

**COGNITIVE PROCESSES IN EXCESSIVE WORRY: A CROSS-CULTURAL
INVESTIGATION OF THREE THEORIES**

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DECLARATION

I declare that this thesis hereby submitted by me for the degree Philosophiae Doctor at the University of the Free State is my own independent work and has not previously been submitted by me at another university/faculty. I furthermore cede copyright of the thesis in favour of the University of the Free State.

Chrisma Pretorius

30 November 2010

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SUMMARY

Research interest in worry has increased over the past three decades. Theory development, laboratory studies and clinical experience have resulted in the formulation of a number of theories and models related to the development and maintenance of excessive worry and generalized anxiety disorder (GAD). The available cognitive behavioural literature on worry seems to place particular emphasis on three models of worry. The avoidance model of worry (AMW) and GAD (Borkovec, Ray & Stöber, 1998), the metacognitive model (MCM) of GAD (Wells, 1995) and the intolerance of uncertainty model (IUM) (Dugas, Gagnon, Ladouceur & Freeston, 1998) have all enjoyed significant empirical attention and have all formed the basis for specific cognitive-behavioural interventions for worry and GAD. However, to date, no attempt appears to have been made to compare these models to one another or to determine the applicability of these particular models of worry to a multi-ethnic context. Therefore, the current study aimed to determine the applicability of these three cognitive models of worry to the understanding of worry in a non-clinical multi-ethnic sample. To this end, a convenience sample of 1224 university students (87.7% undergraduate) was drawn. Ethnicity was equally distributed in the sample (49.9% black and 50.1% Caucasian). However, the majority (709) of the participants were female. Participants were also assigned to one of three groups (low worry: $n = 1105$; high-worry non-GAD: $n = 49$; high-worry GAD: $n = 70$) based on their worry intensity and GAD self-report diagnoses.

Moderated hierarchical regression analyses revealed that gender and worry/GAD status moderated the relationship between the cognitive processes hypothesised to underpin the development and maintenance of worry and worry intensity across all three models of worry, as well as in a model comprised of the cognitive processes relevant to all three individual cognitive models. However, ethnicity was found not to moderate these relationships. Furthermore, hierarchical regression analyses indicated that the three cognitive models of worry, individually and in combination, accounted for a significant proportion of the variance in the worry intensity of the current sample. This finding was evident across gender and worry/GAD status. Thus, the AMW, MCM and IUM, as well as a combination of the three models, appear to be applicable to the understanding of non-clinical worry in the multi-ethnic South African context. Furthermore, when the AWM, MCM and IUM were compared to the combined model of worry, only the AWM was found to account for a significantly lower

proportion of the variance in the worry intensity of the sample than the combined model did. Consequently, although all three models appear to be applicable to the understanding of non-clinical worry in the multi-ethnic context, using a combined model to explain worry intensity appears superior only to the AWM.

With regard to the interaction between specific cognitive processes and worry intensity, only positive beliefs about worry were found to account consistently for a significant proportion of the worry intensity reported by the low-worry, female and male participants. Furthermore, positive beliefs about worry were not found to account for a significant proportion of the variance in the worry intensity of the high-worry participants. Gender-specific trends were evident with respect to positive beliefs about worry in relation to the non-clinical worry reported by the participants, with females generally viewing worry as a source of motivation and men perceiving worry to be a positive personality trait. The current findings also suggest a significant relationship between negative problem orientation and worry intensity among high-worry GAD individuals.

Contrary to most of the existing literature, the current study suggests that negative beliefs about worry, intolerance of uncertainty, negative problem orientation and cognitive avoidance do not significantly contribute to the worry experienced by non-clinical individuals. In addition, negative beliefs about worry, intolerance of uncertainty and cognitive avoidance were not found to contribute significantly to the worry experienced by excessive worriers, irrespective of their self-report GAD diagnostic status.

The current study raises a number of questions regarding the applicability of the three cognitive models of worry and their specific components to the understanding of worry, particularly excessive worry, in the multiethnic South African context. Nonetheless, this study has succeeded in exploring the contribution of cognitive processes to the experience of worry in a specific multi-ethnic context by investigating the applicability of theoretical cognitive models of worry in this context. Furthermore, this study has provided a starting point from which a clearer understanding of the role of cognitive processes in worry can be achieved in the South African context.

Key terms:

worry, generalized anxiety disorder (GAD), avoidance model of worry and GAD, metacognitive model of GAD, intolerance of uncertainty model, gender, ethnicity, positive beliefs about worry, negative problem orientation.

OPSOMMING

Navorsers se belangstelling in bekommernis het oor die laaste drie dekades toegeneem. Teorie-ontwikkeling, laboratoriumstudies en kliniese ervaring het gelei tot die formulering van 'n aantal teorieë en modelle oor die ontwikkeling en instandhouding van oormatige bekommernis en veralgemeende angster (VAV). Dit blyk dat beskikbare literatuur oor kognitiewe gedrag oor bekommernis spesifieke klem plaas op drie modelle van bekommernis. Die vermydingsmodel van bekommernis (VMB) en VAV (Borkovec, Ray & Stöber, 1998), die metakognitiewe model (MKM) van VAV (Wells, 1995) en die intoleransie-vir-onsekerheid-model (IOM) (Dugas, Gagnon, Ladouceur & Freeston, 1998) het almal betekenisvolle empiriese aandag geniet en het almal die basis van spesifieke kognitiewe gedragsintervensies vir bekommernis en VAV gevorm. Dit blyk egter dat geen poging tot op datum aangewend is om hierdie modelle met mekaar te vergelyk of om die toepaslikheid van hierdie spesifieke modelle van bekommernis in 'n multi-etniese konteks te bepaal nie. Die huidige studie se doel was dus om die toepaslikheid van hierdie drie kognitiewe modelle van bekommernis tot die verstaan van bekommernis in 'n nie-kliniese multi-etniese steekproef te bepaal. Vir hierdie doel is 'n gerieflikheidssteekproef van 1224 universiteitstudente (87.7% voorgraads) getrek. Etnisiteit was gelykop in die steekproef versprei (49.9% swart en 50.1% blank). Die meerderheid van die deelnemers (709) was egter vroulik. Deelnemers is ook op grond van die intensiteit van hulle bekommernis en self-gerapporteerde VAV-diagnose in een van drie groepe (lae bekommernis, $n = 1105$; hoë bekommernis nie-VAV, $n = 49$; hoë bekommernis VAV, $n = 70$) ingedeel.

Gemodereerde hiërargiese regressie-analises het aangedui dat geslag en bekommernis/VAV-status die verhouding tussen die kognitiewe prosesse wat gehipotetiseer word om die ontwikkeling en instandhouding van bekommernis te ondersteun en die intensiteit van bekommernis oor al drie modelle van bekommernis, asook in 'n model wat bestaan uit die kognitiewe prosesse wat relevant is tot al drie individuele kognitiewe modelle, modereer. Dit is egter bevind dat etnisiteit nie hierdie verhoudings modereer nie. Hiërargiese regressie-analises het verder aangedui dat die drie kognitiewe modelle van bekommernis, individueel en in kombinasie, 'n beduidende proporsie van die variansie in die intensiteit van bekommernis van die huidige steekproef verklaar. Hierdie bevinding was duidelik oor geslag en bekommernis/VAV-status heen. Dit blyk dus dat die VMB, MKM en IOM, asook 'n

kombinasie van die drie modelle, toepaslik is om nie-kliniese bekommernis in die multi-etniese Suid-Afrikaanse konteks te begryp.

Verder, as die VMB, MKM en IOM met die gekombineerde model van bekommernis vergelyk word, is bevind dat slegs die VMB 'n betekenisvolle laer proporsie van die variansie in die intensiteit van bekommernis as die gekombineerde model verklaar. Die gevolg hiervan is dat, alhoewel dit blyk dat al drie modelle op nie-kliniese bekommernis in die multi-etniese konteks toepaslik is, die gebruik van 'n gekombineerde model om die intensiteit van bekommernis te verduidelik, slegs beter as die VMB blyk te wees.

Met betrekking tot die interaksie tussen spesifieke kognitiewe prosesse en die intensiteit van bekommernis, is bevind dat slegs positiewe oortuigings oor bekommernis konsekwent 'n betekenisvolle proporsie van die intensiteit van bekommernis gerapporteer deur die vroulike en manlike deelnemers met lae bekommernis verklaar. Verder het positiewe oortuigings oor bekommernis nie 'n betekenisvolle proporsie van die variansie in die intensiteit van bekommernis van die deelnemers met hoë bekommernis verklaar nie. Geslag-spesifieke patrone was duidelik met betrekking tot positiewe oortuigings oor bekommernis in verband met die nie-kliniese bekommernis wat deur die deelnemers gerapporteer is, met vroue wat bekommernis in die algemeen as 'n bron van motivering beskou en mans wat bekommernis as 'n positiewe persoonlikheidstrekk beskou. Die huidige bevindinge stel ook 'n betekenisvolle verhouding tussen negatiewe probleemoriëntasie en die intensiteit van bekommernis onder VAV-individue met hoë bekommernis voor.

In teenstelling met die meeste van die bestaande literatuur, stel die huidige studie voor dat negatiewe oortuigings oor bekommernis, intoleransie van onsekerheid, negatiewe probleemoriëntasie en kognitiewe vermyding nie 'n betekenisvolle bydrae lewer tot die bekommernis wat deur nie-kliniese individue ervaar word nie. Verder is ook bevind dat negatiewe oortuigings oor bekommernis, intoleransie van onsekerheid en kognitiewe vermyding nie 'n betekenisvolle bydra gelewer het tot die bekommernis wat ervaar word deur individue wat hulle oormatig bekommer nie, afgesien van hulle diagnostiese VAV-status.

Die huidige studie lig 'n aantal vrae met betrekking tot die toepaslikheid van die drie kognitiewe modelle van bekommernis en hulle spesifieke komponente tot die verstaan van

bekommernis, spesifiek oormatige bekommernis, binne die multi-etniese Suid-Afrikaanse konteks uit. Hierdie studie het nietemin daarin geslaag om die bydrae van kognitiewe prosesse tot die ervaring van bekommernis in 'n spesifieke multi-etniese konteks te verken deur die toepaslikheid van teoretiese kognitiewe modelle van bekommernis in hierdie konteks te ondersoek. Hierdie studie het verder 'n beginpunt voorsien vanwaar duideliker begrip van die rol van kognitiewe prosesse in bekommernis in die Suid-Afrikaanse konteks bereik kan word.

Sleutel terme:

bekommernis, veralgemeende angsvreuring ([VAV], "generalized anxiety disorder"), vermydingsmodel van bekommernis ("avoidance model of worry") en VAV, metakognitiewe model van VAV ("metacognitive model of GAD"), intoleransie-vir-onsekerheid-model ("intolerance of uncertainty model"), geslag, etnisiteit, positiewe oortuigings oor bekommernis, negatiewe probleemoriëntasie

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1 INTRODUCTION

1.1 BACKGROUND

Since the inclusion of excessive worry as the primary diagnostic criterion for generalized anxiety disorder (GAD) in the revised, third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R, American Psychiatric Association [APA], 1987) in 1987, worry has received considerable attention in the literature. Thus, the past three decades have witnessed increased clinical and empirical interest in the subject of worry (Holaway, Rodebaugh & Heimberg, 2006). This interest has been encouraged by the recognition that worry is implicated in a variety of conditions that result in significant psychological distress (Borkovec, Robinson, Prunzinsky, & DePree, 1983; Dugas, Gosselin & Labouceur, 2001; Holeva, Tarrier, & Wells, 2001; Hong, 2007). In turn, increased theoretical and empirical interest in worry has stimulated interest in the mechanisms underlying excessive worry and GAD (Behar, Dobrow DiMarco, Hekler, Mohlman & Staples, 2009). Various models offer perspectives on the causes of excessive worry, the factors that are thought to maintain excessive worry and GAD, as well as the treatment of GAD.

Theory development, laboratory studies and clinical experience over the past two decades have resulted in the formulation of a number of theories and models related to the development and maintenance of excessive worry and GAD. Models and theories highlighting the role of cognition in the development and maintenance of excessive worry, particularly in the context of GAD, appear to dominate theoretical and empirical literature. The burgeoning cognitive behavioural literature on worry seems to place particular emphasis on three models of worry. The first is the avoidance model of worry and GAD proposed by Borkovec and colleagues (Borkovec, Alcaine & Behar, 2004; Borkovec, Ray & Stöber, 1998). This model suggests that worry is a verbal-linguistic, thought-based activity that inhibits mental imagery and its associated somatic and emotional activation. Second, the metacognitive model of GAD proposed by Wells (1995) suggests that people suffering from GAD appear to have both positive and negative beliefs about worry. From the metacognitive perspective, negative metacognitive beliefs about worry are considered to be central to the

development and maintenance of excessive worry, and thus of GAD. Third, Dugas, Gagnon, Ladouceur and Freeston (1998) propose the intolerance of uncertainty model, which underscores the role of four specific cognitive processes in the development and maintenance of worry and GAD: intolerance of uncertainty, negative problem orientation, positive beliefs about worry and cognitive avoidance. Although these models differ to some degree, they share an underlying commonality in their specific focus on cognitive processes in the development and maintenance of excessive worry and GAD.

In addition to the increased focus on specific cognitive processes and mechanisms underlying the development of psychopathology in theoretical and experimental literature, the need to identify and specifically target key maintenance processes in the psychotherapeutic treatment of emotional disorders has also been emphasized (Starcevic & Berle, 2006). Consequently, the identification of worry as the primary form of repetitive thought involved in GAD has been accompanied by increased clinical interest in identifying, understanding and targeting cognitive processes underlying the development and maintenance of excessive worry (Behar et al., 2009). It has been hypothesised that the lack of an empirically supported model of worry and GAD has limited the efficacy of traditional cognitive behavioural approaches to treating GAD (Borkovec & Ruscio, 2001; Chambless & Gillis, 1993; Fisher & Durham, 1999; Newman, Castonguay, Borkovec, Fisher & Nordberg, 2008). The formulation of worry- and GAD-specific cognitive models resulted in the development of treatment approaches specifically targeting worry. At least two (the metacognitive model and the intolerance of uncertainty model) of the cognitive behavioural models of worry and GAD investigated in this study served as bases for the development of cognitive behavioural treatment protocols for GAD. Wells (1997) developed a treatment protocol for GAD that focuses specifically on the metacognitions hypothesised to underlie the maintenance of excessive worry. Dugas and colleagues (Dugas & Koerner, 2005) developed treatment protocols for GAD specifically focussing on addressing intolerance of uncertainty, negative problem orientation, cognitive avoidance and positive beliefs about worry. Available literature on treatment outcomes suggests that both approaches mentioned above are superior to standard cognitive behavioural protocols for GAD with regard to symptom relief at termination of therapy, prevention of relapse and the maintenance of therapeutic gains at follow up (Dugas et al., 2003; Dugas & Koerner, 2005; Dugas & Robichaud, 2007; Wells & King, 2006). The development of specific cognitive models of worry and GAD would thus

appear to have made a noteworthy contribution to the theoretical understanding of the cognitive processes underlying excessive worry and the treatment of excessive worry.

1.2 PROBLEM STATEMENT

The cognitive avoidance model, the metacognitive model and the intolerance of uncertainty model have all been developed in either North America or Europe. Furthermore, most of the experimental and treatment outcome studies that have been conducted with reference to these models have been conducted in the developed western world. However, the applicability of systematic diagnostic systems such as the DSM and ICD across societies and ethnicities has begun to be debated recently (Gureje, Lasebikan, Kola & Makanjuola, 2006; Lewis-Fernández et al., 2010; Williams et al., 2008). Included in this debate is the extent to which the construct of excessive worry can be defined and measured validly across ethnicity. Consequently, the cross-ethnic relevance of theories and models purporting to explain the development and maintenance of excessive worry may also need to be questioned.

Concerns regarding the universality of commonly used diagnostic criteria in psychopathology seem to form part of an increasing socio-cultural sensitivity in the field of therapeutic psychology in general. Various authors highlight the importance of knowledge of ethnic differences in the diagnosis and treatment of people from different ethnic backgrounds (Barlow, 2002; Flaskerud, 2000; Friedman, 2001; Scott, Eng & Heimberg, 2002). The manner in which culture or ethnicity may influence how individuals present with psychological distress and seek help for psychological difficulties has also been emphasised (Eshun & Gurung, 2009; Tanaka-Matsumi, 2001). Similarly, the need for clinicians to consider ethnicity when working with people from cultures other than their own is well-documented (Bernal & Sáez-Santiago, 2006; Sue & Zane, 1987). Moreover, the American Psychological Association (APA) has identified developing and exhibiting ethnic or cultural sensitivity as ethical responsibilities with regard to both clinical practice and psychological research (APA, 2003). However, a review of the relevant literature appears to suggest that, while the importance of developing ethnically and culturally sensitive diagnostic systems and forms of therapy is emphasised frequently, very few studies have attempted to investigate the

cognitive processes commonly purported to underlie emotional disorders across culture or ethnicity.

Available literature would seem to suggest that cognitive models of worry and GAD have advanced understanding with regard to the aetiology and maintenance of excessive worry and GAD. Furthermore, treatment protocols based on these models appear to yield superior outcomes in comparison to traditional cognitive behavioural treatments for excessive worry and GAD. However, given the current debate surrounding the cross-ethnic applicability of excessive worry in the context of GAD, the lack of empirical support for cognitive models of worry and GAD, as well as for the treatment protocols based on these models, needs to be addressed. An exploration of the cross-ethnic or cross-cultural applicability of the avoidance model of worry, the metacognitive model of worry and GAD, and the intolerance of uncertainty model to the understanding of worry would thus seem to be indicated.

In addition to the need to determine the cross-ethnic applicability of the three cognitive models of worry noted previously, there may also be merit in determining the unique contribution that each model makes to the understanding of worry. Despite their focus on unique mechanisms underlying worry, these three models highlight certain common cognitive processes. All three models appear to emphasise the avoidance of internal experiences (Behar et al., 2009; Borkovec et al., 1998; Dugas et al., 1998; Wells, 1995). According to the avoidance model of worry and GAD, worry functions as a cognitive avoidance strategy resulting in the suppression of somatic/physiological responses to threatening or fear-provoking stimuli, while the metacognitive model of GAD highlights the use of strategies to avoid worrying about worry (Borkovec et al., 1998; Wells, 1995). The intolerance of uncertainty model views worry as a strategy employed by individuals to avoid uncertainty (Dugas et al., 1998). All three models also emphasise positive beliefs that people hold with regard to worry. More specifically, all three models emphasise the potential of the perception that worry is useful in either avoiding or adequately preparing for negative outcomes as a potential mechanism through which worry is reinforced and thus maintained (Borkovec et al., 1998; Dugas et al., 1998; Wells, 1995). Thus, it would seem necessary to investigate whether each model makes a unique contribution to the understanding of the cognitive processes underlying worry. Similarly, there would appear to be merit in

determining whether a combination of cognitive processes from the three models provide a better understanding of the maintenance of worry than the three models do independently.

