Note: PSWQ = Penn State Worry Questionnaire; WDQ = Worry Domains Questionnaire; IUS = Intolerance of Uncertainty Scale; SPSI-R-SF = Social Problem-Solving Inventory-Revised-Short Form; WW-II = Why Worry? 2nd edition; WBSI = White Bear Suppression Inventory.

Table 4

Selected ANOVA Summary Tables for The Effect of Nuisance Variables on Trait Worry Scores

TYPE OF INTRODUCTION

Source	SS	df	MS	F	p
PSWQ	1448.53	1	1448.53	6.81	.009
Error	68239.64	321	212.58		
Total	69688.16	322			

TYPE OF INTRODUCTION

Source	SS	df	MS	F	p
WDQ total score	1444.88	1	1444.88	4.08	.044
Error	113212.47	320	353.79		
Total	114657.35	321			

accounted for, R^2. An effect size is considered to be small if it is below .059 (Feingold, 1995). Type of introduction had a small effect on both the PSWQ ($R^2 = .021$)and the WDQ ($R^2 = .013$).

Although the size of the effect of type of introduction was small, the significant effect on both measures of the tendency to worry might affect the main analyses. As such, type of introduction was covaried out of all analyses through the use of MANCOVA, ANCOVA, and partial correlation matrices, in order to ensure that type of introduction does not affect the results.

Tendency to Worry and Worry Themes

In order to determine whether women report greater worry than men, a MANCOVA was performed with gender as the independent variable and both trait worry measures, the PSWQ and the WDQ, as the dependent variables. As stated previously, type of introduction was the covariate in the analysis. The MANCOVA emerged significant (F (2, 317) = 10.87, $p < .01$), with subsequent ANCOVAs revealing between-group differences being found for both the PSWQ (F (1, 318) = 20.35, $p < .01$) and the WDQ total score (F (1, 318) = 4.92, $p < .05$). For both measures, women reported a greater tendency to worry than men.

A second MANCOVA was conducted with gender as the independent variable, and all five WDQ subscales (Relationships, Lack of Confidence, Aimless Future, Work Incompetence, and Finances) as the dependent variables. This was executed in order to examine gender differences in specific worry themes. The second MANCOVA emerged significant (F (5, 315) = 4.58, $p < .01$), and follow-up ANCOVA procedures found a significant gender difference in the worry theme Lack of Confidence (F (1, 319) = 15.62,

$p < .01$), with women reporting significantly greater worries dealing with lack of confidence than men.

Process Variables Related To Worry

In order to verify the relationship between the tendency to worry and the variables of intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance, a correlation matrix for the entire sample between all the main study variables was devised (see Table 5). Type of introduction was partialed out of all correlations. The IUS, the Negative Problem Orientation subscale of the SPSI-R-SF, the WW-II, and the Thought Suppression subscale of the WBSI, were all highly positively correlated with both the PSWQ and the WDQ. Reporting higher scores on the tendency to worry was related positively with scores on all the process measures. As there was a strong association between the process measures and trait worry, a MANCOVA was conducted on the four measures in relation to gender. The MANCOVA had significant results (F (4, 306) = 6.95, $p < .01$), and subsequent ANCOVAs showed significant between-group differences for the Thought Suppression subscale of the WBSI (F (1, 309) = 17.05, $p < .01$) and the Negative Problem Orientation subscale of the SPSI-R-SF (F (1, 309) = 11.84, $p < .01$). Mean scores on both Thought Suppression and Negative Problem Orientation were significantly higher for the female group than the male group.

In order to determine whether the process variables of Negative Problem Orientation and Thought Suppression accounted for the relationship between gender and worry, two ANCOVAs were conducted. The first ANCOVA determined whether PSWQ scores differed according to gender, after controlling for scores on the NPO and Thought Suppression scales. The second ANCOVA determined whether WDQ scores differed

Table 5

Partial Correlation Between Tendency to Worry and Process Variables for Total Sample (Controlling for Type of Introduction)

Variable	PSWQ	WDQ	IUS	Negative PO	WW-II	Suppression
PSWQ	-	.69***	.70***	.65***	.51***	.49***
WDQ		-	.69***	.70***	.47***	.51***
IUS			-	.67***	.50***	.44***
Negative PO				-	.42***	.46***
WW-II					-	.34***
Suppression						-

Note: PSWQ = Penn State Worry Questionnaire; WDQ = Worry Domains Questionnaire; IUS = Intolerance of Uncertainty Scale; Negative PO = Negative Problem Orientation subscale of the Social Problem-Solving Inventory- Revised-Short Form; WW-II = Why Worry Questionnaire- revised 2nd version; Suppression = Thought Suppression subscale of the White Bear Suppression Inventory.
*** $p < .001$

according to gender after controlling for scores on the NPO and Thought Suppression scales. It was found that after covarying out NPO and Thought Suppression scores, gender ceased to significantly predict worry scores on both the PSWQ (F (3, 313) = 3.48, ns) and the WDQ (F (3, 313) = 2.55, ns).