Noteworthy gender differences have been noted in the prevalence of GAD, with women being twice as likely to meet the criteria for the disorder as men are (Bijl, Ravelli, & Van Zessen, 1998; Carter, Wittchen, Pfister, & Kessler, 2001; Wittchen, Zhao, Kessler & Eaton, 1994). Similarly, the few studies that have explored gender differences in worry seem to suggest that women consistently report significantly higher frequencies of worry than men do (Lewinsohn, Gotlib, Lewinsohn, Seeley & Allen, 1998; McCann, Stewin & Short, 1991, Robichaud, Dugas & Conway, 2003). However, there seems to be a paucity of research specifically examining gender differences in cognitive variables related to worry (D’Zilla, Maydeu-Olivares & Kant, 1998; Robichaud et al., 2003). Consequently, the exploration of the avoidance model of worry, the metacognitive models of worry and GAD and the intolerance of uncertainty model across gender appears to be warranted.

1.3 AIM AND OBJECTIVES

The current study aims to determine the applicability of the avoidance model of worry and GAD, the metacognitive model of GAD and the intolerance of uncertainty model to the understanding of the development and maintenance of worry in a multi-ethnic context. In addition, the study aims to determine whether a specific model of worry is superior to the others and/or a combination of all three models in accounting for the intensity of worry experienced by individuals in a multi-ethnic context.

To achieve the aims of the study, the following broad research objectives have been formulated:

1. To determine the amount of variance in worry intensity that is accounted for by each of the three models of worry, as well as by a combination of the components of these models in a non-clinical, multi-ethnic sample.
2. To determine the effect of ethnicity on the amount of variance in worry intensity that is accounted for by each of the models, as well as by a combination of the components of the three models.

3. To determine the effect of gender on the amount of variance in worry intensity that is accounted for by each of the models, as well as by a combination of the components of the three models.

1.4 CHAPTER EXPOSITION

The current chapter (Chapter 1) has provided a brief background to the study and presented the aim and objectives of the research. An overview of the rest of the thesis is also provided.

Chapter 2 provides an overview of contemporary conceptualizations of worry. Worry is defined, and a brief history of the theoretical and empirical understanding of worry is provided. A distinction is drawn between normal worry, excessive worry and excessive worry in the context of GAD. Furthermore, worry is differentiated from other forms of repetitive thought also implicated in emotional disorders, e.g. obsessive thoughts and depressive rumination. Finally, the prevalence of worry and GAD, as well as age, gender and ethnic differences reported with regard to worry and GAD will be reviewed.

Chapter 3 provides a review of the avoidance model of worry and GAD (Borkovec et al., 1998), the metacognitive model of GAD (Wells, 1995) and the intolerance of uncertainty model (Dugas et al., 1998). The chapter focuses on the conceptual components of each model, as well as the available empirical literature relating to each model.

Chapter 4 explores the relevance of race, culture and ethnicity to the understanding of the presentation of emotional distress and psychopathology. An attempt is made to define ethnicity in the context of the current study. An overview of the available literature on anxiety and ethnicity is provided. Finally, available literature pertaining to GAD, worry and ethnicity is reviewed.

Chapter 5 presents the methodology followed in the current study. Initially, the aims of the current research are stated and the research questions formulated. The composition of the sample is then discussed with regard to ethnicity, gender and self-report GAD diagnostic status. The measuring instruments used in the study are reviewed. In addition, the procedures

followed during the translation of the measuring instruments from English into Afrikaans are presented. Internal consistency data for the translated questionnaires and for individuals who did not complete the questionnaires in their home language are discussed. Finally, the statistical procedures used to analyze the data are described.

Chapter 6 conveys the results of the analysis. The chapter begins with an explanation of the procedures used to classify the participants according to worry intensity and GAD status. Next, the results of the moderated hierarchical multiple regression analyses to determine the influence of biographical variables on the relationship between the components of each model of worry, as well as between a combination of the components of all three models, and worry intensity are presented. The correlations between the components of each model, as well as a combination of the components from all three models, and worry intensity are then reported for the total sample, by gender and by GAD/worry status. Furthermore, the results of the hierarchical multiple regression analyses conducted to determine the percentage of variance in worry intensity accounted for by each of the three models, as well as by a combination of the components of all three models, are presented. Finally, the differences in the proportional variance in worry intensity accounted for by each of the three models, as well as by a combination of the components of all three models, are presented.

Chapter 7 discusses the major findings presented in chapter 6. These findings are discussed with reference to available theoretical and empirical literature. Conclusions are drawn based on the discussion of the findings of the study, followed by an exploration of some limitations of the study. Finally, certain practical implications of the findings from the current research are considered, before potential avenues for future research are highlighted.

2 WORRY

2.1 INTRODUCTION

Worry is a universal human experience (Chelminski & Zimmerman, 2003; Wells & Carter, 1999) and provides important subject matter for theory and research because the phenomenon of worry is hypothesised to contribute to most forms of psychological disorders (Wells, 2006). Everybody experiences worry at some time or another in their lives – yet worry appears to become problematic when it is excessive, impairs functioning and contributes to pathology and emotional distress (Chelminski & Zimmerman, 2003; Szabó & Lovibond, 2006).

The past three decades have seen a heightened empirical and clinical interest in the topic of worry (Holaway et al., 2006). This awareness has been encouraged by the acknowledgment that worry is implicated in a variety of conditions that cause psychological distress, for example in anxiety disorders (Borkovec et al., 1998; Brown, Anthony & Barlow, 1992; Dugas et al., 2001; Wells, 1995) and insomnia (Borkovec et al., 1983; Harvey & Greenall, 2003). Worry has also been associated with people's anxiety about their health (Freeston, Dugas, Letarte, & Rheume, 1996), depressive symptoms (Hong, 2007) and post-traumatic stress symptoms (Holeva et al., 2001). Furthermore, the inclusion in 1987 of excessive worry as the primary diagnostic criterion for generalized anxiety disorder (GAD) in the revised, third edition of the Diagnostic and Statistical Manual of Mental Disorders (APA, 1987) sparked greater research interest in worry.

This chapter will first focus on the history and definition of the phenomenon of worry. Thereafter, a distinction will be drawn between normal worry, excessive worry and GAD. Furthermore, excessive worry will be differentiated from obsessive thoughts and depressive rumination. Finally, the prevalence of worry and GAD, as well as age, gender and ethnic differences reported with regard to worry and GAD will be considered.

2.2 HISTORY AND DEFINITION OF WORRY

In the past, worry was viewed as merely a symptom of anxiety and not a particularly noteworthy construct for independent study (Holaway et al., 2006; Purdon & Harrington, 2006). Before the 1980s, worry was considered as the cognitive component of test anxiety and it was found that worry played an important role in predicting poor academic performance (Hembree, 1988; Seipp, 1991). O'Neill (1985) proposed that worry is extinguished through the same mechanisms used to extinguish anxiety, and so does not need to be treated as a separate construct. On the other hand, Borkovec (1985) argued that worry is the cognitive component of anxiety. Consequently, the relationship between anxiety and the physiological and behavioural components of anxiety needs to be understood better. General sentiment in the field of cognitive behavioural psychology would thus appear to be that worry is a specific cognitive construct worthy of research in its own right (Chelminski & Zimmerman, 2003; Covin, Ouimet, Seeds & Dozois, 2008; Purdon & Harrington, 2006). The history of worry as it relates to GAD will now be considered, as the addition of excessive worry as the primary diagnostic criterion for GAD in the DSM-III-R (APA, 1987) appears to have increased theoretical and empirical interest in the phenomenon of worry.

The term GAD first appeared in the DSM-III in 1980 (APA, 1980). The fundamental characteristic of the disorder was stated as anxiety that persisted for at least one month, while symptoms from three of four possible categories, including motor tension, autonomic hyperactivity, apprehensive expectation and vigilance also had to be present (Barlow, 2002; Dugas & Robichaud, 2007). Before 1980, GAD was viewed as a residual disorder because the diagnosis was not made if symptoms of panic disorder, obsessive-compulsive disorder or phobias were present (Barlow, 2002; Dugas & Robichaud, 2007). To address the non-specific nature of the DSM-III diagnostic criteria for GAD, adjustments were made to the definition or understanding of GAD with the 1987 publication of the DSM-III-R (APA, 1987). The most noteworthy modification was the shift from the term *persistent anxiety* to *excessive* or *unrealistic worry* to describe the main feature of GAD. In addition, GAD could now be diagnosed in the presence of another psychological disorder, providing that the worry and anxiety were unrelated to the other condition (Barlow, 2002; Dugas & Robichaud, 2007). In this way, GAD was moved from the status of a residual category to an independent anxiety disorder (Barlow, 2002; Dugas & Robichaud, 2007). Moreover, the minimum duration of

excessive worry and anxiety required for a diagnosis of GAD was extended from one month to a period of at least six months (Barlow, 2002; Dugas & Robichaud, 2007). However, in spite of these changes, the vague somatic criteria remained. Six out of eighteen somatic symptoms were required for individuals to meet the diagnostic criteria for GAD.

The introduction of the DSM-IV in 1994 saw another revision to the diagnostic criteria for GAD (Barlow, 2002; Dugas & Robichaud, 2007). Symptoms were still required to be present more days than not for a minimum of six months. However, the term *unrealistic* was replaced by the criterion that worry was *difficult to control*. These two criteria (i. e. the minimum duration of worry and the difficulty in controlling worry) demonstrate the fundamental nature of GAD as a chronic condition. Consequently, it appeared as though worry related to GAD could be quantitatively distinguished from nonclinical worry (i.e. on the basis of frequency and intensity) rather than purely on the basis of qualitative judgements with regard to how realistic or appropriate the worry appears to be (Dugas & Robichaud, 2007). No further changes to the GAD diagnostic criteria were introduced in the 2000 text revision of the DSM-IV (APA, 2000).

Over the past few years, various models have been proposed in an attempt to provide an explanation of the various factors that play a role in the development and maintenance of GAD. Since excessive worry is considered the defining feature of GAD, any theory or model attempting to explain the development and maintenance of GAD would also need to explain the development and maintenance of worry. The models that have been proposed include:

- the avoidance model of worry and GAD (Borkovec et al., 1998);
- the metacognitive model of GAD (Wells, 1995);
- the intolerance of uncertainty model (Dugas et al., 1998);
- the emotion dysregulation model (Mennin, Heimberg, Turk & Fresco, 2002); and
- the acceptance-based model of GAD (Roemer & Orsillo, 2002).

Behar et al. (2009) conducted a critical review of the above-mentioned contemporary models of GAD. The avoidance of internal experiences seems to be central to all five these models (Behar et al., 2009). For example, the avoidance model of worry and GAD (Borkovec et al., 1998) suggests that individuals use worry to avoid emotion-laden stimuli such as distressing images, whereas the metacognitive model of GAD (Wells, 1995) focuses on how individuals

engage in strategies, such as beliefs about the need to control thoughts, to avoid worrying about worry. The intolerance of uncertainty model (Dugas et al., 1998) proposes that individuals use worry to avoid uncertainty, and the emotion dysregulation model (Mennin et al., 2002) views worry as a strategy that is used by individuals to manage and avoid emotions. Finally, the acceptance-based model of GAD (Roemer & Orsillo, 2002) suggests that individuals use worry to avoid internal experiences they perceive to be threatening. Behar et al. (2009) concluded that, although noteworthy progress has been made in the theoretical understanding of GAD, a need for more research investigating the predicative components of these contemporary models of GAD is evident.

Thus far, it has been established that worry is generally accepted to be an independent phenomenon warranting empirical and theoretical attention. Moreover, the importance of worry as a maintaining mechanism in emotional distress and at least some forms of psychopathology has been established. It now becomes necessary to attempt to reach a clear and appropriate definition of the term *worry*. Among the many definitions of worry that have been formulated, the one by Borkovec et al. (1983) appears to be used most often. These authors define worry as “a chain of thoughts and images, negatively affect-laden and relatively uncontrollable; it 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; consequently, worry relates closely to the fear processes” (Borkovec et al., 1983, p. 10). Borkovec and colleagues also noted that worry frequently manifests as a series of “What if...” self-statements. MacLeod, Williams and Bekerian (1991) propose another definition of worry, suggesting 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 is accompanied by feelings of anxiety” (p. 478). More recent formulations have extended the definition proposed by Borkovec et al. (1983), describing worry as an anxious apprehension of potential, negative events and stating that worry involves primarily verbally based and negatively valenced thought activity, while images play a minimal role (Barlow, 2002; Borkovec et al., 1998; Hoyer, Becker & Roth, 2001). For the purpose of this study, worry will be understood and conceptualised according to the definition suggested by Borkovec et al. (1983), as this definition seems to be most common in theoretical conceptualizations of worry and GAD (Borkovec et al., 1998; Dugas et al., 1998; Wells, 1995). Therefore, in this study, worry will be defined as long chains of

relatively uncontrollable, negative affect-laden thoughts that are predominantly verbal in form and seem to represent an attempt to find solutions for problems whose outcomes are uncertain and potentially negative.

2.3 EXCESSIVE AND NORMAL WORRY

Excessive and uncontrollable worry is considered central to GAD (APA, 2000). Despite the acknowledgement that worry is a universal human experience (Chelminski & Zimmerman, 2003; Wells & Carter, 1999), it is not yet clear how a healthy person's worry is associated with or distinguishable from excessive forms of worry. Traditionally, normal worry and excessive worry have been regarded as distinguishable but related constructs (Craske, Rapee, Jackel & Barlow, 1989; Roemer, Molina & Borkovec, 1997). According to Ruscio (2002), normal worry appears to be regarded as "mild, transient, generally limited in scope, and experienced by the majority of individuals" while excessive worry appears to be "chronic, pervasive, excessive, and experienced only by individuals with GAD" (p. 378). Research has indicated that there are many differences between healthy people with normal worries and excessive worriers. Excessive worriers worry about a greater variety of topics and tend to worry more about minor concerns (Roemer et al., 1997). They also appear to use worry as a strategy to avoid emotional topics (Roemer et al., 1997). Individuals that engage in excessive worry also spend more time worrying than normal worriers do and report that their worry generally occurs without an identifiable precipitant (Craske et al., 1989). Furthermore, excessive worriers tend to interpret ambiguous external information as more threatening when compared to normal worriers (Eysenck, Mogg, May, Richards, & Mathews, 1991). However, it is not clear from these findings whether the difference between normal and excessive worriers reflects differences in the intensity or content of worry. According to Dugas and Robichaud (2007), the DSM-IV diagnostic criterion of "excessive and uncontrollable" worry suggests that the worry experienced by individuals suffering from GAD is similar in content to that experienced by healthy controls. Accordingly, the difference between normal and excessive worry seems to be more a question of the intensity of the worry than the content (Dugas & Robichaud, 2007).

Ruscio, Borkovec and Ruscio (2001) conducted a study to investigate the latent structure of worry by means of two mathematically distinct taxometric procedures. The results of these procedures provide empirical support for the dimensional structure of worry, suggesting that normal and excessive worry represent opposite ends of a continuum rather than separate constructs. Barlow (2002) also suggests that worry could be a normal and adaptive process with the potential of becoming maladaptive and excessive when carried to the extreme. According to Barlow, “the process of worry seems to move along a dimension or continuum from normal to pathological and it is sometimes difficult to draw the boundary” (p. 100). Robichaud et al. (2003) support the dimensionality of worry and reason that everyone experiences worry, yet each to a different degree of severity, with normal worry on the one extreme of the continuum and excessive and uncontrollable worry on the other. To date, most studies on excessive worry have examined individuals suffering from GAD and have rarely examined excessive worry independent of GAD, thus leaving excessive worry occurring outside the context of GAD poorly understood (Ruscio, 2002; Ruscio & Borkovec, 2004).

Ruscio (2002) conducted two studies to examine worry experiences and GAD symptoms in college samples. The first aim of these studies was to determine the proportion of high worriers that fail to meet the DSM-IV diagnostic criteria for GAD. In addition, Ruscio (2002) aimed to compare high worriers with a diagnosis of GAD to high worriers without a diagnosis of GAD in an attempt to identify variables that may differentiate excessive worry from excessive worry specific to GAD. In the first study, only 20% of the people reporting high levels of excessive worry met the diagnostic criteria for GAD (Ruscio, 2002). Follow-up analyses indicated that most of the individuals that reported high levels of worry, did not meet the diagnostic criteria for GAD. These individuals met only 0 – 1 of the four required DSM-IV diagnostic criteria, with chronic/excessive worry and associated distress and impairment best differentiating individuals suffering from GAD from high worriers without GAD. In the second study, individuals suffering from GAD reported greater emotional disturbance, more frequent worry, less control over their worry and greater levels of depression (Ruscio, 2002). In addition, individuals with high levels of worry but without GAD reported many of the same symptoms of GAD as those of people who suffered from GAD. However, the individuals with high levels of worry but without GAD experienced the symptoms of GAD with significantly less severity than did individuals suffering from GAD (Ruscio, 2002). The findings of both studies suggest that most individuals reporting high

levels of worry do not meet the diagnostic criteria for GAD. Ruscio (2002) argues that the characteristics that define excessive worry, namely pervasiveness and uncontrollability, may not be limited to individuals suffering from GAD. What appears to distinguish high worriers suffering from GAD from high worriers without GAD is the severity or degree to which they experience the symptoms of GAD (Ruscio, 2002).

Research indicates that many individuals who report high levels of worry do not qualify for a GAD diagnosis (Ruscio, 2002). This finding raises the question why certain individuals are more severely impaired and distressed by their worrying than others, especially when the intensity of their worry appears to be similar. Ruscio and Borkovec (2004) attempted to address this difficulty by investigating whether individuals with high worry (those suffering from GAD as well as those not suffering from GAD) differ in their actual experiences of worry or their subjective appraisals of such experiences – or both. Their findings indicate that there are large differences in metacognition between highly worried individuals suffering from GAD and highly worried individuals without a diagnosis of GAD. These results suggest that, although the perception of worry as being dangerous and beyond one's control was elevated among the high worriers without a GAD diagnosis, it was significantly more elevated among equally worried individuals suffering from GAD. This may indicate that subjective perceptions of worry could play an important role in GAD and suggests that appraisals of worry as negative or harmful seem to be specific to individuals suffering from GAD. In addition, Roemer et al. (1997) suggested that worry might function as a strategy for avoiding subjects of a more emotional nature among individuals suffering from GAD. Similarly, Holaway, Hambrick and Heimberg (2003) found that individuals suffering from GAD reported their emotions as being more intense and more confusing than high worriers who had not been diagnosed with GAD. These findings appear to suggest that the distinction between highly worried individuals without a GAD diagnosis and highly worried individuals suffering from GAD may be influenced by perceptions and processes beyond the content, intensity and chronicity of worry (e.g. different appraisals about worry, increased emotional dysregulation).

The danger of viewing worry exclusively in the context of GAD is further highlighted by a growing body of research literature linking worry to psychopathologies other than GAD. Excessive worry has been implicated in social phobia, panic disorder, obsessive-compulsive

disorder (OCD) and social anxiety disorder (Gladstone et al., 2005; Hoyer et al., 2001; Starcevic et al., 2007). Studies comparing the role of excessive worry in GAD and the role of excessive worry in other psychological disorders have produced conflicting findings (Starcevic & Berle, 2006). Some research suggests that people with GAD report their worry as being more excessive and more uncontrollable when compared to individuals suffering from social phobia (Hoyer et al., 2001). On the other hand, a study conducted by Gladstone et al. (2005) suggests that there is no difference in the intensity of worry among people diagnosed with GAD, panic disorder and OCD. Another study suggests that GAD sufferers do not report their worries to be more uncontrollable than those of individuals with other anxiety disorders (Becker, Goodwin, Holting, Hoyer & Margraf, 2003). A study conducted by Starcevic et al. (2007) provides further proof that excessive worry may not be specific to GAD, but that it also seems to play an important role in social anxiety disorder. It would thus seem that excessive worry is not limited to GAD alone, and may also be associated with a variety of other anxiety disorders.

In conclusion, normal and excessive worry have traditionally been treated as two distinct constructs (Craske et al., 1989; Roemer et al., 1997). However, as suggested above, recent evidence supports a more dimensional conceptualization of worry in that all individuals experience worry in differing degrees of severity, with normal worry on the one extreme of the continuum and excessive and uncontrollable worry on the other (Robichaud et al., 2003; Ruscio et al., 2001). Moreover, Ruscio (2002) demonstrated that highly worried individuals that do not meet the diagnostic criteria for GAD also seem to report their worry to be excessive and uncontrollable. This finding suggests that excessive worry may not be limited to individuals suffering from GAD. From literature reviewed, it appears that factors like different appraisals about worry or emotional dysregulation might play an important role in distinguishing highly worried individuals suffering from GAD from highly worried individuals who do not meet the criteria for a diagnosis of GAD. These findings highlight the need for future studies to distinguish the nature of worry in GAD from that of excessive worry outside the context of GAD.

2.4 DIFFERENTIATING WORRY FROM OBSESSIONS AND RUMINATION

Similarities between excessive worry, obsessive thoughts and depressive rumination may raise questions regarding the uniqueness of excessive worry as a construct. Both worry and obsessions are recurring, unwanted and relatively uncontrollable thoughts (Langlois, Freeston & Ladouceur, 2000b). Worry and depressive rumination also appear to share some similarities, which may include repetitive and prolonged thinking, which in turn tends to inhibit problem-solving (Starcevic & Berle, 2006).

Worry is the central feature of GAD, and obsessions are the central characteristic of OCD (DSM-IV-R, APA, 2000). Various similarities between worry and obsessions exist, including repetitive cognitive intrusions and difficulty in dismissing the intrusion (Langlois, Freeston & Ladouceur, 2000a). Important differences between worry and obsessions have been identified, however. For example, worry is experienced frequently in verbal form, in contrast with obsessions that are more often perceived in the form of images (Langlois et al., 2000a). Worry is also more often triggered by specific events (Langlois et al., 2000a). According to Langlois et al. (2000a), one of the most important differences between worry and obsessions relates to their content. Worries are generally egosyntonic and focus on everyday activities (e.g. work, health, finances), whereas obsessions are more distressing, egodystonic, and are inclined to be limited in focus (e.g. contamination, religion, order). This classification suggests that worry and obsessions are two distinct concepts, despite sharing a number of similarities. Langlois, Freeston and Ladouceur (2000b) suggest that obsessions and worries may be viewed as if on a continuum, with egodystonic “pure obsessions” on the one extreme, and egosyntonic “pure worries” on the other extreme, with “mixed forms” in the middle (i.e. obsessions with some basis in reality and worries with some egodystonic features). This conceptualisation appears to take the frequent overlap between worries and obsessions into account (Langlois et al., 2000b).

Although the tendency to engage in recurrent negative thinking about past stressful events, current difficulties and anticipated future problems is a common psychological feature of a variety of disorders, worry and rumination are regarded as core cognitive processes in GAD and major depressive disorder respectively (Papageorgiou, 2006). Similarities between worry

and rumination raise questions about the uniqueness of worry as a construct. Worry and rumination both involve repetitive and prolonged thinking, which tends to inhibit problem-solving (Starcevic & Berle, 2006). Important differences between worry and rumination have been identified, however. Research suggests that the main difference between worry and rumination may lie in content and time orientation. Worry involves a wider range of themes and is generally future oriented, whereas depressive rumination usually involves a narrower range of themes, and focuses on the past (Starcevic & Berle, 2006).

Papageorgiou and Wells (1999a) compared the process and meta-cognitive dimensions of naturally occurring ruminative thoughts and worrisome thoughts in a non-clinical sample. Their findings suggested that worry involves more verbal content, is more strongly associated with a compulsion to act, and involves greater effort and confidence in problem solving when compared to rumination (Papageorgiou & Wells, 1999a). In a subsequent study, Papageorgiou and Wells (1999b) examined the differences between rumination in individuals diagnosed with depression and worry in individuals with panic disorder. Their findings propose that the rumination experienced by the depressed group was considerably longer in duration, less controllable and less dismissible compared to the worry experienced by the panic disorder group. The rumination of the depressed group was also associated with less effort to solve problems, lower confidence in problem-solving, and a stronger orientation toward the past (Papageorgiou & Wells, 1999b). The most significant differences between worry and rumination were related to problem-solving efforts, confidence in problem-solving and past orientation (Papageorgiou & Wells, 1999b).

It is evident from literature reviewed that excessive worry, obsessions and rumination are common cognitive processes in GAD, OCD and depression, respectively. Although excessive worry, obsessions and rumination appear to share many similarities, important differences can also be identified. The differences that have been identified between excessive worry, obsessions and rumination further support the notion that worry is a unique cognitive construct worthy of research in its own right.

2.5 THE EPIDEMIOLOGY OF WORRY AND GAD

2.5.1 The prevalence of worry and GAD

Given that excessive worry is the core feature of GAD, a review of the prevalence of worry cannot exclude the consideration of the prevalence of GAD. It should be noted that prevalence rates for GAD vary widely due to the use of varying research methodologies and significant changes in the DSM diagnostic criteria of GAD over time. The one-year prevalence rate for GAD appears to range from 1.4% to 5.1% (Carter et al., 2001; Hunt, Issakidis & Andrews, 2002; Wang, Berglund, & Kessler, 2000; Wittchen et al., 1994; Williams et al., 2008). While the lifetime prevalence rate for GAD is reported to range from 4% to 7% (Kessler et al., 2005; Wittchen et al., 1994). The National Comorbidity Survey-Replication [NCS-R] is a representative survey of English-speaking household residents aged 18 years and older in the United States (Kessler et al., 2005). NCS-R findings suggest that the lifetime prevalence for GAD is 5.7% (Kessler et al., 2005). Furthermore, the NCS-R reports an increase in the lifetime prevalence of GAD from young adulthood (4.1%) to middle adulthood (6.8-7.7%). However, Kessler et al. (2005) have noted a decline in the prevalence of GAD (3.6%) in individuals over the age of 60.

Literature on the prevalence of excessive worry, unlike that of GAD, appears to be limited. The only available literature in this regard suggests that the prevalence of worry may vary as a function of age, with older adults reporting fewer worries than younger adults (Brenes, 2006; Hunt, Wisocki & Yanko, 2003; Lindesay et al., 2006; Olatunji, Schottenbauer, Rodriquez, Glass, & Arnkoff, 2007).

2.5.2 Lifespan differences in worry and GAD

The typical age of onset for GAD is early, usually during adolescence, and many people with the disorder report having been anxious for as long as they can remember (Wittchen & Hoyer, 2001). Various studies suggest age differences with regard to the content and frequency of worry (Brenes, 2006; Diefenbach, Stanley & Beck, 2001; Hunt et al., 2003).

Literature reviewed suggests that older adults tend to report lower levels of worry than young adults (Brenes, 2006; Hunt et al., 2003; Lindsay et al., 2006; Olantuji et al., 2007). It has also been suggested that the prevalence of worry appears to decrease with age (Hunt et al., 2003; Lindsay et al., 2006). In general, literature seems to suggest that the relationship between worry and lifespan development decreases with age, with older adults reporting lower levels of worry than young adults do. Again, a possible explanation for the reported lower levels of worry among the elderly in comparison to younger adults, may be that these individuals report and focus more on the somatic experiences of anxiety and to a lesser extent on the cognitive elements (i.e. worry) of anxiety (Lindsay et al., 2006; Stanley & Novy, 2000).

Differences in the content of the worries reported by the general population seem to be related to a number of variables such as age, gender, marital status and the level of education (Lindsay et al., 2006). For example, work-related, social and interpersonal worry seems to be more prominent among younger individuals (Ladouceur, Freeston, Fournier, Dugas & Doucet, 2002), whereas elderly people seem to worry more about their health and how to remain functional and independent (Diefenbach et al., 2001; Kogan & Edelstein, 2004; Montorio, Nuevo, Marquez, Izal, & Losada, 2003). These differences in worry content appear to represent developmentally related changes in life circumstances.

2.5.3 Gender differences in worry and GAD

Various studies have found GAD to be twice as prevalent among women as among men (Bijl et al., 1998; Carter et al., 2001; Wittchen et al., 1994). However, a limited number of studies have been conducted on gender differences in worry. Most studies on worry tend to categorise participants as either excessive or normal worriers, and generally disregard gender differences in worry, or only mention them with regard to the demographics of the sample (Robichaud et al., 2003). Nevertheless, among the few studies that have focused on the relationship between worry and gender, the findings have consistently been that women tend to worry significantly more than men do (Lewinsohn et al., 1998; McCann et al., 1991, Robichaud et al., 2003). Although a study conducted by Olatunji et al. (2007) did not examine gender differences in worry directly, the findings demonstrate that the total scores among women on the Penn State Worry Questionnaire (PSWQ) were significantly higher

than those for the men. In addition, the female participants reported their worry to be more excessive, and more uncontrollable than that of the male participants (Olatunji et al., 2007).

Only two studies that specifically examined gender differences in cognitive variables related to worry could be found. D’Zilla et al. (1998) examined gender differences in social problem-solving ability. The findings of their study show that women tend to be more negatively oriented towards their problems than men are (D’Zilla et al., 1998). Robichaud et al. (2003) conducted a study ($n = 317$, of which 217 were female) to investigate whether gender differences exist with regard to intolerance of uncertainty, negative problem orientation, positive beliefs about worry and cognitive avoidance. The findings of this study demonstrate that women tend to report significantly higher levels of worry intensity than men do. Robichaud et al. (2003) also found that women reported that they were more negatively oriented towards problems and engage in more thought suppression. On the other hand, the male participants reported significantly more positive beliefs about worry. The authors maintain that a possible explanation for this might be that men view worry as a helpful method of problem-solving and consequently many have a more positive attitude towards their worry. Thus, taken together, the studies conducted by D’Zilla et al. (1998) and Robichaud et al. (2003) appear to suggest that gender differences may exist with regard to cognitive variables related to worry. It should be noted, however, that the limited research available on gender differences in worry and the cognitive variables related to worry make it impossible to draw definite conclusions in this regard at present.

2.5.4 Ethnic and cultural differences in worry and GAD

Several researchers have highlighted the importance of acquiring knowledge of ethnic differences with regard to the diagnosis and treatment of individuals from different racial and cultural backgrounds (Barlow, 2002; Flaskerud, 2000; Friedman, 2001; Scott et al., 2002). In addition, various researchers have emphasised the importance of concepts such as race, culture and ethnicity in psychopathology (Bernal & Castro, 1994; Okazaki, 1997). In spite of the emphasis placed on ethnic differences, it appears that literature in this field is limited.

Prevalence rates of GAD seem to be similar in several countries worldwide. For example, in Lesotho, the prevalence of GAD and panic disorder are similar to the prevalence of these

disorders in North America (Hollifield, Katon, Spain & Pule, 1990). Furthermore, the prevalence of GAD seems to be similar in America (Wang et al., 2000), Germany (Carter et al., 2001) and Australia (Hunt et al., 2002). Maier et al. (2000) found GAD to be a prevalent psychological disorder in a large study conducted in 14 different countries (Turkey, India, Germany, the Netherlands, France, Greece, Nigeria, the United Kingdom, Japan, Brazil, Chile, the United States of America, China and Italy). Yet, according to Rego (2009), to date, only a few studies have attempted to explore ethnic differences in the prevalence of GAD.

Notwithstanding the apparent worldwide prevalence of GAD, the apparent lack of cross-cultural research in this regard is of concern, particularly because, according to the DSM-IV-TR (APA, 2000), it is important to note that there is considerable variation with regard to ethnicity in the expression of anxiety, because in some ethnic groups anxiety is expressed predominantly through somatic symptoms, while in others it is expressed predominantly through cognitive symptoms. The DSM-IV-TR also suggests that it is important to consider an individuals' ethnicity when determining whether worries about a certain situation are excessive or not (APA, 2000).

Similar to research on GAD, the available literature on worry appears to lack a noteworthy cross-cultural or multi-ethnic focus. Carter et al. (2005) state that most of the research on worry is based on Caucasian samples and that there is a paucity of research on worry among individuals from other ethnic backgrounds. Furthermore, numerous authors have suggested that considerably more research is needed regarding the nature of worry across ethnicities (Roemer, Orsillo & Barlow, 2002; Scott et al., 2002). However, a handful of studies have attempted to determine whether ethnicity-specific or culture-specific experiences of worry occur (Diaz, 2000; Gillis, Haaga & Ford, 1995; Scott et al., 2002; Watari & Brodbeck, 2000). Studies by Gillis et al. (1995), as well as by Scott et al. (2002), revealed no statistically significant differences with regard to the frequency and intensity of worry across ethnicity in nonclinical samples. However, ethnic differences in the content of worry were evident in a study conducted by Scott et al. (2002), with African-American participants reporting significantly less worry regarding relationship stability, self-confidence, future aims and work incompetence than Caucasian and Asian-American participants did. Further, whereas Caucasian and Asian-American participants reported similar frequencies of worry across

domains, African-American participants most frequently reported worrying about financial issues (Scott et al., 2002).

2.6 CONCLUSION

Everybody experiences worry at some time or another in their lives – yet worry only appears to become problematic when it is excessive and impairs functioning. For the purposes of this study, worry will be conceptualized as a long chain of relatively uncontrollable, negative affect-laden thoughts that are predominantly verbal in form and that seem to represent an attempt to find solutions for problems of which the outcomes are uncertain and potentially negative. This definition of worry appears to be most commonly cited in literature about worry and GAD (Borkovec et al., 1998; Dugas et al., 1998; Wells, 1995). Literature reviewed suggests that excessive worry is a cognitive construct that contributes significantly to emotional distress. Moreover, excessive worry can also be differentiated from obsessions and depressive rumination and is viewed as a specific cognitive construct worthy of research in its own right.

Two distinct conceptualizations of worry appear prevalent in literature. The first hypothesis views normal worry and excessive worry as two separate constructs, while others appear to support the dimensionality of worry, with normal worry on the one extreme of the continuum and excessive and uncontrollable worry on the other. Excessive worry is the defining characteristic of GAD, but appears to play a role in several anxiety disorders, suggesting that excessive worry might not be specific to GAD. Moreover, research has demonstrated that individuals with a high level of worry that do not meet the diagnostic criteria for GAD also report their worry as being excessive and uncontrollable. This finding underlines the suggestion that excessive worry might not be limited to individuals suffering from GAD. Furthermore, it seems apparent from the literature that appraisals of worry or emotional dysregulation might play an important role in distinguishing highly worried individuals suffering from GAD from highly worried individuals not meeting the full diagnostic criteria for GAD.

It should be noted that, although the past three decades have witnessed increased clinical and empirical interest in worry, a lack of research is evident, specifically with regard to the role of gender and ethnicity in worry. Nevertheless, among the few studies that have focused on the relationship between worry and gender, the findings consistently suggest that women tend to worry significantly more than men do. However, some studies do seem to suggest that gender differences may influence the relationship of certain cognitive variables to worry. With regard to ethnicity, some studies appear to suggest no significant differences with regard to the frequency and intensity of worry, whereas some suggestions of ethnic differences in the content of worry appear evident. Literature reviewed consistently highlighted a paucity of research on the role of gender and ethnicity in worry; thus warranting future research in related areas.

3 COGNITIVE MODELS OF WORRY

3.1 INTRODUCTION

The increased theoretical and empirical interest in worry discussed in the previous chapter has led to increased interest in the mechanisms underlying excessive worry and GAD (Behar et al., 2009). Various models have been proposed to explain the causes of excessive worry, the factors that maintain GAD, and the treatment of GAD. The focus of some of these models is on the effect of emotions and behaviour on the development of worry and GAD, while other models focus on the function of cognitive processes in the development of worry and GAD. Since the focus of this study is on cognitive processes in excessive worry, only contemporary models of GAD highlighting the role of cognitive processes will be reviewed.

Three models of worry will be reviewed in this chapter, starting with the avoidance model of worry and GAD proposed by Borkovec and colleagues (Borkovec et al., 1998; Borkovec et al., 2004). This model suggests that worry is a verbal-linguistic, thought-based activity that inhibits mental imagery and its associated somatic and emotional activation. From a different perspective, Wells (1995) proposed the metacognitive model of GAD, which suggests that people suffering from GAD appear to have both positive and negative beliefs about worry. In this model, negative metacognitive beliefs in particular appear to be a central element in the development and maintenance of GAD. Thirdly, Dugas et al. (1998) proposed the intolerance of uncertainty model, which underscores the role of intolerance of uncertainty in the development and maintenance of GAD. According to Dugas et al. (1998), people suffering from GAD find unpredictable situations to be particularly stressful and experience excessive worry in response to such situations. A review of the primary conceptual components of each model will form the basis of this chapter. Empirical literature relating to each model will also be reviewed.

3.2 THE AVOIDANCE MODEL OF WORRY AND GAD

3.2.1 Introduction

Cognitive avoidance seems to play an important role in the development and maintenance of anxiety disorders (Purdon, 1999), specifically in GAD (Borkovec et al., 1998). Moreover, it has been suggested that cognitive avoidance is specifically linked to worry (Dugas, Marchand & Ladouceur, 2005). Borkovec and colleagues (Borkovec et al., 1998; Borkovec et al., 2004) proposed the avoidance model of worry and GAD. This model suggests that worry acts as a form of cognitive avoidance to reduce the somatic and emotional activation associated with threatening mental images. Thus, worry serves as an avoidance response that interferes with functional emotional processing by preventing the full experience of anxiety and fear (Borkovec et al., 1998).

3.2.2 The avoidance model of worry and GAD

The avoidance model of worry and GAD (Borkovec et al., 1998) suggests that worry fulfils several avoidant functions. Firstly, worry is viewed as a form of cognitive avoidance that inhibits threatening mental images and suppresses associated somatic and emotional activation. Secondly, by worrying, individuals may feel that they are better able to predict future negative outcomes and are thus better able to take action to prevent them from happening, or at least be adequately prepared to avoid them. In addition, Borkovec et al. (1998) propose that individuals suffering from GAD may worry about relatively superficial concerns to avoid worrying about topics such as past traumatic events that they may find to be too distressing.

To date, Borkovec and colleagues (Borkovec et al., 1998; Borkovec et al., 2004) have not produced a visual representation of the avoidance model of worry and GAD. However, Behar et al. (2009) published a graphic representation of the model, which they claim has been approved by Borkovec. The key elements of the avoidance model of worry and GAD are illustrated in *Figure 1*.