As stated previously, all four process measures were highly correlated with the total sample tendency to worry. In order to determine whether there exists a differential association between the process measures and worry according to gender, separate correlation matrices were devised. The separate correlations for the female group and the male group are presented in Table 6 and Table 7 respectively. Fisher's r to z transformation was conducted in order to determine whether any differences in the correlations between tendency to worry and the process measures among the female and male groups were significant. A significant difference in the correlation between the WDQ and the WW-II was found ($z = 2.23$, $p < .05$), with the males having a significantly higher correlation between scores on the WDQ and the WW-II than females. There were no other significant differences according to gender among the correlations between the process measures and trait worry scores.

As women had higher trait worry scores than men, it was postulated that the aforementioned findings may be an artifact of the higher worry scores generated by women, worry scores thereby being a confounding factor. Recent data shows that the WW-II is more highly related to trait worry in low worriers than in high worriers (Holowka et al., 2000). As such, a partial correlation between the WDQ and the WW-II total score was conducted, controlling for worry scores with the PSWQ. It was found that the relationship between the WW-II and the WDQ remained for men ($r = .30$, $p < .002$),

Table 6

Partial Correlation Between Tendency to Worry and Process Variables for Female Sample (Controlling for Type of Introduction)

Variable	PSWQ	WDQ	IUS	Negative PO	WW-II	Suppression
PSWQ	-	.69***	.70***	.63***	.47***	.48***
WDQ		-	.69***	.67***	.40***	.55***
IUS			-	.66***	.44***	.47***
Negative PO				-	.38***	.46***
WW-II					-	.34***
Suppression						-

Note: PSWQ = Penn State Worry Questionnaire; WDQ = Worry Domains Questionnaire; IUS = Intolerance of Uncertainty Scale; Negative PO = Negative Problem Orientation subscale of the Social Problem-Solving Inventory- Revised-Short Form; WW-II = Why Worry Questionnaire- revised 2nd version; Suppression = Thought Suppression subscale of the White Bear Suppression Inventory.
*** $p < .001$

Table 7

Partial Correlation Between Tendency to Worry and Process Variables for Male Sample (Controlling for Type of Introduction)

Variable	PSWQ	WDQ	IUS	Negative PO	WW-II	Suppression
PSWQ	-	.66***	.70***	.64***	.63***	.40***
WDQ		-	.71***	.75***	.61***	.38***
IUS			-	.69***	.65***	.36***
Negative PO				-	.52***	.38***
WW-II					-	.38***
Suppression						-

Note: PSWQ = Penn State Worry Questionnaire; WDQ = Worry Domains Questionnaire; IUS = Intolerance of Uncertainty Scale; Negative PO = Negative Problem Orientation subscale of the Social Problem-Solving Inventory- Revised-Short Form; WW-II = Why Worry Questionnaire- revised 2nd version; Suppression = Thought Suppression subscale of the White Bear Suppression Inventory.
*** $p < .001$

but was no longer significant for women ($r = .12$, ns). Fisher's r to z transformation was conducted in order to determine whether the difference between the two correlations was significant. The difference was not found to be significant after controlling for worry scores ($z = 1.70$, $p < .07$, ns).

Discussion

The aim of this study was to investigate gender differences in worry, and its related process variables. It was anticipated that an exploratory investigation into the relationship of intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance to both high worry and gender might shed light on the processes involved in the differential gender experience of worry and anxiety.

Tendency to Worry and Worry Themes

As expected from the first hypothesis, women in this research reported a greater tendency to worry than men, and this on both measures of trait worry. It has consistently been found throughout the literature that women appear to worry more than men. This finding has been shown both in their higher worry scores, and in their overrepresentation among study samples of high worriers (Stavosky & Borkovec, 1988).

A preliminary discovery in this research pertains to the elevated scores of women compared to men in relation to the worry theme dealing with lack of confidence. This finding substantiates the second hypothesis of the study, namely that women and men would vary in the types of worries they reported. Both genders appear to worry at equal levels about such concerns as their finances, their future, their interpersonal relationships, and their competence in the workplace, however, self-confidence issues appear to be a greater consideration among women. For example, women endorsed items such as "I

worry that others will not approve of me" or "I worry that I might make myself look stupid" more than men. This finding is in accordance with prior research. Notably, research on gender differences has shown that from a young age women tend to attribute failure to lack of ability (Ryckman & Peckham, 1987). Moreover, women have been found to report a greater lack of self-confidence than men both in the workplace and in relation to academic performance (see Hoyenga & Hoyenga, 1993). Although it is unclear as to whether this finding is real or an artifact of response bias, it does appear that women report greater concern about confidence issues than men.