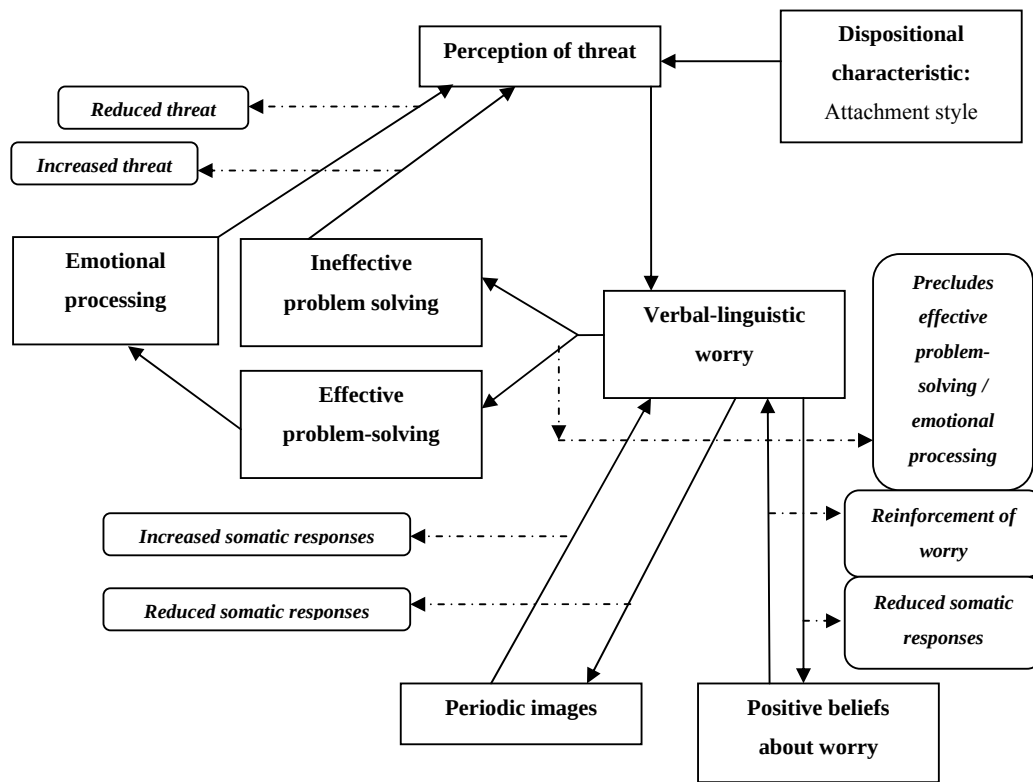


Figure 1. The avoidance model of worry and GAD (Reproduced from Behar et al., 2009, p. 13)

The avoidance model of worry and GAD (Borkovec et al., 1998; Borkovec et al., 2004; Sibrava & Borkovec, 2006) suggests that the perception of threat can be viewed as the trigger for worry (*perception of threat* in Figure 1). The model suggests that, when an individual perceives a threat, he or she naturally attempts to engage some form of activity aimed at avoiding the perceived threat. According to Sibrava and Borkovec (2006), worry can be viewed as an activity undertaken to avoid a perceived threat. More specifically, the avoidance model of worry and GAD suggests that worry (*verbal-linguistic worry* in Figure 1) acts as a form of cognitive avoidance inhibiting threatening mental images (*periodic images* in Figure 1) and thus reduces the somatic and emotional activation (*reduced somatic response* in Figure 1) associated with the perceived threat. Thus, worry serves as an avoidance response that interferes with functional emotional processing of fear, thus preventing the extinction of the fear, and in doing so perpetuates or maintains the fear (*increased threat* in Figure 1). Thus, the avoidance model of worry and GAD proposes that the primarily abstract, verbal-linguistic nature of worry provides a basis for the emotional inhibitory functions of worry.

The implementation of avoidance strategies (such as worry) may prove useful in providing short-term relief from somatic and emotional arousal related to threatening mental imagery (*reduced somatic responses* in *Figure 1*). However, continuous implementation of avoidance strategies eventually becomes a barrier to effective emotional processing (*precludes effective problem solving* and *emotional processing* in *Figure 1*). Thus, worry can be viewed as an ineffective cognitive strategy for providing functional long-term relief from fear, since continuously engaging in worry in reaction to threatening mental imagery prevents effective problem-solving (*effective problem solving* in *Figure 1*). In addition, worry suppresses the somatic and emotional experiences that would naturally occur during the process of confronting fear (*emotional processing* in *Figure 1*) and are hypothesised to result in reduced fear in response to the threatening stimulus (*reduced threat* in *Figure 1*). Put differently, according to the avoidance model of worry and GAD, worry functions to replace threatening mental imagery with less distressing, less somatically activating verbal-linguistic activity. This results in a short-term reduction of fear, which in turn reinforces the suppression of somatic and emotional reactions to anxiety-provoking material, which perpetuates the use of worry as a cognitive strategy for dealing with threatening mental imagery.

Borkovec et al. (1998) propose that worry operates as a strategy for avoiding or adequately preparing for anticipated negative future events or outcomes. Individuals may thus come to consider worry as an effective means of avoiding or coping with anticipated negative outcomes. Consequently, individuals may come to perceive worry as fulfilling a positive function (*positive beliefs about worry* in *Figure 1*). Positive beliefs about worry may include the belief that worry facilitates problem-solving, the belief that worry encourages performance and the belief that worry is vital to avoiding future negative outcomes. In addition, many of the negative outcomes that people worry about never occur or seldom result in the catastrophic consequences they were initially anticipated to bring about. However, when the non-occurrence of these anticipated events is attributed to the apparently positive effects of worry, the perceived efficacy of worry as a self-preservation strategy is reinforced (*reinforcement of worry* in *Figure 1*).

Borkovec and colleagues (Borkovec et al., 1998; Borkovec et al., 2004; Sibrava & Borkovec, 2006) also hypothesize that worry may function as a cognitive strategy for avoiding more emotional topics. In particular, people suffering from GAD, appear to worry about relatively

minor issues (consisting of miscellaneous worries about routine issues) to distract themselves from more distressing emotional topics, such as past traumatic events and negative childhood experiences (*dispositional characteristic* in *Figure 1*).

3.2.3 Empirical support for the avoidance model of worry and GAD

In this section, the empirical literature regarding the avoidance model of worry and GAD will be reviewed, with particular emphasis on the following four central elements of the model:

- Predominance of thought activity in worry.
- The role of worry in the suppression of somatic responses.
- Worry as an attempt to avoid anticipated negative outcomes.
- Worry as a strategy for distraction from distressing emotional topics.

3.2.3.1 Predominance of thought activity in worry

The avoidance model of worry and GAD states that worry entails a "predominance of negatively valenced verbal thought activity" (Borkovec et al., 1998, p. 562). Furthermore, worry involves negative thoughts that usually consist of the fear of what might happen in the future. Imagery is thought to play a less important role in worry. In fact, several studies suggest that worry primarily involves verbally based thought activity, as opposed to imagery-based thought activity (Behar, Zullig, Borkovec, 2005; Borkovec & Inz, 1990; Freeston, Dugas & Ladouceur, 1996; McLaughlin, Borkovec & Sibrava, 2007).

Borkovec and Inz (1990) compared the frequency of thoughts and images reported by people suffering from GAD with those of healthy controls during both self-relaxation and worry induction periods. They found that participants suffering from GAD reported equal numbers of negative thoughts and negative images in the relaxed condition, while the controls generally reported a predominance of imagery during relaxation. However, in the induced worry condition, both participants suffering from GAD and controls reported predominantly negative thoughts rather than negative images. It is important to note that, after effective therapeutic intervention, the thought/imagery ratios of the individuals suffering from GAD were no longer significantly different from those of healthy controls (Borkovec & Inz, 1990).

The Borkovec and Inz (1990) study appears to suggest that worry in GAD is predominantly thought-based rather than imagery-based.

Freeston et al. (1996) conducted a study to replicate and extend the Borkovec and Inz (1990) study discussed above, which suggests that worry is primarily verbal-linguistic in nature. In the study by Freeston et al. (1996), 502 participants completed questionnaires that assessed variables related to diagnostic criteria for GAD and worry intensity. The participants were also required to indicate the percentage of thoughts and images they experienced while worrying. The participants in this study were classified as either excessive worriers (individuals who reported worrying excessively about two or more topics, more days than not for a minimum of six months) or ordinary worriers (participants not meeting the aforementioned criteria). The findings showed that worry was reported as primarily consisting of thoughts rather than images by both groups. In addition, excessive worriers reported higher thought-to-image ratios than participants who were classified as ordinary worriers. This finding tends to suggest that excessive worry, even outside the context of GAD, appears to be a predominantly verbal-linguistic process.

3.2.3.2 Worry and the suppression of somatic responses

The avoidance model of worry and GAD proposes that the primarily abstract, verbal-linguistic nature of worry (Borkovec & Inz, 1990; Freeston et al., 1996) provides a basis for the emotion-inhibitory functions of worry (Borkovec et al., 2004; Borkovec & Inz, 1990; Laguna, Ham, Hope & Bell, 2004). Vrana, Cathbart and Lang (1986) have demonstrated that greater increases in cardiovascular response occur because of imagining (imagery) a threatening situation than as a result of thinking (predominantly verbal thought) about the same situation. Consequently, these authors conclude that imagining a threatening event leads to a more salient somatic fear response than merely thinking about the same event does. From the perspective of the avoidance model of worry and GAD, it has been suggested that reduced somatic and physiological arousal associated with worrying about, rather than imagining, a threatening event can be ascribed to the verbal-linguistic nature of worry. Consequently, worry may be employed as a means of suppressing fear-related somatic responses. Replacing threatening or distressing mental images with verbal linguistic activity (worry) related to the threat results in a reduced somatic or physiological response to the threat. The resulting

reduction in the physiological experience of fear increases the likelihood of worry being employed in the future as a means of coping with distressing or threatening imagery (Borkovec et al., 1998; Borkovec et al., 2004).

Borkovec and Hu (1990) also investigated the effect of worry on fear-related increases in heart rate. In this study, speech-anxious individuals were randomly assigned to one of three conditions (relaxation, neutral thinking or worried thinking). Participants in all three conditions were instructed to imagine themselves making a speech to a large audience in an auditorium. They were instructed to imagine the audience looking expectantly at them while they made the speech. In addition, the participants were instructed to imagine themselves experiencing the physiological symptoms of anxiety (e.g. feeling unsteady on their legs, having a dry mouth and throat). Participants' heart rates were then monitored across ten trials of exposure to the imaginary public speaking scenario. Participants also rated the level of subjective fear they experienced during each of the ten exposures. It was found that participants assigned to the worried thinking condition consistently registered smaller increases in heart rate than individuals assigned to the neutral thought condition, while those assigned to the neutral thought condition demonstrated lower heart rate elevations than individuals in the relaxed condition. However, despite registering the lowest increases in heart rate, participants assigned to the worried thinking condition reported the highest levels of subjective fear of all three groups, followed by participants in the relaxed condition. The participants assigned to the neutral thought condition reported the lowest levels of subjective fear across the ten exposure trials. Thus, the speech-anxious individuals who engaged in worry exhibited lower levels of physiological reaction to the threat stimulus (imagined public speaking and audience scrutiny) than the other participants did, despite reporting the higher levels of subjective fear than the other two groups. This finding appears to support the hypothesis that worry may function as a cognitive avoidance strategy in anxious individuals by preventing effective emotional processing of fear-provoking events while simultaneously reducing the physiological arousal associated with such events.

Hazlett-Stevens and Borkovec (2001) were interested to determine whether worry would suppress fear-related somatic responses in a real-life situation to the same extent that it appeared to do during visualisation tasks. They hypothesized that, as worry appeared to impair effective emotional processing of threatening stimuli by preventing the activation of

the full fear structure (a state thought to be necessary to prevent reinforcement of fear and avoidance) in laboratory tasks, having participants engage in worry prior to engaging in an actual threatening situation would result in similar reductions in emotional processing. To test this hypothesis, Hazlett-Stevens and Borkovec (2001) randomly assigned speech-phobic participants to one of three induction conditions (progressive muscle relaxation, neutral control procedure, or worry). Participants engaged in their specifically assigned induction activity prior to being informed about the topic of the speech they would be required to give. At the same time, the participants were also informed that they had one minute to prepare their speech and that the speech would be videotaped for later evaluation. Once the one-minute preparation time had elapsed, the participants were instructed to face the video camera and commence their speech. Each participant was required to complete five trials of induction and exposure to the speech situation. Measures of cardiovascular activity, as well as subjective ratings of fear were collected for each participant across all five trials. In all three conditions (progressive muscle relaxation, neutral control procedure and worry), individuals displayed strong and equivalent cardiovascular responses to the first speech presentation. All participants also showed similar decreases in heart rate across the repeated presentations, irrespective of the induction condition to which they had been assigned. However, the participants' subjective ratings of fear appeared to vary as a function of the induction condition to which they had been assigned. Individuals assigned to the worry condition exhibited an increase in subjective fear across repeated exposure to the speech task. Individuals assigned to the relaxation condition exhibited a decrease in subjective fear across exposures, and those assigned to the neutral condition exhibited no change in their subjective rating of fear across exposure trials. Thus, it appears that in real-life situations, similar to laboratory studies, worry results in an increase in the subjective experience of fear. However, the reductions in the physiological reactions to fear that seem apparent as a function of worry in the laboratory do not appear evident in this real-life setting. Consequently, the role of worry in the suppression of somatic responses does not appear to be fully understood yet.

The studies reviewed in this section suggest that worry is a form of cognitive avoidance that suppresses somatic/physiological responses to threatening stimuli, but does so at the expense of effective emotional processing. However, it should be noted that, at present, laboratory findings in this regard have not yet been replicated in more ecologically valid settings.

3.2.3.3 Worry as an attempt to avoid anticipated negative outcomes

It has been proposed that worry may serve to reassure an individual that he/she will be able to avoid, or at least be adequately prepared for, future negative outcomes (Borkovec et al., 2004). Thus, individuals may come to consider worry as an effective means of preparing for or coping with anticipated negative outcomes (Freeston, Rhéaume, Letarte, Dugas & Ladouceur, 1994; Wells, 1995; Wells, 2004). Perceptions like these form the basis of positive beliefs about worry that have been implicated in the maintenance of worry because of its perceived efficacy as a coping strategy (Borkovec et al., 1998; Wells, 1995; Wells, 2004).

Borkovec and Roemer (1995) conducted a study aimed at determining whether the perceptions that individuals diagnosed with GAD hold regarding the functions of their worry differ from those held by controls. All participants completed a self-report measure of GAD (on the basis of which they were assigned to either a GAD group or control group), as well as the *Reasons to Worry Questionnaire*. This questionnaire samples the following six possible reasons to worry: motivation to get tasks done; planning ways to avoid negative events; preparation for the worst; problem-solving; superstitious effects on the perceived likelihood of future events; and distraction from more emotional thoughts. Participants most frequently perceived the positive effects of their worry to be motivating them to complete tasks, helping them be prepared for the worst and assisting them in avoiding or preventing negative outcomes. These perceptions were shared by both those meeting the self-report criteria for GAD and the participants that did not (controls). However, GAD participants exhibited a significantly stronger belief in worry as an effective or desirable means of distracting themselves from more emotionally distressing thoughts (Borkovec & Roemer, 1995).

The findings from the study conducted by Borkovec and Roemer (1995) suggest that individuals generally tend to view worry as a source of motivation and a means of avoiding, or at least being prepared for, catastrophe. However, Borkovec Hazlett-Stevens and Diaz (1999), note that the negative outcomes that people worry about seldom occur, and if they do occur, they tend not be as catastrophic as they were initially anticipated to be. Yet, because positive beliefs about worry reinforce avoidant behaviour, many individuals never have the opportunity to realize that the catastrophes they worry about would, in all likelihood, never occur. Borkovec and colleagues (Borkovec et al., 1999) base this conclusion on a study

involving patients undergoing treatment for GAD (cognitive therapy with specific emphasis on patients' beliefs about worry and the possible benefits of these beliefs), college students meeting the diagnostic criteria for GAD but who were not in treatment, and college students not suffering from GAD. All participants were instructed to record their daily worries over the same two-week period. More specifically, participants were required to note each topic about which they worried and then, over the two-week period, record whether each of these situations turned out better or worse than they had anticipated. Seventy percent of the participants in the two groups of students (students with GAD, students without GAD) reported that the situations they worried about ended up having a more positive outcome than they had anticipated. Moreover, among the patients undergoing treatment for GAD, 85% of the situations that were a source of worry to these individuals were rated as having had a more positive outcome than they had initially anticipated. Given the tendency amongst individuals suffering from GAD to fear that they would be unable to cope with negative events, Borkovec and co-workers (1999) requested the GAD patients in their sample to rate whether they felt that they had coped with the feared situations better or worse than they had expected to. The GAD patients viewed themselves as coping better than they had expected to in 79% of the situations they had identified.

The preceding studies suggest that the advantages that individuals often ascribe to worrying (a source of motivation, a method for avoiding negative outcomes and preparing for catastrophe) are unfounded most of the time. However, owing to the avoidant function of worry, many individuals continue to view the fact that catastrophes do not befall them or that they are able to cope with many of the challenges they do encounter as benefits of worrying. As such, the avoidant function of worry and positive beliefs about worry interact to facilitate continued engagement in worry.

3.2.3.4 Worry as a strategy for distraction from distressing emotional topics

According to the avoidance model of worry and GAD, worrying about a particular topic may function to distract an individual from other, more emotionally valenced topics or themes (Borkovec et al., 2004). Empirical research has not yet established what the specific content of such emotionally valenced topics or themes may be. However, research on GAD has identified at least three possible areas in which significant negative events may contribute to

negative emotional experiences about which the individual would rather not think (Borkovec et al., 2004). The focus of these areas appears to be primarily related to interpersonal matters revolving around (1) past traumatic events, (2) early childhood relationships and (3) significant interpersonal problems in current relationships.

Individuals suffering from GAD report significantly more traumatic past events when compared to people in control groups (Roemer et al., 1997; Roemer, Molina, Litz & Borkovec, 1996). Moreover, Blazer, Hughes and George (1987), found that individuals reporting one or more unanticipated, negative, significant life events were three times more likely to suffer from GAD than those not experiencing similar negative life events. Borkovec et al. (2004) have hypothesized that, if individuals suffering from GAD in general report a higher incidence of traumatic life events, the worry they engage in may function to avoid thoughts related to traumatic incidents. In a similar vein, Roemer et al. (1996) found that individuals suffering from GAD were inclined to report higher frequencies of past traumatic experiences such as physical injury, rape, assault, combat and seeing someone badly hurt or killed than individuals not suffering from GAD were. However, in another study, Roemer et al. (1997) found that, although individuals diagnosed with GAD were more inclined to report traumatic histories when compared to controls, they also tended to report worrying about distressing past experiences to a lesser degree than non-GAD controls did. Consequently, individuals suffering from GAD would appear to be less inclined to experience worry related to past traumatic events, despite generally having more traumatic histories than controls. Borkovec et al. (2004) advance two possible explanations for this phenomenon: Either these individuals have learned to deal with traumatic events through cognitive activity, or they may be avoiding the memories of these emotionally distressing topics by engaging in worry related to other less distressing topics or concerns.

Borkovec et al. (2004) speculate that negative childhood experiences could possibly shed light on the content of the emotionally distressing topics that individuals suffering from GAD attempt to avoid by engaging in worry. One specific area of negative childhood experiences that has been identified involves role-reversed or enmeshed relationships with a primary caregiver (Borkovec et al., 2004; Borkovec et al., 1999). In this regard, a number of studies propose that attachment might play an important role in understanding the developmental background of worry, GAD and anxiety in general (Cassidy, Lichtenstein-Phelps, Sibrava,

Thomas & Borkovec, 2009; Cassidy & Mohr, 2001; Eng & Heimberg, 2006; Guttman-Steinmetz & Crowell, 2006; Viana & Rabian, 2008). For this reason, it seems that GAD may be associated with a specific form of insecure childhood attachment (Cassidy et al., 2009). According to Borkovec et al. (2004), individuals suffering from GAD may thus worry about relatively superficial concerns to distract themselves from thoughts of a distressing childhood. However, in all probability, issues related to insecure childhood attachment or recollections of a distressing childhood are not the only distressing emotionally laden topics that individuals suffering from GAD would rather not think about. Additional research is necessary before meaningful conclusions can be reached regarding the content of topics for which individuals with GAD use worry to avoid.