Cognitive Process Variables and Gender

The hypothesis that the cognitive-behavioural model of excessive worry devised by Dugas and colleagues (1998) would be supported in this study was confirmed. In the correlation matrix examining the relationship between worry scores and the four process variables, the results were as expected. All process variables were strongly associated with worry. Specifically, it was found that increases in worry were related to increases in all four variables. As stated previously, all correlations between the process measures and both measures of worry were greater than $r = .40$. This finding lends further credence to the postulate that intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance are involved in excessive worry.

The exploratory hypothesis that differences might emerge among the process variables according to gender was substantiated. Specifically, women in the sample reported significantly higher levels of thought suppression and negative problem orientation. The increased tendency of women to endorse negative problem orientation may be viewed as an expected finding in that prior research has found a gender difference

in this facet of problem solving (D'Zurilla, Maydeu-Olivares, & Kant, 1998; Gosselin et al., 2000). In fact, men have consistently been found to exhibit greater problem-solving appraisal and confidence than women (Brems & Johnson, 1989). The gender difference in problem orientation may be highly specific as well, as research on actual problem solving skills, that is problem definition and goal formulation, generation of alternative solutions, decision making, and solution implementation and verification, has found no significant gender differences (Nezu & Nezu, 1987). Furthermore, the discovery that women would endorse a lack of problem-solving confidence and the perception of a problem as a threat, is in alignment with their increased reporting of worry about lack of confidence issues, thereby corroborating previous findings.

The finding that women engaged in thought suppression more than men was a surprising discovery. Cognitive avoidance has not been found to show a significant gender difference. There has, however, been indirect evidence of a gender effect in terms of the enhancement effect, which is a direct result of thought suppression. Research has shown that levels of obsessionality increase as thought enhancement increases, although this finding has emerged solely for women. For men, the correlation was negative (Rutledge, 1998). Although the aforementioned results do not pertain to the construct of worry, but rather to the etiology of obsessive-compulsive disorder, they can be construed as an illustrative example of a differential effect of thought suppression among women and men.

Cognitive Process Variables and the Link to Worry

The presence of increased thought suppression and negative problem orientation in women can tentatively be regarded as corroboration for the hypothesis that cognitive process variables would show quantitative differences according to gender.

These results, however, were found without consideration for level of worry. That is, when level of worry was not statistically controlled, higher scores on negative problem orientation and thought suppression emerged. As women were found to report a greater tendency to worry than men, increases in thought suppression and negative problem orientation in women may be associated with women's increased worry. A more complex picture of the tendency to worry as it relates to gender developed when the relationships between process variables and worry were investigated separately for women and men.

Using separate correlation matrices for women and men, it was revealed that although intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance were strongly related to increasing levels of worry for both women and men, there were slight differences in the strength of the specific correlations. Notably, the association between positive beliefs about worry and the tendency to worry was significantly stronger in men prior to controlling for worry scores. However, the greater sensitivity of positive beliefs about worry among men was reduced to a non-significant trend after controlling for level of worry. It can be postulated that none of the cognitive variables used in this study have a more sensitive relationship to worry in either gender. However, it can also be contended that, as the relationship between positive beliefs about worry and trait worry showed a non-significant trend toward being stronger in men than in women, a differential association according to

gender may emerge upon replication. If the former postulate is maintained, it can be asserted that increases in intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance are all uniformly associated with increases in worry regardless of gender. That is, none of the variables have a more sensitive relationship to worry based on the gender of an individual. If, however, the latter contention is assumed, increases in positive beliefs about the functions of worry can be deemed more closely associated with increases in worrying in men than in women. This finding would substantiate the hypothesis that, at similar levels of worry, certain cognitive process variables are more sensitive in their relationship to worry in one gender than another.

It is noteworthy that intolerance of uncertainty maintained not only a strong relationship with both worry measures, regardless of whether the participant sample was separated or combined, but also that it showed no gender differences in the sensitivity of its relationship with worry. According to the results, increases in intolerance of uncertainty are strongly related to increases in the tendency to worry, and this finding emerged across gender. This is in accordance with previous investigations that have found intolerance of uncertainty to be specific to the construct of worry, and to be the primary contributing variable involved in the generation of excessive worry (Lachance, Ladouceur, & Dugas, 1999).

Why do Women Worry More?

One of the longstanding questions concerning the gender difference in the reporting of worry and anxiety has been "why do women worry more than men?". Although there has been a paucity of research conducted to answer this question, the few

investigations undertaken have only partially accounted for the gender difference in worry. As stated previously, it was postulated that the gender-role of masculinity and the variable of social desirability may account for the differential gender reporting of worry (McCann, Stewin, & Short, 1991). That is, the researchers hypothesized that men may report less worry because they consider worry to be a feminine characteristic, and because they wish to portray themselves in a socially desirable manner. It has in fact been found that women are perceived as "worriers" more than men by both genders (Wood, Conway, & Dugas, 2000). It was also previously postulated that psychosocial variables such as self-esteem, social competence, social support, and self-rated health might account for the gender difference (Lewinsohn et al., 1998). In both studies, the hypothesized variables contributed to the gender difference in worry report, however, when the variables were controlled, women still reported greater worry and anxiety. Lewinsohn and colleagues (1998) tentatively stated that their findings were "consistent with the formulation that the female vulnerability to anxiety is associated with some type of genetic, rather than purely environmentally determined, gender difference" (p. 113). Their conclusions are based on the original conceptualization of women's increased reporting of worry and anxiety as being placed within one of two broad frameworks. The female preponderance is explained as either due to genetic and biological factors, or the different environmental experiences and social roles of women and men. As no research has specifically attributed biological or genetic factors to the cause of negative problem orientation or thought suppression, Lewinsohn and colleagues' statement may have been premature. The findings of this study have shown that once negative problem orientation and thought suppression are controlled, gender no longer significantly predicts worry

scores. It may therefore be that women's more negative problem orientation, combined with their increased engagement in thought suppression, might account for female's elevated reporting of worry.

If, however, women do in fact engage in greater thought suppression and negative problem orientation than men, how might this account for their greater worry report? In reference to thought suppression, it has previously been established that attempting to suppress a thought can paradoxically result in an increase of that thought, either during the actual suppression (enhancement effect) or subsequent to it (rebound effect). If women are more likely to engage in thought suppression, they might actually experience a resurgence of their worrisome thoughts to a greater frequency than men, hence a resultant increase in women's report of worry. Further, negative problem orientation refers to an individual's belief in their ability to solve problems, in that individuals with high negative problem orientation have little confidence in their abilities, and tend to view problems as threats. If women have a greater negative problem orientation than men, it can be postulated that regardless of their actual problem-solving abilities, they believe themselves less capable of handling their problems, and may be reluctant to practically apply their problem-solving skills. As a consequence, problems are more threatening, which can be considered worrisome, and are less likely to be solved, thereby maintaining the worry.

A question nevertheless remains as to why women engage in thought suppression and negative problem orientation to a greater extent than men. As there has been no direct investigation seeking to explain the gender difference in either thought suppression or negative problem orientation, several possibilities may be conjectured.

Thought Suppression. Considerable debate has been generated over the similarities between anxiety and depression (Clark & Watson, 1991; Dobson, 1985), with some researchers postulating that both disorders may be different manifestations of the same underlying problem (Ingram & Malcarne, 1995). Therefore, an understanding of the gender difference in depression may potentially answer questions generated from the study of gender and worry. As with worry, there are a disproportionately greater number of women who report depression than men (Bebbington, 1988). Research into the cause of the gender discrepancy in depression has generated numerous hypotheses (see Nolen-Hoeksema, 1987), however a promising theory is that of response sets, that is, the ways in which an individual responds to, and copes with, his or her mood. It has been proposed that when women are mildly depressed, they engage in a ruminative style of coping, whereas men engage in active strategies of distraction (Nolen-Hoeksema, 1987). Specifically, in a study conducted to determine what women and men do when they feel depressed, it was found that men reported engaging in physical or social activities (e.g., play sports) to a significantly greater extent than women when depressed. These activities would tend to distract the individual from their depression. Conversely, women reported thinking about their feelings, crying to reduce the tension, or talking about their depression, to a significantly greater extent than men. These activities tend to focus on and maintain the individual's depressed mood (see Nolen-Hoeksema, 1987). Nolen-Hoeksema further asserted that women's ruminative response style is "a cause of their greater tendency toward depression, whereas men's response tendencies actually lessen their rates of depression" (p. 274).