3.2.4 Summary

It is evident from literature that worry is viewed primarily as a verbal-linguistic, thought-based activity rather than an imagery-based thought activity (Borkovec et al., 1998; Borkovec & Inz, 1990; Freeston et al., 1996). In addition, literature seems to suggest that worry functions as a cognitive avoidance strategy resulting in the suppression of somatic/physiological responses to threatening or fear-provoking stimuli. However, it appears as though this suppression of somatic or physiological reaction is achieved at the expense of effective emotional processing of the threat stimulus (Borkovec et al., 1998; Borkovec & Hu, 1990). The available research also suggests that worry may be employed as a means of coping with anticipated negative outcomes (Borkovec et al., 1999; Borkovec & Roemer, 1995). However, the majority of negative outcomes that individuals worry about seem never to occur (Borkovec et al., 1999). Therefore, the avoidant function that worry serves appears to reinforce people's beliefs in worry as an effective coping strategy. According to the avoidance model of worry and GAD, worrying about a particular topic may function to distract an individual from more distressing topics (Borkovec et al., 2004). Empirical work on GAD proposes that distressing topics might involve past traumatic events, negative childhood experiences and significant interpersonal difficulties (Blazer et al., 1987; Cassidy et al., 2009; Eng & Heimberg, 2006; Roemer et al., 1997).

The studies reviewed in this section utilising clinical and non-clinical samples generally seem to provide support for several aspects of the avoidance model of worry and GAD. First,

worry appears to be primarily a verbal-linguistic, thought-based activity, as opposed to an imagery-based thought activity. Second, worry appears to suppress somatic and physiological responses to threatening stimuli, but does so at the expense of effective emotional processing of these stimuli. Third, research appears to support the theory that worry is generally considered, by individuals with GAD in particular, to be an effective means of coping with anticipated negative outcomes. However, these positive beliefs about worry appear to result in fewer opportunities to process fear-related stimuli effectively or to disprove the efficacy of worry as a coping strategy. Finally, some evidence does seem to exist to suggest that, at least among some individuals suffering from GAD, worrying about apparently superficial concerns may serve to avoid thinking about more distressing past events.

3.3 THE METACOGNITIVE MODEL OF GAD

3.3.1 Introduction

According to Wells (2007), traditional cognitive-behavioural therapy approaches do not seem to result in sufficient relief of symptoms, as these treatment approaches do not address the metacognitive aspects underlying emotional disorders adequately. Consequently, there has recently been an increased tendency to address the role of metacognition in models of psychopathology (Nelson, Stuart, Howard, & Crowley, 1999; Wells & Papageorgiou, 1998). Wells and Matthews (1994) proposed the self-regulatory model of executive function (S-REF). The S-REF model suggests that worry and rumination are general components of emotional disorders and that they are driven by metacognitive beliefs. This particular perspective on worry has resulted in a metacognitive explanation for worry based on the S-REF model. The resulting metacognitive model of GAD proposed by Wells (1995) suggests that people suffering from GAD appear to have both positive and negative beliefs about worry. In this model, negative metacognitive beliefs in particular appear to be a central element in the development and maintenance of GAD. The metacognitive model of GAD, which attempts to explain the factors resulting in uncontrollable and excessive worry in GAD, will be discussed in this part of the chapter. Available empirical evidence for the model will also be reviewed.

3.3.2 The metacognitive model of GAD

Wells (1995) developed a model primarily to explain the metacognitive processes involved in the development and maintenance of uncontrollable and excessive worry. As excessive and uncontrollable worry is considered central to GAD, the metacognitive model of GAD (Wells, 1995) is said to provide an account of the development and maintenance of GAD. This model is based on a combination of experimental cognitive work on worry (Wells, 1994) and clinical experience (Wells & Matthews, 1994). The metacognitive model of GAD is based on the principle that metacognitive beliefs, metacognitive appraisals and thought-control

strategies are key factors in the development and maintenance of excessive and uncontrollable worry that is associated with GAD (Wells, 2007).

In general, cognitive models of GAD tend to focus on maladaptive beliefs about the social self or the world as a dangerous place. In contrast, the metacognitive model of GAD focuses on the role of metacognitive beliefs and appraisals in the development and maintenance of excessive and uncontrollable worry. Proponents of the metacognitive perspective suggest that traditional cognitive-behavioural therapy approaches fail to effect significant symptom reduction in GAD because these approaches do not adequately address the metacognitive mechanisms underlying GAD (Wells, 2007). The key components of the metacognitive model of GAD are illustrated in *Figure 2*.

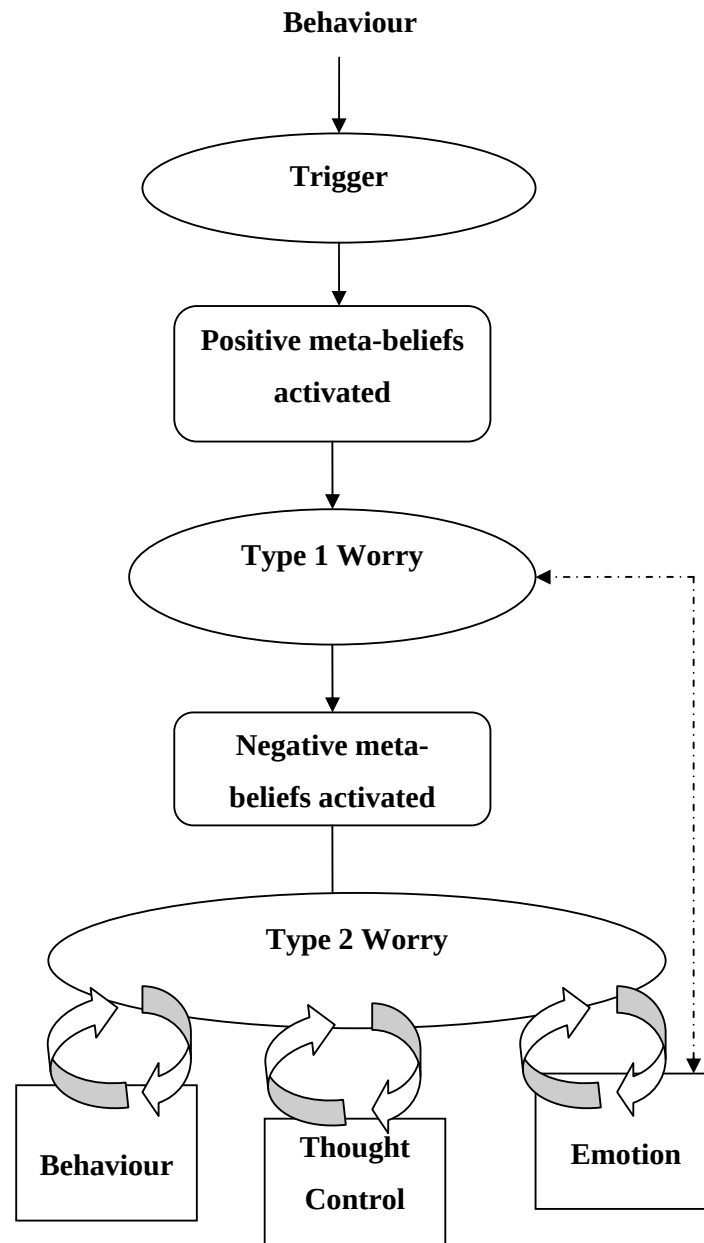


Figure 2. The metacognitive model of GAD (Reproduced from Wells, 1997, p. 204)

The metacognitive model of GAD views excessive worry as being central to GAD. Consequently, this model attempts to explain how worry specifically contributes to the development and maintenance of GAD. The metacognitive model of GAD (Wells, 1995; Wells, 1997; Wells 1999a; Wells, 2007) proposes that individuals suffering from GAD tend to use worry as a coping strategy in response to particular threat-related triggers. Triggers for

worry vary (labelled as *trigger* in *Figure 2*), but they are said to occur typically in the form of intrusive thoughts. Intrusive thoughts commonly occur as a "what-if?" question (e.g. "What if my partner is involved in an accident?"). This type of questioning is referred to as an automatic questioning style and appears to be an important feature of anxiety-related cognitive products (Vasey & Borkovec, 1992). Intrusive thoughts (triggers) can also occur in the form of negative images, such as an image of being involved in an accident.

According to the metacognitive model of GAD, threat-related triggers activate positive metacognitive beliefs about worry as a means of coping with events represented in intrusive thoughts or images. According to Wells (1997), individuals suffering from GAD tend to use worry as a predominant means of coping with threat-related triggers. These individuals view worry as a coping strategy in which chains of intrusive "what-if?" catastrophising questions are asked in an attempt to generate ways of coping. Thus, once an individual suffering from GAD appraises a situation or event as threatening (*trigger* in *Figure 2*), positive beliefs about worry, in which the individual believes that worry serves a protective or coping function, are activated (*positive meta-beliefs activated* in *Figure 2*) and worry-based processing is selected (*strategy selection* in *Figure 2*) as a means of continued appraisal and coping. The metacognitive model of GAD emphasises that, like most other people; individuals suffering from GAD tend to have positive beliefs about the benefits of worry as a coping mechanism (Wells, 1997). According to Wells (1997), examples of positive beliefs about worry could include the following: "If I worry about the worst and I can see myself coping, then I probably will cope if it happens," "If I worry, I can prevent bad things from happening" and, "If I worry, I can always be prepared" (p. 203).

Individuals suffering from GAD are said to execute worry sequences in which a range of "what-if?", danger-related questions are contemplated and potential strategies for dealing with intrusive thoughts and images are devised. This process, known as Type 1 worry, is associated with changes in emotion, as indicated by the bi-directional dotted line in *Figure 2*. The contemplation of dangerous scenarios leads to the activation of an anxiety response with associated cognitive and somatic symptoms (labelled as *emotion* in *Figure 2*). The relationship between Type 1 worry and emotional responses is such that Type 1 worry may increase or decrease anxiety, depending on whether the problem that has triggered worry has been resolved or not (Wells, 1995). Type 1 worry is mediated by the extent to which an

individual perceives him- or herself as being adequately prepared to deal with an anticipated threat. Initially, Type 1 worry may result in an increase in anxiety-related cognitive and somatic symptoms as negative outcomes are processed, but these symptoms are inclined to subside once the individual feels that he/she has generated sufficient options (partially by engaging in worry) to cope with the anticipated threat. Consequently, prolonged episodes of worry may lead the individual to perceive him- or herself as being adequately prepared to cope with an anticipated threat which, in turn, would result in a reduction in anxiety. The reduction of anxiety following periods of worry may thus serve to reinforce the subsequent activation of Type 1 worry during future threat appraisals (Wells, 1997; Wells, 1999b).

According to Wells (1995), the crucial element in the development and maintenance of GAD is negative beliefs about worry. Excessive worry conditions such as GAD develop when negative beliefs about worry are activated. The central theme of negative beliefs about worry is that worry is uncontrollable and potentially dangerous. According to Wells (1997), these negative beliefs about worry include "I could go crazy with worrying" or "Worrying is harmful" (p. 202). The activation of negative beliefs about worry leads to a negative appraisal of worry, or Type 2 worry, also known as meta-worry (Wells, 1995). Type 2 worry is associated with negative appraisals about an individual's own thought processes. Once Type 2 worry occurs, threat appraisals are emphasized, leading to intensifications in anxiety responses, as represented by the feedback cycle between Type 2 worry and emotion in *Figure 2*. Type 2 worry often leads to rapid increases in anxiety. For example, if an individual appraises his or her worry or anxiety symptoms as a sign of immediate loss of control or mental breakdown, rapid increases of anxiety may occur. Increasing anxiety is often interpreted as a sign of likely failure of coping efforts, resulting in a continuation of Type 1 worry in an attempt to create an internal state of reassurance that it is safe to terminate the worry process. Therefore, negative appraisals of worry (Type 2 worry) – which develop from negative beliefs about worry – prolong worry and interfere with an individual's ability to identify an internal signal that it is safe to disengage from the worry process (Wells, 1995).

Two further mechanisms associated with Type 2 worry and negative beliefs about worry contribute to the maintenance of excessive and uncontrollable worry (Wells, 1995). These are labelled as *behavioural responses* and *thought control* in *Figure 2*. Typically, behavioural responses and thought-control strategies are problematic, as they prevent exposure to

situations that would help to disconfirm the content of Type 2 worry and negative metacognitive beliefs about the uncontrollability and dangers of worry. Behaviours such as seeking reassurance and avoiding situations that trigger intrusive thoughts maintain negative beliefs about loss of control and the danger of worry (Wells, 1995; Wells, 2006). Similarly, avoiding situations or stimuli that might trigger worry often deny individuals the opportunity to discover that worry is futile (Wells, 1995). Seeking reassurance is also believed to maintain negative beliefs about worry (Wells, 1995) by shifting the control of thoughts, and worry in particular, to an external agent or criterion. In turn, obtaining reassurance deprives an individual of the opportunity to learn that he/she is capable of controlling his/her own worry.

Thought control is also implicated in the maintenance of excessive worry (Wells, 1995). Most individuals consider worry helpful for a number of reasons. Consequently, not many attempts are made to interrupt Type 1 worry before the goal of worry is achieved. Interrupting worry prior to attaining the goal of worrying would equate to not coping (Wells, 1995). As a result, people who engage in excessive and uncontrollable worry do not have much experience of controlling or effectively interrupting the worry process. Consequently, most negative appraisals about loss of control and the danger of worry these individuals hold remain unchallenged (Wells 1999b). Rather than interrupting the worry process, individuals who engage in excessive and uncontrollable worry tend to utilise a variety of thought-control strategies. These strategies include distraction, suppression, self-talk and trying not to think about specific topics that initially triggered worry (Wells, 1999b). These strategies are labelled as *thought control* in *Figure 2*. However, a disadvantage of using thought-control strategies such as thought suppression is that the attempts to suppress unwanted thoughts may inadvertently increase the occurrence of unwanted thoughts, as demonstrated experimentally by Purdon (1999) and by Wegner, Schneider, Carter and White (1987).

3.3.3 Empirical support for the metacognitive model of GAD

Research on individuals with high scores on measures of worry such as the Penn State Worry Questionnaire (PSWQ) and research on people suffering from GAD appears to provide support for the core components of the metacognitive model of GAD (Cartwright-Hatton & Wells, 1997; Davis & Valentiner, 2000; Wells & Carter, 2001; Wells & Papageoriou, 1998).

The empirical literature on metacognition and worry will be reviewed here, with particular emphasis on the following components of the model:

- The role of positive and negative metacognitive beliefs in excessive worry.
- Meta-worry (Type 2 worry).
- The role of thought-control strategies.

3.3.3.1 The role of positive and negative metacognitive beliefs in excessive worry

The metacognitive model of GAD proposes that positive beliefs about worry appear to be common to most people, whereas negative beliefs about worry appear to be unique to those suffering from GAD or engaging in excessive worry (Cartwright-Hatton & Wells, 1997; Davis & Valentiner, 2000; Ruscio & Borkovec, 2004; Wells, 1999a; Wells & Carter, 2001; Wells & Papageoriou, 1998). Findings from several studies indicate that positive beliefs about worry appear to be common to people suffering from GAD, high worriers not meeting the diagnostic criteria for GAD (Ruscio & Borkovec, 2004) and low worriers (Cartwright-Hatton & Wells, 1997; Davis & Valentiner, 2000; Wells & Carter, 2001; Wells & Papageoriou, 1998). However, individuals suffering from GAD report significantly more negative beliefs about worry relative to people suffering from mood disorders (Cartwright-Hatton & Wells, 1997), social anxiety disorder (Wells & Carter, 2001) and panic disorder (Davis & Valentiner, 2000). Individuals suffering from GAD also experience significantly more negative beliefs about worry when compared to individuals presenting with sub-clinical anxiety or worry, as well as when compared to non-anxious controls (Cartwright-Hatton & Wells, 1997; Davis & Valentiner, 2000; Ruscio & Borkovec, 2004; Wells, 2005; Wells & Carter, 2001). Furthermore, Ruscio and Borkovec (2004) have demonstrated that negative beliefs about worry are characteristic of individuals suffering from GAD and of high worriers without GAD. However, when high worriers with GAD are compared to high worriers without GAD, it becomes apparent that individuals with a diagnosis of GAD exhibit significantly more negative beliefs about worry than equally worried individuals who do not meet the diagnostic criteria for GAD (Ruscio & Borkovec, 2004). Therefore, negative beliefs about worry would appear to be specifically related to GAD.

3.3.3.2 The role of meta-worry (Type 2 worry) in excessive worry

According to the metacognitive model of GAD, meta-worry (Type 2 worry), which develops because of negative beliefs about worry, plays an important role in the development and maintenance of excessive and uncontrollable worry (Wells, 1999b). Nuevo, Montorio and Borkovec (2004), as well as Wells and Carter (1999), found that Type 2 worry (meta-worry) is associated exclusively with excessive worry, independent of Type 1 worry and trait anxiety. However, it should be noted that both these studies used the Anxious Thought Inventory (AnTI, Wells, 1994) to assess Type 1 and Type 2 worry. One of the limitations of the AnTI is that, although one of its subscales assesses meta-worry, this subscale combines appraisals of uncontrollability with appraisals of danger. The combination of appraisals of uncontrollability and danger when investigating DSM-IV-TR GAD could result in potential circularity, as appraisals of uncontrollability are included as a diagnostic criterion for GAD in the DSM-IV (APA, 2000). Wells (2005) developed the Meta-worry Questionnaire (MWQ) to address the limitations of the AnTI, and thus provided a measure of meta-worry that was more closely aligned with the metacognitive model of GAD and recent DSM-IV formulations (APA, 2000) of GAD (Wells, 2005). Using the MWQ, Wells (2005) found that individuals with a self-report diagnosis of GAD could be distinguished reliably from individuals with somatic anxiety and non-anxious individuals on the basis of meta-worry. Thus, it would appear that a specific link might exist between meta-worry (Type 2 worry) and excessive worry, particularly in the context of GAD.

3.3.3.3 The role of thought-control strategies in excessive worry

Wells (1995) proposes that individuals who engage in excessive worry may also utilize a variety of strategies to try to control their worry. However, studies exploring thought-control strategies in GAD appear to be limited. Coles and Heimberg (2005) conducted one of the few studies examining the methods of thought control used by individuals suffering from GAD. These researchers used the Thought Control Questionnaire (Wells & Davies, 1994) to compare the thought-control strategies employed by individuals suffering from GAD to strategies employed by controls. The Thought Control Questionnaire samples five thought-control strategies, namely distraction, punishment, reappraisal, social control and worry to

control unnecessary and unpleasant thoughts. Coles and Heimberg (2005) found that the GAD participants in their study were more inclined to make use of worry-based and punishment-related strategies to control their thoughts, whereas the controls in the study were more inclined to make use of social control and distraction to try and control their thoughts (Coles & Heimberg, 2005).