If women do in fact engage in rumination significantly more than men when depressed, this style of coping may account for women's greater report of thought suppression. Both thought suppression and rumination can be conceptualized as involving a preoccupation with negative thoughts. Although counterintuitive at first glance, as suppression connotes avoidance of thoughts and rumination connotes emphasis on thoughts, individuals engaging in either activity are consciously directing attention toward their negative cognitions. Previous research has in fact linked the processes of rumination and suppression (Gold & Wegner, 1995). Thought suppression can further be distinguished from the distraction strategies that men endorse to a significantly greater extent. Distraction typically involves engaging in pleasant activities to divert one's self from a negative mood, whereas suppression is an attempt to keep one's mind off a thought. It has been shown that trying to forget something without actively focusing on something else is not as successful as using active positive distracters (Wenzlaff, Wegner, & Roper, 1988).

To date, the reasons behind why women might be more likely to place emphasis on their thoughts, while men opt to distract themselves from their thoughts, has not been fully investigated. It has been postulated that women are socialized from a young age to express emotionality, whereas men are encouraged to "be strong" and refrain from displaying emotions such as worry and depression. Studies have shown that parents often have stereotypical beliefs about what type of emotional expression is appropriate depending on the gender of their children (Block, 1978; Maccoby & Jacklin, 1974). The cause for the different response sets of women and men when faced with worrisome cognitions, however, is still a subject for further experimental investigation.

Negative Problem Orientation. A concomitant effect of thought suppression, and the resultant increase in thoughts, is a feeling of lack of control over one's thoughts. This lack of mental control has been found to threaten self-esteem and can lead to feelings of failure (Wegner & Pennebaker, 1993). It may be that negative problem orientation is partly due to this feeling of failure, in that women's confidence in their ability to succeed in solving problems, as well as their perceived control over effective problem-solving, is greatly reduced, given their belief that they have failed in controlling their thoughts. In other words, failing at controlling one's thoughts may substantiate the belief that one would also fail at solving problems. Although this postulate assumes that thought suppression would precede negative problem orientation, a notion that has not been found in research, it may be that the feeling of loss of control generated by thought suppression only further reinforces a preexisting negative problem orientation.

An alternate explanation may be that women most often endorse "powerless" emotions than men, reducing their perceived control and confidence in problem solving. Numerous studies have found that women are less reluctant to express feelings of sadness, fear, and worry, whereas men are more likely to express emotions such as anger and pride (Brody, Lovas, & Hay, 1995; Fischer, 1993). The concept of power in emotion has been shown in the fact that if a negative event is appraised as caused by unknown factors, being out of one's control, and beyond one's coping resources, the experienced emotion is likely to be sadness or worry. This appraisal, and the resultant emotional expression, is perceived as displaying powerlessness and vulnerability. Conversely, anger and pride is most likely expressed when an event is appraised as caused by external factors, within one's control, and as one that can be changed (Timmers, Fischer, &

Manstead, 1998). If women do in fact express emotions that display powerlessness and vulnerability to a greater extent than men, they may be more likely to believe a problem is out of their control and beyond their ability to cope, as such, giving rise to a greater negative problem orientation than men.

The finding that negative problem orientation and thought suppression may account for the relationship between worry and gender would go a long way toward explaining why women report a greater tendency to worry than men. However, as this research is a preliminary investigation of the relationship between worry, gender, and cognitive process variables, these findings need to be replicated. Moreover, it should be noted that although a gender difference among process variables was found, the amount of variance accounted for by negative problem orientation and thought suppression was small. Specifically, by calculating the size of the effect through $\underline{R}^2$, thought suppression is found to account for $\underline{R}^2 = .052$, and negative problem orientation has an $\underline{R}^2$ of .037. As stated by Feingold (1995), an effect size of $\underline{R}^2 < .059$ may be considered small.

Conversely, when looking at the spectrum of literature reporting gender differences, several issues arise. First, it appears that although the gender of an individual can affect functioning along several psychological dimensions (see Banaji, 1993), the actual size of gender differences tends to be rather small, often accounting for only 1 to 5% of the variance (Deaux, 1984; Hyde, 1981). Second, a longitudinal analysis of male and female test scores from the 1940's to the 1980's has shown that cognitive gender differences, notably in relation to spatial and verbal differences, appear to be diminishing, most likely due to changes in the social climate (Feingold, 1988). As such, a large gender difference within this study could not realistically be expected, and the small gender

difference is what would be anticipated from such heterogeneous groups as women and men. It may be that the cognitive variables found to differentially account for worry according to gender in this study are two of several psychological factors that influence the greater preponderance of worry reported by women. That is, negative problem orientation and thought suppression may be important factors in explaining why women worry more than men, but they most likely do not represent the whole picture.

How Do Women and Men Worry?

A second question that necessarily emerges from the study of gender differences in worry, relates to the process of worry in both women and men. The focus would then not be why women worry more, but rather how women worry differently from men. In essence, if men report worry less than women, do they experience worry differently than women?