The preference for worry-based and punishment-related thought-control strategies among individuals suffering from GAD reported by Coles and Heimberg (2005), appears to be consistent with findings of several studies that have examined thought-control strategies in other anxiety disorders such as post-traumatic stress disorder (Reynolds & Wells, 1999) and obsessive-compulsive disorder (Abramowitz, Whiteside, Kalsy, & Tolin, 2003). As with the GAD participants in the Coles and Heimberg study, individuals suffering from post-traumatic stress disorder (Reynolds & Wells, 1999) and those suffering from obsessive compulsive disorder (Abramowitz et al., 2003) most frequently tended to make use of punishment-related strategies and worry to attempt to control their thoughts. Consequently, the use of punishment-related and worry-based strategies to control thoughts may be common to a variety of anxiety disorders.

A limited number of studies also explored the effects of suppressing worry (Becker, Rink, Roth & Markgraf, 1998; Mathews & Milroy, 1994; McLean & Broomfield, 2007). Some of these studies explored thought suppression as a means of thought control. Existing experimental literature tends to suggest that thought suppression is not an effective method of thought control (Purdon, 1999; Wegner et al., 1987). More specific to GAD, Becker et al. (1998) report that thought suppression proved ineffective in reducing the duration of worry episodes among individuals suffering from GAD, speech phobic individuals and non-anxious controls. Similarly, Mathews and Milroy (1994) found that thought suppression had no effect on the duration of worry experienced by high or low worriers. However, McClean and Broomfield (2007) found that, after suppressing a chosen worry for a week, high worriers spent less time thinking about the specific worry that they had been suppressing, while reporting a significant increase in worry controllability. The efficacy of thought suppression as a strategy for controlling worry appears questionable. However, more research on the effects of thought suppression on worry is warranted.

3.3.4 Summary

It is evident from the literature that excessive and uncontrollable worry develops because of positive and negative beliefs about worry (Cartwright-Hatton & Wells, 1997; Davis & Valentiner, 2000; Ruscio & Borkovec, 2004; Wells & Carter, 2001; Wells & Pappageorgiou, 1998). According to the metacognitive model of GAD, people are inclined to utilise worry as a means of coping with a potential threat. Worry, as a coping strategy, is activated by the positive beliefs many individuals hold about worry. These positive beliefs about worry encourage the implementation of Type 1 worry and may initially lead to an increase in anxiety responses (Wells, 1995). However, anxiety is said to decrease when an individual feels that he/she will be able to cope effectively with the anticipated threat. Put differently, anxiety decreases when the goals of worry are met. The decline in anxiety following prolonged worry episodes may reinforce the use of worry as a coping strategy when future threat appraisals occur (Wells, 1995). Nonetheless, the activation of negative beliefs about worry and appraisals of worry as dangerous and uncontrollable (Type 2 worry) predominantly contribute to the development and maintenance of excessive and uncontrollable worry (Wells, 1999a). Once Type 2 worry is established, negative beliefs about worry may promote attempts to avoid or suppress worry. Furthermore, negative beliefs about worry have been hypothesised to make a significant contribution to the development of the excessive and uncontrollable worry that is characteristic of GAD (Ruscio & Borkovec, 2004).

The studies reviewed in this section, utilising both clinical and non-clinical samples, seem to provide support for several components of the metacognitive model of GAD. First, positive and negative beliefs about worry seem to be related to worry. Second, positive beliefs about worry appear to be common to all worriers, while negative beliefs about worry and meta-worry appear to be relatively unique to individuals suffering from GAD and individuals who engage in excessive and uncontrollable worry. Third, a number of studies seem to suggest that people generally tend to make use of a variety of thought-control strategies in an attempt to control their worry or to suppress intrusive thoughts or images that trigger worry. However, these strategies appear to be limited in their effectiveness. Individuals suffering from GAD seem to make use of worry-based and punishment-related strategies most frequently to control their thoughts.

3.4 THE INTOLERANCE OF UNCERTAINTY MODEL

3.4.1 Introduction

Dugas and colleagues (Dugas et al., 1998) developed a cognitive-behavioural model of GAD that highlights four variables in the development and maintenance of excessive worry. More specifically, intolerance of uncertainty, positive beliefs about worry, negative problem orientation and cognitive avoidance are hypothesised to underlie the development and maintenance of excessive worry. However, intolerance of uncertainty is purported to be the central component in the model.

Intolerance of uncertainty is a cognitive bias influencing the way in which individuals perceive, interpret and respond to uncertain or ambiguous situations. Intolerance of uncertainty is often evident in the cognitive, emotional and behavioural reactions of an individual to ambiguous or uncertain situations (Koerner & Dugas, 2006). Furthermore, "intolerance of uncertainty can be seen as a filter through which individuals view their environment, which might be best described as a predisposition to find uncertainty unacceptable" (Buhr & Dugas, 2002, p. 933). Accordingly, it can be said that people who are intolerant of uncertainty tend to interpret ambiguous information as threatening (Heydayati, Dugas, Buhr, & Francis, 2003).

It has been noted that intolerance of uncertainty is regarded as the key component of the intolerance of uncertainty model of excessive worry. The developers of this model view the responses and reactions of individuals suffering from GAD as resulting from the belief that uncertainty is intolerable (Koerner & Dugas, 2006). The second component of the intolerance of uncertainty model is positive beliefs about worry. Similar to the originators of the other models of excessive worry and GAD that have been reviewed earlier in this chapter, Freeston and colleagues (1994) conceptualise positive beliefs about worry as a tendency to believe that engaging in worry will result in positive outcomes such as increased preparedness for disasters and emergencies. Negative problem orientation is the third cognitive component of the intolerance of uncertainty model of excessive worry. Negative problem orientation may be defined as a set of metacognitive processes underpinning a tendency to view problems as

threatening and unsolvable, as well as doubting one's problem-solving abilities (Maydeu-Olivares & D'Zurilla, 1996). Cognitive avoidance is the fourth component of the model and refers to a variety of strategies implemented by individuals to avoid threatening thoughts and images (Koerner & Dugas, 2006).

The intolerance of uncertainty model will be discussed in this part of the chapter. The available empirical evidence for the individual components of the intolerance of uncertainty model and for the model as a whole will also be reviewed.

3.4.2 The intolerance of uncertainty model

The intolerance of uncertainty model attempts to explain how four cognitive variables, namely intolerance of uncertainty, positive beliefs about worry, negative problem orientation and cognitive avoidance promote the development and maintenance of excessive worry (Dugas et al., 1998; Dugas, Freeston & Ladouceur, 1997; Dugas et al., 2001; Koerner & Dugas, 2006). This model suggests that intolerance of uncertainty may lead to high levels of worry through positive beliefs about worry, negative problem orientation and cognitive avoidance. The relationship between intolerance of uncertainty and the three other cognitive components of the model is represented in *Figure 3*.

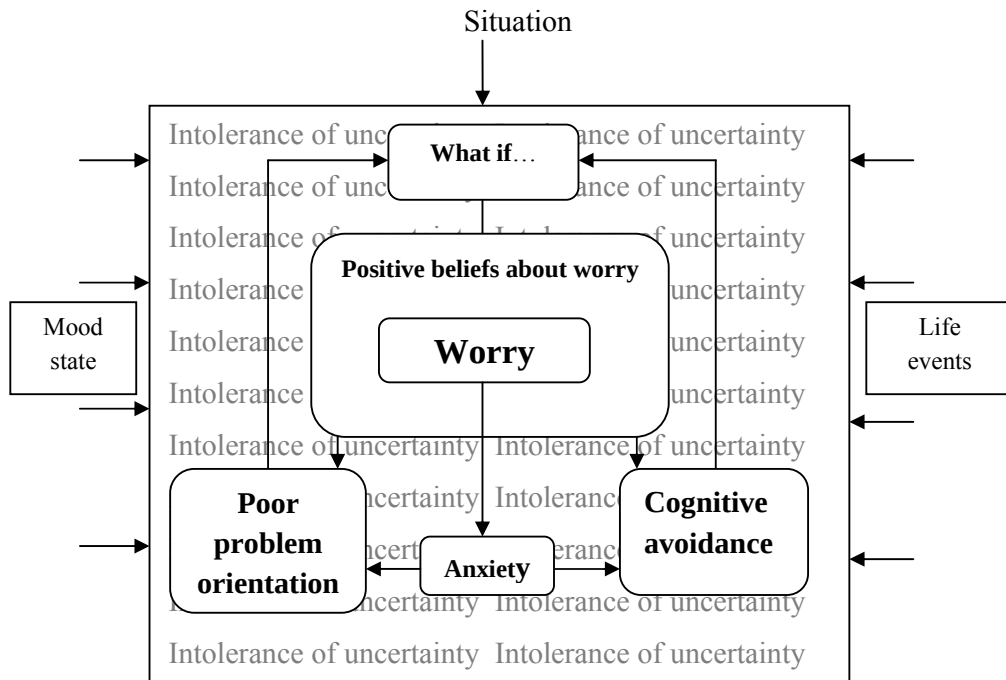


Figure 3. The intolerance of uncertainty model (Reproduced from Dugas et al., 1998, p. 216)

The intolerance of uncertainty model (Dugas et al., 1998; Dugas & Robichaud, 2007; Koerner & Dugas, 2006) proposes that worry cycles are initiated most often by triggers (labelled as *situation* in Figure 3). The aforementioned triggers tend to take the form of either external, observable events such as an argument with a friend or moving house (labelled *life events* in Figure 3) or internal events such as feelings of tightness in the chest, or concerns about finances (labelled *mood state* in Figure 3). These triggers frequently give rise to intrusive thoughts that commonly occur in the form of "What if...?" questions. These "What if...?" questions set in motion a chain of future-oriented and uncertainty-related thoughts (labelled as *worry* in Figure 3). This worry is often centred round "What if...?" questions that are characterised by uncertainty or ambiguity. Worry cycles are maintained by beliefs that worry is beneficial in dealing with situations that are ambiguous or situations where the outcome is uncertain (labelled as *positive beliefs about worry* in Figure 3). These positive beliefs about worry include beliefs that worry enhances problem-solving; that worry increases motivation, that worry protects against negative emotion, that worry is a positive personality trait and that worry helps prevent negative outcomes from occurring or at least ensures that the individual is adequately prepared to deal with them if they do occur (Francis & Dugas, 2004; Holowka, Dugas, Francis & Langersen, 2000).

The chains of future-oriented, uncertainty-related thinking (worry) reported above frequently result in emotional discomfort and somatic sensations characteristic of anxiety (labelled as *anxiety* in *Figure 3*). In individuals that suffer from GAD in particular, chronic worry may lead to physical symptoms (e.g. muscle tension, fatigue) and/or psychological symptoms (irritability, difficulty concentrating) of anxiety. According to *Figure 3*, both the somatic experience of anxiety and worry interact with the individual's appraisal of the problem/situation facing him/her, as well as his/her appraisal of his/her own problem-solving abilities. This interaction tends to result in an overestimation of the extent of the problem/situation and an underestimation of the individual's problem-solving abilities (labelled as *negative problem orientation* in *Figure 3*). Similarly, anxiety and worry may result in a tendency to suppress distressing intrusive thoughts or to attempt to avoid thinking about the problem/situation (labelled *cognitive avoidance* in *Figure 3*). In turn, negative problem orientation and cognitive avoidance are hypothesised to feed back into the cycle of uncertainty and ambiguity by giving rise to additional "what if?" questions or promoting the cyclical nature of such thinking. This process results in the excessive and recurrent worry that is characteristic of GAD (Dugas et al., 1997; Dugas et al., 1998; Dugas et al., 2001; Koerner & Dugas, 2006).

According to Dugas and Robichaud (2007), intolerance of uncertainty – the tendency to experience ambiguous situations or situations where the outcome is uncertain as distressing or intolerable – (labelled as *intolerance of uncertainty* in *Figure 3*) fuels the worry process. It is hypothesised that the less tolerant an individual is of uncertainty, the more inclined he/she is to ask "what if?" questions in response to a trigger. Thus, intolerance of uncertainty is thought to play a role in the initiation of worry. Moreover, intolerance of uncertainty is believed to underpin positive beliefs about worry, negative problem orientation and cognitive avoidance (Dugas et al., 1997; Dugas et al., 1998; Dugas et al., 2001; Koerner & Dugas, 2006). Intolerance of uncertainty is also hypothesised to play a central role in the maintenance and perpetuation of worry cycles.

Intolerance of uncertainty is said to contribute directly to positive beliefs about worry. As stated previously, individuals often consider worry functional in that worrying is perceived as enhancing problem-solving, increasing motivation, protecting against negative emotions, being a positive personality trait and preventing negative outcomes (Francis & Dugas, 2004;

Holowka et al., 2000). Consequently, some individuals may view worry as an effective means of attempting to gain a greater degree of control over a situation, making the outcome of a situation more predictable and generally reducing the uncertainty inherent in many situations confronting people (Dugas, Buhr & Ladouceur, 2004; Koerner & Dugas, 2006). Thus, intolerance of uncertainty may result in an initial tendency to hold positive beliefs about worry. However, over time, individuals who are intolerant of uncertainty may come to attribute the successful resolution of problems or the less than catastrophic outcomes of situations to the perceived positive effects of worry. In this way, intolerance of uncertainty may play a role in the reinforcement of positive beliefs about worry (Dugas et al., 2004; Koerner & Dugas, 2006). Moreover, the successful resolution of problems and positive situational outcomes may also reinforce intolerance of uncertainty, thus increasing the likelihood that an individual would make use of worry believing that worrying reduces uncertainty and ambiguity (Dugas et al., 2004; Koerner & Dugas, 2006).

Intolerance of uncertainty is also hypothesised to contribute to the development of a negative problem orientation. Dugas and colleagues (Dugas et al. 1997; Dugas et al., 2004; Dugas, Letarte, Rhéaume, Freeston & Ladouceur, 1995; Ladouceur et al., 1999) suggest that intolerance of uncertainty leads to negative problem orientation by affecting an individual's appraisal of a problem and his/her appraisal of his/her problem-solving ability. More specifically, intolerance of uncertainty may predispose an individual to focus on specific aspects (often the most threatening aspects) of a problem, resulting in the perception that the problem is more serious or imposing than it really is (Dugas et al., 1997; Dugas et al., 2004). Furthermore, the stress and frustration that individuals with high levels of intolerance of uncertainty experience when faced with ambiguous situations or problems with an uncertain outcome may result in stress and frustration which, in turn, could lead to a reduction in the availability of cognitive and emotional resources necessary for effective problem-solving (Dugas et al., 1997; Dugas et al., 2004). This could result in reduced problem-solving efficacy and further strengthen the individual's perception that his/her problem-solving abilities are not effective. However, the relationship between intolerance of uncertainty and negative problem orientation does not appear to be unidirectional. According to Dugas and colleagues (Dugas et al., 1997; Dugas et al., 2004), threat appraisal, low problem-solving efficacy expectations and negative problem-solving outcome expectations may influence an

individual's perception of uncertainty inherent in other situations. Intolerance of uncertainty would thus appear to influence and be influenced by negative problem orientation.

Dugas and colleagues (Dugas et al., 2004; Dugas & Ladouceur, 2000) speculated that intolerance of uncertainty may exert an influence on an individual's tendency to attempt to avoid or suppress threatening thoughts or images. Individuals who are intolerant of uncertainty may find it distressing to be exposed to images of potentially threatening situations or outcomes (Dugas & Robichaud, 2007). Consequently, such individuals may be inclined to attempt to avoid mental images associated with the potentially negative outcomes of a situation. These individuals then engage in either implicit cognitive avoidance or explicit cognitive avoidance or both. Implicit cognitive avoidance refers to the avoidance of threatening mental imagery in favour of verbal-linguistic thoughts or worry, while explicit cognitive avoidance may include attempts to suppress threatening thoughts or images, avoidance of situations that trigger these cognitions, attempts at stopping thinking or distraction and attempts to replace threatening thoughts and images with neutral ones (Dugas & Robichaud, 2007). However, it has been well established that cognitive avoidance inhibits the extinction of fear responses (Borkovec et al., 1998; Borkovec & Inz, 1990; Laguna et al., 2004). Consequently, paradoxically, cognitive avoidance may result in an increase of threatening images and thoughts, thus increasing the uncertainty in numerous situations. In turn, the increasing uncertainty would increase the distress experienced by individuals who are intolerant of uncertainty, potentially resulting in an increase in the use of cognitive avoidance (Dugas et al., 2004; Dugas & Robichaud, 2007). Dugas and colleagues (Dugas et al., 2004; Dugas & Robichaud, 2007) postulate that the preceding cycle of cognitive avoidance and intolerance of uncertainty significantly contributes to the excessive worry characteristic of GAD.

3.4.3 Empirical support for the intolerance of uncertainty model and its components

The intolerance of uncertainty model proposes that intolerance of uncertainty, positive beliefs about worry, negative problem orientation and cognitive avoidance are central to the development and maintenance of excessive worry and GAD (Dugas et al., 1998). In this

section, the available empirical literature will be reviewed with particular reference to the following components of the intolerance of uncertainty model:

- Intolerance of uncertainty.
- Positive beliefs about worry.
- Negative problem orientation.
- Cognitive avoidance.

The available evidence for the model as a whole will also be reviewed.

3.4.3.1 Intolerance of uncertainty

A number of studies appear to demonstrate a relationship between worry and intolerance of uncertainty (Dugas et al., 2001; Ladouceur et al., 1999). Furthermore, this relationship between worry and intolerance of uncertainty appears evident in samples of GAD patients as well as in samples of high worriers who do not meet the diagnostic criteria for GAD (Buhr & Dugas, 2002; Dugas et al., 1997; 1998).

Initial studies using non-clinical samples demonstrated a strong relationship between intolerance of uncertainty and excessive worry (Dugas et al., 1997; Buhr & Dugas, 2002). A study carried out by Dugas et al. (2001) suggests that intolerance of uncertainty is more strongly related to worry, than to obsessions and panic symptoms in a non-clinical sample. In addition, the findings from a study by Dugas, Schwartz and Francis (2004) demonstrate that intolerance of uncertainty is more strongly related to excessive worry than to depressive symptoms in a non-clinical sample. Similarly, Buhr and Dugas (2006) suggest that excessive worry is more strongly related to intolerance of uncertainty than to perfectionism or a need for control, among non-clinical individuals. However, at least one study has failed to find a significant relationship between intolerance of uncertainty and worry. In a study utilising a non-clinical sample, Holaway, Heimberg and Coles (2006) found that the relationship between intolerance of uncertainty and worry was not significantly stronger than the relationship between intolerance of uncertainty and obsessive-compulsive symptoms. Nonetheless, current empirical literature would generally appear to support the notion that a

significant relationship exists between intolerance of uncertainty and worry in non-clinical samples.

A number of studies investigated the relationship between intolerance of uncertainty and excessive worry in clinically anxious samples. Ladouceur et al. (1999) compared levels of intolerance of uncertainty in individuals diagnosed with GAD, individuals suffering from anxiety disorders other than GAD and non-clinical controls. Both clinically anxious groups (GAD and other anxiety disorders) reported higher levels of intolerance of uncertainty than the non-clinical participants did. However, individuals diagnosed with GAD reported higher levels of intolerance of uncertainty than was reported by participants suffering from anxiety disorders other than GAD (Ladouceur et al., 1999). Similarly, in a study comparing individuals suffering from GAD to individuals suffering from panic disorder, Dugas et al. (2005) found that the individuals suffering from GAD scored significantly higher than individuals suffering from panic disorder on measures of intolerance of uncertainty.

3.4.3.2 Positive beliefs about worry

In the review of the empirical evidence supporting the metacognitive model of GAD, it was noted that several studies indicate that positive beliefs about worry appear to be common to people suffering from GAD, high worriers not meeting the diagnostic criteria for GAD (Ruscio & Borkovec, 2004), as well as low worriers (Cartwright-Hatton & Wells, 1997; Davis & Valentiner, 2000; Wells & Carter, 2001; Wells & Papageoriou, 1998). However, research in the context of the intolerance of uncertainty model appears to have focussed primarily on differences in the frequency of positive beliefs about worry across clinical and non-clinical individuals, as well as across a range of anxiety diagnoses. Furthermore, at least two studies have investigated the relationship between specific positive beliefs about worry and the intensity of worry.

Freeston et al. (1994) found that individuals with a self-report diagnosis of GAD reported a higher frequency of positive beliefs about worry than individuals who did not meet the self-report criteria for a diagnosis of GAD. Ladouceur, Blais, Freeston and Dugas (1998) measured positive beliefs about worry among individuals undergoing treatment for GAD, individuals meeting self-report criteria for a diagnosis of GAD but who were not in treatment

and individuals who did not meet the criteria for GAD on a self-report measure but who reported experiencing moderate levels of worry. Both groups of individuals diagnosed with GAD (those undergoing treatment and those with a self-report diagnosis not undergoing treatment) reported higher frequencies of positive beliefs about worry than the non-GAD moderate worriers did. In a follow-up study, Ladouceur et al. (1999) examined positive beliefs about worry in individuals suffering from GAD, individuals suffering from other anxiety disorders and non-clinical controls. Both clinical groups (GAD and other anxiety disorders) reported more positive beliefs about worry than the non-clinical controls did. However, the individuals suffering from GAD did not report significantly more positive beliefs about worry compared to the participants suffering from other anxiety disorders. Subsequently, Dugas and colleagues (2005) replicated these findings, thus lending support to the notion that elevated frequencies of positive beliefs about worry may be characteristic of clinically anxious individuals in general rather than being unique to individuals suffering from GAD.

Three studies examined the relationship between specific positive beliefs about worry and worry. Two of these studies (Davis & Valentiner, 2000; Wells & Carter, 2001) found that a combination of positive beliefs about worry predicted excessive and uncontrollable worry in non-clinical individuals. However, Bakerman, Buhr, Koerner and Dugas (2004) found that the belief that worry represented a positive personality trait superseded four other positive beliefs about worry (worry enhances problem solving, worry serves a motivating function that ensures things will get done, worry protects an individual against negative emotions and worry prevents negative outcomes) in predicting excessive worry in a non-clinical sample. Thus, it would seem that, although some empirical evidence exists to support a relationship between positive beliefs about worry and worry in clinically anxious individuals, further research is required with regard to the relationship between specific positive beliefs about worry or combinations of positive beliefs about worry and excessive worry in clinical and non-clinical samples.

3.4.3.3 Negative problem orientation

Contemporary models of problem-solving (Maydeu-Olivares, & D'Zurilla, 1996) differentiate between problem-solving skills and problem orientation. Problem-solving skills refer to the

actual skills required to solve everyday problems successfully. Problem orientation, on the other hand, refers to beliefs held by and cognitive processes activated by an individual in the face of everyday problems. According to Dugas and Robichaud (2007), excessive worry and GAD appear to be related to problem orientation, but no evidence exists for a relationship between worry and GAD and problem-solving skills. Thus, it would appear that, although individuals that are prone to excessive worry, such as individuals suffering from GAD for example, demonstrate adequate knowledge of how to go about solving problems, they seem to have difficulty in applying these skills to problem situations because of their negative problem orientation. Individuals with negative problem orientations generally tend to lack confidence in their problem-solving ability, perceive problems as threats, become easily frustrated when confronted with problems, and tend to be pessimistic regarding the outcome of their problem-solving efforts (Koerner & Dugas, 2006).

The limited research exploring the relationship between problem-solving and worry in non-clinical samples suggests that, although worry intensity appears to be strongly related to negative problem orientation, worry intensity is not related to knowledge of problem-solving skills (Dugas et al., 1995; Dugas et al., 1997). Research suggests that negative problem orientation overlaps to some extent with personality characteristics such as pessimism, low self-mastery and neuroticism (Chang & D’Zurilla, 1996; Clark, Watson & Mineka, 1994). However, in a study conducted in a non-clinical sample, Robicaud and Dugas (2005b) found that the relationship between worry intensity and negative problem orientation was largely independent of pessimism, self-mastery and neuroticism. This would tend to suggest that worry intensity is specifically related to negative problem orientation and not to wider personality traits such as pessimism.

Research using clinical samples appears to support the independence of problem orientation and problem-solving skills with regard to worry intensity. Dugas et al. (1998) and Ladouceur et al. (1998) found that, although individuals suffering from GAD and non-clinical controls reported similar knowledge of problem-solving skills, the individuals suffering from GAD tended to be more negative in their problem orientation than the controls. Ladouceur et al. (1999) compared the problem orientation of individuals diagnosed with GAD to that of individuals suffering from other anxiety disorders and to that of non-clinical controls. Both the GAD group and anxiety disorder group (excluding GAD) reported more negative problem

orientations than the non-clinical controls did. However, individuals suffering from GAD reported a more negative problem orientation than the individuals diagnosed with other anxiety disorders did (Ladouceur et al., 1999). In another study, Dugas et al. (2005) compared the problem orientation of individuals suffering from GAD to individuals suffering from panic disorder. This study revealed that negative problem orientation was significantly related to worry, but unrelated to panic disorder symptoms. Thus, there would appear to be some evidence to suggest that negative problem orientation is more common in clinically anxious individuals than in non-anxious controls. Furthermore, at least two studies suggest that individuals suffering from GAD can be distinguished from individuals suffering from other anxiety disorders based on negative problem orientation.

3.4.3.4 Cognitive avoidance

Two distinct forms of cognitive avoidance have been identified. The first is implicit cognitive avoidance, which refers to implicit, automatic strategies employed in an attempt to avoid threatening mental imagery and the accompanying distressing somatic arousal. The second form of cognitive avoidance involves the use of explicit or voluntary strategies such as suppression, distraction and thought replacement in an attempt to suppress unwanted thoughts or avoid triggers that may lead to worrisome thinking (Dugas & Robichaud, 2007).

A study conducted by Borkovec and Inz (1990) appears to suggest that worry in GAD is predominantly thought-based rather than imagery-based, while Freeston et al. (1996) demonstrated that excessive worriers reported higher thought-to-image ratios than participants who were classified as ordinary worriers. These findings tend to suggest that excessive worry, even outside the context of GAD, appears to be a predominantly verbal-linguistic process. Borkovec et al. (1998) suggest that the primarily abstract, verbal-linguistic nature of worry (Borkovec & Inz, 1990; Freeston et al., 1996) provides a basis for the emotional inhibitory functions of worry (Borkovec et al., 2004; Borkovec & Inz, 1990; Laguna et al., 2004). The findings of two studies among speech-phobic participants (Borkovec & Hu, 1990; Hazlett-Stevens & Borkovec, 2001) suggest that worry is a form of cognitive avoidance that suppresses somatic/physiological responses to threatening stimuli, but does so at the expense of effective emotional processing.

Several studies seem to support the utilisation of explicit cognitive avoidance strategies to avoid threatening thoughts and images in the contexts of GAD and excessive worry. Ladouceur et al. (1999) found that individuals suffering from GAD reported engaging in thought suppression more frequently than non-clinical controls. Similarly, Dugas et al. (1998) found that individuals diagnosed with GAD could be reliably discriminated from non-clinical controls based on the frequency with which they reported engaging in thought suppression. Literature on cognitive avoidance indicates that, in addition to thought suppression, three other cognitive avoidance strategies may be employed by individuals prone to engaging in excessive worry. These are substituting neutral or positive thoughts for worries, using distraction as a way to interrupt worry and avoiding situations that can lead to worrisome thinking. These three cognitive avoidance strategies have been shown to be independently related to excessive worry in non-clinical samples in at least two studies (Sexton & Dugas, 2004; Sexton, Dugas & Hedayati, 2004). In addition, cognitive avoidance appears to be more strongly related to excessive worry than to other anxiety-related cognitions and symptoms. Dugas et al. (2005) found that cognitive avoidance was significantly correlated to excessive worry, but that no significant correlation existed between cognitive avoidance and symptoms of panic disorder with agoraphobia.

Literature on the efficacy of cognitive avoidance strategies in suppressing distressing thoughts and images appears to be limited to studies on the effects of thought suppression. Furthermore, this literature seems inconclusive. With regard to the efficacy of cognitive avoidance to suppress threatening thoughts and images, only literature regarding thought suppression could be found. Thought suppression has been found to produce paradoxical effects on threatening thoughts and images when individuals suffering from GAD try to suppress their worries (Purdon, 1999). The findings of a study by Becker et al. (1998) suggest that thought suppression is ineffective in reducing the duration of worry episodes among individuals suffering from GAD, as well as among individuals with speech phobia and non-anxious controls. Similarly, Mathews and Milroy (1994) found that thought suppression had no effect on the duration of worry experienced by high or low worriers. However, McClean and Broomfield (2007) report that, after suppressing a chosen worry for a week, high worriers spent less time thinking about the specific worry that they had been suppressing, while reporting a significant increase in worry controllability. More applied research on the effects of cognitive avoidance strategies appears warranted. The efficacy of thought suppression as a

strategy for controlling worry appears questionable. However, more research on the effects of suppressing thoughts on worry is warranted.

In conclusion, these studies appear to suggest that individuals suffering from GAD use implicit cognitive avoidance strategies such as the automatic avoidance of threatening mental images, as well as a number of explicit or voluntary cognitive avoidance strategies in an attempt to control their worries.

3.4.3.5 Empirical evidence for the intolerance of uncertainty model

Each of the individual elements of the intolerance of uncertainty model, as they relate to worry, appears to have been the subject of empirical investigation. However, relatively few studies have included all four elements of the intolerance of uncertainty model. Notwithstanding, studies that have incorporated all four elements of the model have demonstrated significant relationships between each variable of the intolerance of uncertainty model and worry (Dugas et al., 1998; Dugas et al., 2005; Dugas et al., 2007; Ladouceur et al., 1998; Laugesen, Dugas, & Bukowski, 2003; Robichaud et al., 2003).

Ladouceur et al. (1998) found that individuals suffering from GAD reported more negative problem orientation, more cognitive avoidance, higher levels of intolerance of uncertainty and more positive beliefs about worry than non-clinical controls. Furthermore, Dugas et al. (1998) demonstrated that intolerance of uncertainty, positive beliefs about worry, cognitive avoidance, and negative problem orientation distinguish individuals suffering from GAD from non-clinical controls. Dugas et al. (2005) found that intolerance of uncertainty, cognitive avoidance, positive beliefs about worry and negative problem orientation were significantly related to worry. Moreover, this study demonstrated that clinically anxious participants could be distinguished from non-clinical controls based on the four main components of the intolerance of uncertainty model (Dugas et al., 2005). However, among the clinical participants in the study, only intolerance of uncertainty was found to be specifically characteristic of the individuals suffering from GAD compared to the other clinically anxious participants. Dugas and colleagues (2007) tested the ability of the intolerance of uncertainty model to predict the severity of GAD symptomatology in a sample of individuals diagnosed with GAD. The results of this study demonstrated that intolerance of

uncertainty, cognitive avoidance, positive beliefs about worry and negative problem orientation all accurately predicted the severity of GAD symptomatology (Dugas et al., 2007). It is interesting to note, however, that intolerance of uncertainty demonstrated the strongest predictive value of the four components of the model.

Research literature suggests that a relationship exists between all four components of the intolerance of uncertainty model and worry. However, intolerance of uncertainty demonstrates a stronger relationship to worry than the other three components of the model (Dugas et al., 1998) and also more accurately predicts the severity of GAD symptomatology than the other three components of the model do (Dugas et al., 2007). Moreover, significant correlations between intolerance of uncertainty and the other three variables of the intolerance of uncertainty model have been reported (Dugas et al., 1998; Laugesen et al., 2003; Dugas et al., 2005). Thus, it would appear that intolerance of uncertainty may well be the predominant element in the model and may also underpin or influence the other components of the model, as suggested by Dugas and co-workers (Dugas et al., 2007).

3.4.4 Summary

Studies using non-clinical and clinical samples generally seem to provide empirical support for several aspects of the intolerance of uncertainty model. First, intolerance of uncertainty appears to demonstrate a strong relationship with symptoms of GAD, in particular with excessive worry. Furthermore, research from a number of clinical and non-clinical studies in the area of positive beliefs about worry indicates that a relationship exists between the intensity of worry and beliefs held regarding the positive functions and/or consequences of worry. It is also apparent from the literature that there is evidence supporting a relationship between negative problem orientation and worry in both clinical and non-clinical samples. Literature reviewed also seems to suggest that implicit and explicit cognitive avoidance strategies contribute to excessive worry.

It would appear from the available research that all four components of the intolerance of uncertainty model accurately predict the severity of GAD symptomatology. Moreover, intolerance of uncertainty appears to be the strongest single predictor of the severity of GAD symptomatology. It has also been demonstrated that, of all the components of the model in

both clinical and non-clinical samples, intolerance of uncertainty is the most salient predictor of worry intensity. Finally, significant correlations between intolerance of uncertainty and the remaining three variables of the intolerance of uncertainty model are also reported in the literature. This lends some support to the assertion that intolerance of uncertainty is the primary cognitive bias underlying the development and maintenance of excessive worry, as well as supports the notion that intolerance of uncertainty exerts an influence on positive beliefs about worry, cognitive avoidance and negative problem orientation.

3.5 CONCLUSION

Three models of worry have been reviewed in this chapter, starting with the avoidance model of worry and GAD proposed by Borkovec and colleagues (Borkovec et al., 1998). This model suggests that worry is primarily a verbal-linguistic, thought-based activity and represents an effort aimed at the avoidance of anticipated negative outcomes. Thus, worry functions as a cognitive avoidance strategy in response to perceived threats. The process of worrying is hypothesised to be reinforced both by the immediate suppression of somatic/physiological responses to threatening stimuli and by the fact that the majority of negative outcomes that individuals worry about never seem to occur. Worrying about a particular topic may also function to distract an individual from more distressing topics. However, worry, via its avoidant function, seems to result in the prevention of effective emotional processing of the threat stimulus. In turn, this results in an elevation in anxiety symptoms and an increased tendency to engage in excessive worry when the individual is confronted with potentially threatening images and thoughts in the future. Literature appears to offer empirical support for the major components of the avoidance model of worry and GAD, and for their individual relationships to worry and GAD. However, no studies appear to have focussed on the model as a whole, or on the interaction between the major components of the model.

The metacognitive model of GAD (Wells, 1995) was also reviewed in this chapter. The metacognitive model of GAD proposes that worry becomes excessive and chronic primarily as a function of the metacognitive beliefs that individuals suffering from GAD hold with regard to the importance of worry. Initially, worry is reinforced by positive metacognitive beliefs that individuals hold about worry as an effective means of coping with threatening

images or thoughts (Type 1 worry). This results in worry being employed more frequently as a means of coping. However, individuals suffering from GAD also have been found to hold various negative metacognitive beliefs about worry. These negative metacognitive beliefs generally concern the danger of worry and the importance of the need to control worry (Type 2 worry). Negative metacognitive beliefs result in an increased occurrence of threatening intrusive images and thoughts, thus resulting in the increased use of worry as a coping mechanism and, in turn, to an increased frequency and/or intensity of negative metacognitive beliefs. This cycle is hypothesised to underlie the excessive and uncontrollable worry that is characteristic of GAD. Generally, empirical literature provides support for individual components of the model and their relationship to worry and GAD. However, while some evidence suggests that the components of the model are related to one another, there appears to be little evidence with regard to directionality or causality in these relationships.

Finally, the intolerance of uncertainty model (Dugas et al., 1998) was reviewed. This cognitive-behavioural model of GAD underscores the role of intolerance of uncertainty in the development and maintenance of GAD. In addition to intolerance of uncertainty, this model highlights the role of beliefs about the usefulness of worry, negative problem orientation and cognitive avoidance in the development of excessive worry in GAD. The intolerance of uncertainty model proposes that worry cycles are triggered by either internal or external events. These triggers frequently give rise to intrusive thoughts that initiate a chain of future-oriented and uncertainty-related thoughts. Worry cycles are maintained by beliefs that worry is beneficial in dealing with situations that are ambiguous or situations where the outcome is uncertain. In turn, both negative problem orientation and cognitive avoidance are hypothesised to feed back into the cycle of uncertainty and ambiguity by giving rise to additional "what if?" questions or promoting the cyclical nature of such thinking. This process results in the excessive and recurrent worry that is characteristic of GAD. Empirical literature provides some evidence for all four major components of the intolerance of uncertainty model. Furthermore, significant positive correlations between intolerance of uncertainty and the other three components of the model have been reported. This appears to support assumptions that intolerance of uncertainty is the primary construct in this model and that intolerance of uncertainty ties the other components of the model together. However, to date, no research appears to have established directionality or causality in the correlations between intolerance of uncertainty and the other components of this model.

4 RACE, CULTURE AND ETHNICITY

4.1 INTRODUCTION

The effects of ethnicity and culture on the presentation of psychopathology and on the efficacy of therapeutic interventions have been an area of concern in therapeutic psychology for some time. Regulatory and professional bodies encourage their members to remain aware of the possible influence of culture and ethnicity in their interaction with clients from backgrounds different from their own. The guidelines of the American Psychological Association (APA, 2003) for working in a multi-ethnic context encourage psychologists to "recognize that, as cultural beings, they may have attitudes and beliefs that can detrimentally influence their perceptions of, and interactions with individuals who are ethnically different from themselves" (p. 382). Practitioners are also cautioned to "recognize the importance of multicultural sensitivity/responsiveness, knowledge, and understanding about ethnically and racially different individuals" (APA, 2003, p. 385). The APA (2003) also encourages researchers to ensure that their research remains relevant by attempting to "recognize the importance of conducting culture-centred and ethical psychological research among persons from ethnic, linguistic, and racial minority backgrounds" (p. 388).

The need for multi-ethnically relevant systems of diagnosis and modes of treatment delivery appears to be widely recognised. Various authors highlight how important knowledge of ethnic differences is to diagnose and treat people from different cultural backgrounds (Barlow, 2002; Flaskerud, 2000; Friedman, 2001; Scott et al., 2002). The manner in which culture may influence how individuals exhibit psychological distress or seek help for psychological difficulties is also emphasised (Eshun & Gurung, 2009; Tanaka-Matsumi, 2001). Similarly, the need for clinicians to consider ethnicity when working with people from cultural minorities is well-documented (APA, 2003; Bernal & Sáez-Santiago, 2006; Sue & Zane, 1987). However, a review of the relevant literature suggests that, while the importance of developing ethnically and culturally sensitive diagnostic systems and forms of therapy is often mentioned, research addressing the mechanisms underlying many forms of psychological dysfunction across ethnicity and culture is extremely sparse.

The aim of the current study is to examine the applicability of the avoidance model of worry and GAD (Borkovec et al., 1998), the metacognitive model of GAD (Wells, 1995) and the intolerance of uncertainty model (Dugas et al., 1998) for explaining excessive worry in a multi-ethnic context. Consequently, it is necessary to review the relevant literature pertaining to ethnicity and multi-ethnicity as it relates to the study of cognitive processes underlying emotional dysfunction in general and worry in particular. To this end, this chapter will first attempt to define ethnicity in the context of the present study. Second, available literature on ethnicity and anxiety will be reviewed. Third, this chapter will attempt to provide a review of literature on worry, GAD and ethnicity.