The finding that intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance are all strongly associated with worry, substantiates previous research that asserts these processes are elemental to the generation of worry. However, the sensitivity of these individual variables to worry in relation to gender remains a question due to the non-significant trend of a closer relationship between positive beliefs about worry and reported worry in men. One of two possible explanations for these findings can be given. First, it may be contended that there is in fact no difference in the sensitivity of relationship between the four cognitive variables and trait worry in women and men. Thereby, intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance do not show a closer relationship to either men or women's report of worry. However, a

second possible explanation may be that one of the variables, namely positive beliefs about worry, has a closer relationship to worry in one gender (i.e., men) than in the other. If this latter explanation is correct, and men's report of worry has a close relationship to positive beliefs about worry, then further research might endeavour to discover the reason for this occurrence. It can be postulated that men have more confidence in their abilities, and those who worry choose to view worrying cognitions as a constructive tool to solving problems. As such, men may have more positive beliefs about their worry prior to actually engaging in worry. However, due to the fact that men did not report significantly more positive beliefs about worry than women regardless of level of worry, these faulty assumptions may therefore be a consequence of increased worry rather than a precursor. If this is the case, an alternate explanation may be that the need for social desirability led to a reporting bias, wherein males who did report high worry felt the need to justify this behaviour and therefore endorsed more positive beliefs about worry. It has been previously discovered that worrying is considered a feminine trait, and males who do worry might need to endow their worrying with practical purposes. Future research would need to be directed toward understanding the relationship between worry and positive beliefs about worry among women and men in greater depth.

Limitations

A limitation of this study concerns the abandonment of subscales and factors derived from the primary study variables. As formerly stated, the WW-II, and the SPSI-R-SF are both comprised of several factors. Of the five subscales in the SPSI-R-SF, only the Negative Problem Orientation subscale was retained for the main statistical analyses. In the WW-II, the five factors of the measure were not investigated individually, but

rather added together in order to use the total score of the WW-II in subsequent analyses. The decision not to include the subscales of the SPSI-R from analysis was based on theoretical considerations. As previously stated, a recent study by Gosselin and colleagues (2000), found no significant difference between moderate and high worriers on any of the SPSI-R-SF subscales other than the Negative Problem Orientation scale. Moreover, when participants were classified as either high or moderate worriers, only the NPO scores differed between the two groups. Since the other subscales did not distinguish the high and moderate worriers, they were not retained for the analyses of this study. The decision to use the total score of the WW-II rather than each of its subscales, however, was based on the preliminary nature of the research. As no hypotheses concerning the relationship between the cognitive process variables and worry were devised, it was determined that only the four process variables identified by Dugas and colleagues (1998) as linked to excessive worry, would be targeted. The cognitive variable of positive beliefs about worry was therefore analyzed in the form of a total score, and not in terms of its subscales.

Another limitation in this study relates to the fact that although cognitive avoidance is believed to maintain worry through both thought suppression and cognitive avoidance of imagery, only thought suppression was investigated. As stated previously, the methodology used at present to assess the cognitive avoidance of imagery has not undergone testing for validity, and as such was not used. However, given the finding of a significant gender difference in thought suppression within this study, research into possible gender differences in cognitive avoidance may reveal interesting results.

A final limitation of this research was the participant pool under study. First, there was a largely unequal gender distribution, with half as many men being tested as compared to women. As the focus of this research was on differences between women and men, the fact that there were significantly fewer men might have affected the results of the study. Notably, the power of a statistical test is determined, to a large extent, by the smallest group under study. As there were fewer men in the sample than women, the power of the statistical results may have been decreased. Second, the sample in this study was comprised exclusively of undergraduate university students, rather than a random sample derived from the general population. Because of this choice of sample, the generalizability of the present findings can be placed in question. Replication of the present study with a random sample of participants from the population at large would need to be undertaken.

Future Directions

As the present study was preliminary in nature, there are numerous related avenues of inquiry for future research. First, in relation to the measures of the study, and the tentative nature of the findings, it would be necessary to replicate this research. Particularly, future investigations could focus on the cognitive process variables of negative problem orientation, positive beliefs about worry, and thought suppression individually in order to develop a fuller understanding of their relationship to worry according to gender. Measures such as the WW-II are comprised of factors that were not investigated individually in this research, but rather incorporated together to create a total score. However, due to the current finding of a potential difference in women and men's worry in relation to positive beliefs about worry, future investigation into possible gender

differences in the factors of the WW-II is warranted. The factors found in the measure of positive beliefs about worry include problem solving, motivation, protection from negative emotions, protection from negative events (superstition), and positive personality trait. These factors may show particular gender effects that elucidate a clearer comprehension of the differential worry experience noted in the present research. Notably, some of the factors may show greater sensitivity among men than women. The total score on the WW-II may have clouded the greater sensitivity of individual sub-scales, resulting in a trend toward greater sensitivity in men, rather than a significant difference.

The increased reporting of thought suppression found in this study could also undergo more rigorous testing in the future. It has been postulated in this research that suppression may be similar to rumination, thereby accounting for the gender difference in thought suppression. However, if this hypothesis is true, there are numerous avenues of inquiry that need to be undertaken. Notably, research can be done to determine whether thought suppression is truly more prevalent in worry, and rumination is more prevalent in depression. If this were true, both response styles might in fact be different expressions of the same underlying process. Alternately, rumination and suppression may be present in both worry and depression, whereby it can be postulated that perhaps one leads to the other.

The present study was comprised primarily of young adult participants. However, research has shown that the experience of worry changes according to age. Studies investigating the tendency to worry among both adolescents (Laugesen & Dugas, 2000) and the elderly (Wisocki, 1988) have shown that the reporting of worry is not uniform

across the lifespan, and it can be postulated that gender differences in relation to worry may vary according to age as well. Research on age differences within some of the cognitive process variables has also emerged, notably the subscales of the SPSI-R (D'Zurilla et al., 1998), pointing to the hypothesis that the relationship of the four cognitive process variables used in this study might show differential relationships across both gender and age.

Finally, as stated previously, all individuals experience worry, albeit to varying degrees. As such, a continuum exists between the worries of healthy individuals and the excessive, uncontrollable worries of individuals with Generalized Anxiety Disorder. Investigating processes related to worry in non-clinical populations allows for a better understanding of the key feature in Generalized Anxiety Disorder, and may ultimately explain how one passes from normal to excessive worries. Future research might therefore be directed toward determining whether gender differences within the cognitive process variables of intolerance of uncertainty, negative problem orientation, positive beliefs about worry, and cognitive avoidance are present within a clinical population as well.

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Appendix A:

Consent Form

Consent Form to Participate in Research

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

A. PURPOSE

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

B. PROCEDURE

I have been informed that the study involves the following procedures: I will be requested to fill out six (6) questionnaires dealing with worry, and one (1) questionnaire on gender roles.
There is no deception in the experiment and I will not be required to do any task other than that described above. Any general information I give will not be associated with my data in the experiment. The signed consent form will not be kept with the responses to the questionnaires; all these documents will be kept under lock and key.
The responses I make to the questionnaires will not be kept with the signed consent form. I understand that my participation in the experiment, and the information and data I provide, will be kept strictly confidential.

C. CONDITIONS OF PARTICIPATION

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

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

NAME (please print) _____
SIGNATURE _____
WITNESS SIGNATURE _____
DATE _____

Appendix B:

Penn State Worry Questionnaire

PSWQ

Enter the number that best describes how typical or characteristic each item is of you, putting the number next to each item.

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

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

___ 2. My worries overwhelm me.

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

___ 4. Many situations make me worry.

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

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

___ 7. I am always worrying about something.

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

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

___ 10. I never worry about anything.

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

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

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

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

___ 15. I worry all the time.

___ 16. I worry about projects until they are all done.

Appendix C:

Worry Domains Questionnaire

WDQ

Please indicate the appropriate number from the scale below to show how much you **worry** about the following:

0	1	2	3	4
not at all	a little	moderately	quite a bit	extremely

I worry...

1. ____ that my money will run out.

2. ____ that I cannot be assertive or express my opinions.

3. ____ that my future job prospects are not good.

4. ____ that my family will be angry with me or disapprove of something that I do.

5. ____ that I'll never achieve my ambitions.

6. ____ that I will not keep my workload up to date.

7. ____ that financial problems will restrict holidays and travel.

8. ____ that I have no concentration.

9. ____ that I am not able to afford things.

10. ____ that I feel insecure.

11. ____ that I can't afford to pay bills.

12. ____ that my living conditions are inadequate.

13. ____ that life may have no purpose.

14. ____ that I don't work hard enough.

15. ____ that others will not approve of me.

16. ____ that I find it difficult to maintain a stable relationship.

17. ____ that I leave work unfinished.

18. _____ that I lack confidence.

19. _____ that I am unattractive to the opposite sex.

20. _____ that I might make myself look stupid.

21. _____ that I will lose close friends.

22. _____ that I haven't achieved much.

23. _____ that I am not loved.

24. _____ that I will be late for an appointment.

25. _____ that I make mistakes at work.

Appendix D:

Intolerance of Uncertainty Scale

IUS

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

1	2	3	4	5
not at all characteristic of me	a little characteristic of me	somewhat characteristic of me	very characteristic of me	entirely characteristic of me

1. ___ Uncertainty stops me from having a firm opinion.
2. ___ Being uncertain means that a person is disorganized.
3. ___ Uncertainty makes life intolerable.
4. ___ It's unfair not having any guarantees in life.
5. ___ My mind can't be relaxed if I don't know what will happen tomorrow.
6. ___ Uncertainty makes me uneasy, anxious, or stressed.
7. ___ Unforeseen events upset me greatly.
8. ___ It frustrates me not having all the information I need.
9. ___ Uncertainty keeps me from living a full life.
10. ___ One should always look ahead so as to avoid surprises.
11. ___ A small unforeseen event can spoil everything, even with the best of planning.
12. ___ When it's time to act, uncertainty paralyses me.
13. ___ Being uncertain means that I am not first rate.
14. ___ When I am uncertain, I can't go forward
15. ___ When I am uncertain I can't function very well.
16. ___ Unlike me, others always seem to know where they are going with their lives.
17. ___ Uncertainty makes me vulnerable, unhappy, or sad.

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

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

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

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

22. ___ Being uncertain means that I lack confidence.

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

24. ___ Uncertainty keeps me from sleeping soundly.

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

26. ___ The ambiguities in life stress me.

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

Appendix E:

Social Problem-Solving Inventory-Revised Short Form

SPSI-R (SF)

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

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

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

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

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

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

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

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

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

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

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

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

11. ___ Difficult problems make me very upset.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix F:

Why Worry? questionnaire-2nd version

WW-II

Below are a series of statements that can be related to worry. While reading these statements, please think back to times when you are worried, and indicate to what extent these statements are true for you (write the number at the beginning of each statement).

1	**2**	**3**	**4**	**5**
Not at all true	Slightly true	Somewhat true	Very true	Absolutely true

1. _____ If I did not worry, I would be careless and irresponsible.

2. _____ If I worry, I will be less disturbed when unforeseen events occur.

3. _____ I worry in order to know what to do.

4. _____ If I worry in advance, I will be less disappointed if something serious occurs.

5. _____ The fact that I worry helps me plan my actions to solve a problem.

6. _____ The act of worrying itself can prevent mishaps from occurring.

7. _____ If I did not worry, it would make me a negligent person.

8. _____ It is by worrying that I finally undertake the work that I must do.

9. _____ I worry because I think it can help me find a solution to my problem.

10. _____ The fact that I worry shows that I am a person who takes care of their affairs.

11. _____ Thinking too much about positive things can prevent them from occurring.

12. _____ The fact that I worry confirms that I am a prudent person.

13. _____ If misfortune comes, I will feel less responsible if I have been worrying about it beforehand.

14. _____ By worrying, I can find a better way to do things.

15. _____ Worrying stimulates me and makes me more effective.

16. _____ The fact that I worry incites me to act.

17. _____The act of worrying itself reduces the risk that something serious will occur.

18. _____ By worrying, I do certain things which I would not decide to do otherwise.

19. _____ The fact that I worry motivates me to do the things I must do.

20. _____ My worries can, by themselves, reduce the risks of danger.

21. _____ If I worry less, I decrease my chances of finding the best solution.

22. _____ The fact that I worry will allow me to feel less guilty if something serious occurs.

23. _____ If I worry, I will be less unhappy when a negative event occurs.

24. _____ By not worrying, one can attract misfortune.

25. _____ The fact that I worry shows that I am a good person.

Appendix G:

White Bear Suppression Inventory

WBSI

This questionnaire deals with thoughts. There are no right or wrong answers, so please respond honestly to each of the statements presented below. Please indicate your answers by writing the appropriate number from the scale.

1	2	3	4	5
strongly disagree	moderately disagree	neutral or don't know	moderately agree	strongly agree

1. ____ There are things I prefer not to think about.

2. ____ Sometimes I wonder why I have the thoughts I do.

3. ____ I have thoughts that I cannot stop.

4. ____ There are images that come to mind that I cannot erase.

5. ____ My thoughts frequently return to one idea.

6. ____ I wish I could stop thinking of certain things.

7. ____ Sometimes my mind races so fast I wish I could stop it.

8. ____ I always try to put problems out of my mind.

9. ____ There are thoughts that keep jumping into my head.

10. ____ Sometimes I stay busy just to keep thoughts from intruding on my mind.

11. ____ There are things that I try not to think about.

12. ____ Sometimes I really wish I could stop thinking.

13. ____ I often do things to distract myself from my thoughts.

14. ____ I have thoughts that I try to avoid.

15. ____ There are many thoughts that I have that I don't tell anyone.