4.2 DEFINING ETHNICITY

Understanding the potential contribution of race, ethnicity and culture to the experience and expression of emotional distress necessitates clarification of these terms. The criteria generally used to make group distinctions tend to be based on cultural and/or biological factors. Moreover, the concepts of race, ethnicity and culture are often used interchangeably when differentiating between groups of people. The interchangeable use of these terms may often limit understanding of the complex ways in which individuals from different backgrounds experience and express emotion. Thus, defining exactly what is meant by race, ethnicity and culture is a necessary step toward formulating a conceptualisation of group difference to provide the context in which the three models of worry can be tested meaningfully.

The term race is generally used in two ways: biologically and socio-culturally. Traditionally, the term was used to describe an individual's biologically determined characteristics (Beutler, Brown, Crothers, Booker & Seabrook, 1996; Centers for Disease Control [CDC], 1993; Kaufman & Cooper, 1995). Biological definitions of race tend to focus on shared physical and genetic characteristics such as skin colour, hair texture and eye colour (Beutler et al., 1996; CDC, 1993; Eshun & Gurung, 2009; Kaufman & Cooper, 1995). However, biological classifications of race have been challenged. Various authors suggest that, in reality, although conceptualisations of race focus on physical characteristics, they are actually constructed socially (Littlefield, Lieberman & Reynolds, 1982; Relethford, 2002; Smedley & Smedley,

2005). Littlefield et al. (1982) note that, aside from basic physical characteristics, few racial differences have been found to be attributable purely to genetics. More recently, Smedley and Smedley (2005) proposed that the generally accepted sociocultural conceptualisation of race appears to describe human differences through a combination of physical features and behaviour. Mio, Barker-Hackett and Tumambing (2006, p. 9) express a similar view when they define race as "the perspective that characteristics, values, and behaviours that have been associated with groups of different physical characteristics serve the social purpose of providing a way for outsiders to view another group and members of a group to perceive themselves". Thus, it would appear that, while the concept of race does not seem to be genetically distinct or scientifically meaningful, the term holds significant social implications for how people treat one another (Eberhardt, 2005). However, it is doubtful that a conceptualisation of sameness and difference based exclusively on physical characteristics would provide a sufficiently complex context in which to study variations in emotion and cognition across groups of individuals meaningfully.

Culture appears to be a complex multidimensional concept (Eshun & Gurung, 2009; Friedman, 2001). Initially, culture was conceptualised and defined within the field of anthropology. Linton (1945) suggests that culture is "a configuration of learned behaviours and results of behaviour whose component elements are shared and transmitted by members of a particular society" (p. 32). According to Flaskerud (2000), culture refers to a "learned system of values, beliefs, meanings, rules, and practices that are passed on from one generation to the next in patterned ways" (p. 7). Another definition suggests that culture should be regarded as "the set of distinctive spiritual, material, intellectual and emotional features of society or a social group, and that it encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs" (UNESCO, 2002, p. 1). The preceding definitions place particular emphasis on the specific nature of the similarities that groups share. In contrast to the perspective offered by biologically based classifications of group membership, these definitions focus specifically upon social behaviour, social interactions, and shared beliefs and conceptual systems. A cultural perspective on group membership could be viewed as individuals who share a set of beliefs, traditions and values as similar or belonging to the same group, while individuals who do not share these would be viewed as different or from another group. Biologically based similarities may influence the extent to which these individuals are similar, but it is not

viewed as the primary determinant of their relatedness. Furthermore, the continuation of group identity from one generation to the next is considered the result of the generational transfer of culture rather than being determined by genetic and physical conformity.

Ethnicity usually refers to a group of individuals who identify with one another and share a sense of belonging through a common heritage. In contrast to race, which is premised on biologically determined group membership, the concept of ethnicity proposes that group membership can be determined on the basis of nurture, a common culture and shared historical experiences. According to Flakerud (2000), ethnicity is based on "a shared sense of peoplehood related to national or regional origin and sometimes on shared language, religion, and customs" (p. 7). Eshun and Gurung (2009) suggest that an ethnic group refers to "a group of people with common ancestry, who often have similar physical and cultural attributes, such as language, physical features, rituals and norms" (p. 8). Consequently, ethnicity seems to refer to a categorisation of a group of people considered to be significantly different from others in terms of selected cultural (e.g. language, traditions) and sometimes physical features (e.g. facial characteristics, skin colour). It is also apparent that ethnicity encompasses the commonalities of belief, behaviour and social interaction that are characteristic of definitions of culture. Thus, much like race, ethnicity makes provision for the biological similarities that are often shared by specific groups. However, ethnicity provides a wider conceptualisation of sameness and difference than race does, in that it also emphasises the cultural, experiential and historical basis for group membership or group identity.

A wide variety of criteria may be used to draw distinctions between individuals of different physical appearance and from differing backgrounds. The applicability of each of these criteria to the current study could be viewed as dependent upon the extent to which each perspective is able to account for the diversity that is evident in contemporary South African society. With a population of 49 million people, South Africa consists of four broad ethnic groupings (79% black, 9.6% white, 8.9% coloured and 2.5% Indian) that speak 11 official languages characterised by diversity (The Central Intelligence Agency, 2009). Moreover, in addition to language, individuals are also frequently categorised according to their physical appearance or race. In this respect, the country's population is most often divided into black, Caucasian, coloured (individuals of mixed Caucasian and black or Caucasian and Malay

heritage) and Indian (this category usually includes all individuals originating from the Indian subcontinent). In addition to this racially based classification, the South African population also reflects numerous cultures and subcultures. For example, within the broader grouping of black individuals, a distinction can be drawn between Nguni (predominantly Xhosa and Zulu) and Sotho (predominantly Sesotho and Setswana) cultures (Country Studies US, 2010). It would thus appear that, in the South African context, individuals are commonly distinguished from one another by physical appearance and origin (race), as well as by culture (language, belief systems, social practices etc.). Consequently, any meaningful conceptualisation of the differences that exist between groups in South Africa has to consider both race and culture. However, this conceptualisation should not be constrained by these concepts. Thus, it appears that the term ethnicity, which includes ideas of a common ancestry, similarities in physical appearance and cultural commonalities as a basis for individuals identifying with one another as a group, as well as being identified as a group by others (Eshun & Gurung, 2009), is the most applicable conceptualisation of sameness and otherness in the current South African context. Consequently, the current study will make use of the term ethnicity in preference to terms such as race and culture.

Having established ethnicity as an appropriate framework for labelling and understanding intra-group variability as it pertains to psychological research in South Africa, it becomes necessary to define and specify the terminology that will be used to refer to different ethnicities in the current study. It has been stated previously that ethnicity encompasses more than physical attributes such as skin colour. However, given South Africa's political history of segregation based on race, many cultural and social differences have been entrenched along racial lines. Consequently, it is often very difficult to separate culture (transferred via common experiences of the apartheid system) and social experiences (education, access to health care etc.) from race. Thus, the reality of South African society appears to be that, largely, ethnicity can still be expressed in terms of racial groupings (Bureau of African Affairs, 2010; Coplan, 2010; Country Studies US, 2010). Caucasians, despite language and some cultural differences, appear to have more in common with one another with regard to social and cultural experiences than they would with black or Indian South Africans. Similarly, despite tribal and cultural differences, black South Africans would be expected to relate more closely to a black identity forged by common experiences of the social realities of apartheid and post-apartheid South Africa (Bureau of African Affairs, 2010; Coplan, 2010;

Country Studies US, 2010). It thus appears that, in the context of the current study, a black-Caucasian division may be the most pragmatic way to determine ethnicity. Moreover, given the apparent dearth of local research on ethnicity and cognitive variables and processes involved in regulating emotion, it appears necessary to first attempt to answer research questions at a meta-ethnic level before attempting to refine findings by investigations that are more nuanced in more specifically defined ethnic and/or cultural groups.

4.3 ANXIETY DISORDERS AND ETHNICITY

Similar prevalence rates for anxiety disorders have been reported internationally (Barlow, 2002; Holaway et al., 2006). The prevalence of GAD and panic disorder reported in Lesotho is similar to the prevalence of these disorders in North America (Hollifield et al., 1990). The prevalence of GAD seems to be similar in America (Wang et al., 2000), Germany (Carter et al., 2001) and Australia (Hunt et al., 2002). Prevalence rates for panic disorder are comparable in America, Canada, Puerto Rico, New Zealand, and Korea (Horwath & Weissman, 1997). In addition, prevalence rates of obsessive-compulsive disorder (OCD) have been reported as similar among people from different countries and ethnic backgrounds (Barlow, 2002; Canino et al., 1987; Karno, Golding, Sorenson & Burnam, 1988; Weismann et al., 1994). Furthermore, according to Brown, Shear, Schulberg and Madonia (1999), the prevalence of anxiety disorders seems to be similar among individuals from Western and non-Western backgrounds.

The preceding discussion seems to suggest that anxiety disorders are similarly prevalent across nationality and ethnicity. However, according to Rego (2009), although anxiety disorders appear to occur at similar rates internationally, ethnicity and culture appear to influence the expression of anxiety in individuals from different ethnic backgrounds. Similarly, Lewis-Fernández and colleagues (2010) note that while anxiety disorders can be identified in all societies, the prevalence and presentation of these disorders vary internationally. These authors also draw attention to what they describe as "substantial cultural particularities" (Lewis-Fernández et al., 2010, p. 213) in the prevalence and manifestation of anxiety disorders globally. These findings correspond to existing literature regarding ethnic differences in the manifestation of anxiety disorder symptomatology. Much

of this literature appears to focus on the tendency for individuals from non-Western societies to present with more anxiety-related somatic symptoms and fewer cognitive symptoms of anxiety (Barlow, 2002; Eshun & Gurung, 2009; Rego, 2009). More recent epidemiological anxiety research appears to support the view emphasised by cross-cultural approaches to psychological distress that the way in which people label their reactions is "dependent on their social reality and is different in significant ways across cultures" (Friedman, 2001, p. 38). The ensuing review will attempt to highlight the specific manner in which ethnicity and culture may affect the experience and presentation of specific anxiety disorders.

According to Rego (2009), social phobia or social anxiety disorder (SAD) is one of the most prevalent anxiety disorders worldwide. However, while SAD appears to be highly prevalent in Western societies, it seems rather less prevalent in non-Western societies. In this regard, Lewis-Fernández et al. (2010) state that it is not clear whether differing prevalence rates of SAD reflect genuine differences in the occurrence of the condition or are the result of a lack of truly cross-culturally valid diagnostic criteria. Specific questions regarding the universality of SAD diagnoses revolve round Western and Oriental societies. Okazaki (1997) investigated potential sources of ethnic differences in social anxiety among Asian-American and American students of European origin. The Asian-American participants in this study scored significantly higher than the American participants of European origin did on measures of social anxiety. Moreover, the Asian-American participants reported significantly lower levels of independent self-construal and higher levels of interdependent self-construal compared to the Americans of European origin. An increased tendency toward interdependent self-construal, as exhibited by the Asian-American participants, thus appears to be associated with an increased incidence of SAD (Okazaki, 1997). The author of the study hypothesises that individuals from cultures that emphasise conformity and consideration of others may be more inclined toward making interdependent self-construals and, therefore, be more inclined to become socially anxious. This hypothesis is confirmed to some extent by clinical observations regarding the tendency for certain Japanese and South Korean individuals suffering from SAD to be concerned more with causing embarrassment to another person than with being evaluated negatively or embarrassed themselves (Lewis-Fernández et al., 2010).

Heinrichs et al. (2006) investigated ethnic differences in perceived social norms and social anxiety across eight countries (Australia, Canada, the Netherlands, Germany, Japan, Korea, Spain and America). The findings demonstrate different patterns of reaction toward socially reserved individuals between the collectivist (Japanese, Korean and Spanish) and the individualistic (Australian, Canadian, Dutch, German and American) societies (Heinrichs et al., 2006). Individuals in countries with values that are more collectivist were found to be more accepting toward socially reserved and withdrawn behaviours, while extraverted behaviours tended to be received more positively in the countries that tended to value individualism (Heinrichs et al., 2006). However, the study also found that participants from collectivist societies reported higher frequencies of social anxiety compared to individuals from societies that were more individualistic. A possible explanation for these findings offered by Heinrichs and colleagues (2006) is that social harmony and conformity particularly are valued in collectivist societies. As a result, these societies tend to have strict guidelines with regard to what constitutes appropriate behaviour in various situations. Therefore, it may be very important for individuals in collectivist societies that their behaviour be evaluated as acceptable and socially appropriate. Consequently, individuals in collectivist societies may focus more acutely on the social appropriateness of their behaviour and thus be more inclined to experience a heightened sense of social evaluation characteristic of social anxiety. In societies that are more individualistic, where what is considered appropriate social interaction is not as strictly prescribed, individuals may focus less on others' evaluation of their behaviour and be guided more by personal standards of appropriateness. As a result, these individuals may be inclined to experience lower levels of self-consciousness in social interactions (Heinrichs et al., 2006).

Mahgoub and Abdel-Hafeiz (1991) suggest that, while the prevalence of OCD in Saudi Arabia is comparable to that reported in other parts of the world, the content of the obsessions experienced by Saudis and the nature of the compulsions in which they engage may differ from those reported in some other societies. All thirty-two participants in their study who met the diagnostic criteria for OCD exhibited obsessions primarily related to religious practices, specifically prayer and the washing rituals that accompany prayer in the Islamic tradition. Given that religious themes are generally less common in OCD-related obsessions and compulsions reported in a number of other countries, Mahgoub and Abdel-Hafeiz (1991) conclude that the differences in the content of obsessions and the nature of compulsions that

were apparent between the participants in their study and OCD sufferers from other, non-Muslim countries may be partly attributable to their religious orientation.

In a similar vein, Yorulmaz, Gençöz and Woody (2009) investigated the relationship between religiosity and OCD-related symptoms and cognitions in different religious contexts. These authors collected data related to OCD symptomatology and religiosity in a sample of Turkish Muslims and Canadian Christians. An analysis of this data revealed that, regardless of their religious orientation, deeply religious individuals reported experiencing more obsessive thoughts and engaged in more frequent checking behaviour than individuals who reported to be less religious (Yorulmaz et al., 2009). Consequently, the intensity or frequency of OCD symptomatology appears to be associated with how religious an individual is and not with a specific religious orientation per se. However, the Muslim participants generally tended to report a greater number of OCD symptoms than the Christian participants. The Muslim participants were also inclined to be more concerned about their thoughts and controlling them, as well as more likely to engage in worry as a strategy to manage intrusive thoughts (Yorulmaz et al., 2009). The authors of the study hypothesise that, since Islam is a more ritualistic religion than Christianity with greater emphasis on pre-defined behavioural requisites, the differences that were observed between the two groups with regard to the number of OCD symptoms and the employment of thought-control strategies could possibly be ascribed to the inherent characteristics of the two religions. However, the authors of the study caution that the participants were drawn from different countries with different cultures. Consequently, the differences observed in this study between Turkish Muslims and Canadian Christians could possibly be attributed to general ethnic and cultural differences and may thus not be completely attributable to religious orientation as such (Yorulmaz et al., 2009). Nonetheless, this study demonstrates the influence that factors such as religious orientation and cultural values can have on the expression of OCD, as well as on associated compensatory cognitive processes such as worry and thought control.

It seems apparent from the literature reviewed above that, at least tentatively, differences in the prevalence of SAD and OCD can be associated with ethnic and cultural differences that occur between certain societies and groups. There also seems to be an increasing realisation that, while anxiety appears to be a universal human experience, predominantly western systems of diagnosis may not provide valid or relevant frameworks for conceptualising

anxiety disorders across countries and ethnicities (Lewis-Fernández et al., 2010). Thus, the need for a clearer understanding of not only ethnicity-specific presentation of anxiety disorders, but also the specific manner in which cognitive processes underlying anxiety disorders may differ across ethnicities is apparent. To this end, the next section of this chapter will review the available literature on GAD, worry and ethnicity.

4.4 GAD, WORRY AND ETHNICITY

Epidemiological literature on anxiety suggests that GAD occurs in most societies across the world (Maier et al., 2000). However, prevalence rates vary from one society to another. In the USA, the estimated 12-month prevalence of GAD is 2.1%, while lifetime prevalence is estimated at 4.1% (Grant et al., 2005). These estimates are very much in keeping with the prevalence rates reported in the DSM-IV-TR (APA, 2000). Twelve-month prevalence of GAD in Germany is reported at 1.5% (Carter et al., 2001). The prevalence of GAD in Australia seems to be somewhat higher than the rate reported in the DSM-IV-TR, with 12-month prevalence rates reported at 3.6% for the general population (Hunt et al., 2002), while 12-month prevalence rates in Japan appear considerably lower at 1.2% (Kawakami et al., 2005). The 12-month prevalence rate for GAD in South Africa (1.4%) is below the rates reported in the DSM-IV and those reported for various western countries (Williams et al., 2008). Thus, while GAD appears to occur in all the countries mentioned above to some degree, differences in 12-month prevalence rates are apparent. Moreover, differences in the prevalence of GAD have also been reported between different ethnicities in the same country (Breslau et al., 2006; Himle, Baser, Taylor, Campbell & Jackson, 2009). The prevailing trend in literature on the prevalence of GAD is perhaps best summarized by Lewis-Fernández and colleagues (2010, p. 223) when they state, "Non-Western samples (i.e. Asian, African, indigenous) tend to show lower rates of GAD than individuals of European descent, and this pattern is reproduced in an attenuated form among racial/ethnic minorities in the United States (especially among less acculturated subgroups)."

The differences in prevalence of GAD reported above could be interpreted as purely a reflection of varying degrees of GAD in these countries or among ethnicities in the same country. However, some authors suggest that variations in the prevalence of GAD and other

anxiety disorders from one ethnic group to the next may be due to the manner in which individuals from different ethnic backgrounds present with anxiety and the degree to which these clinical presentations approximate the typologies upon which formalised diagnostic systems like the DSM are based (e.g. Lewis-Fernández, et al., 2010). Certain ethnic groups are considered to be more inclined to experience and thus report anxiety symptoms as primarily somatic, while it is believed that individuals from other ethnic backgrounds are more inclined to report their anxiety in terms of cognitive symptoms. This is borne out in a study conducted by Hoge et al. (2006), which revealed that Nepalese GAD sufferers were inclined to report significantly more somatic symptoms than their counterparts in the USA did. American participants, on the other hand, tended to report higher frequencies of cognitive symptoms. Thus, it seems that ethnicity may influence the clinical presentation of GAD. More specifically, ethnic differences in predominantly somatic versus predominantly cognitive presentations of anxiety may be particularly relevant to GAD, where prolonged and excessive worry (a cognitive phenomenon) is considered the hallmark of the disorder. It is also interesting to note that the majority of doubts expressed with regard to the cross-ethnic validity of the DSM-IV-TR typology of GAD tend to revolve round worry. More specifically, authors have questioned the validity of the requirement that worry be excessive (Ruscio et al., 2005) and uncontrollable (Diaz, 2000), as well as prescripts with regard to the duration of worry (Lee et al., 2009). The consistency of the content and number of worry domains across ethnicities has also been queried (Scott et al., 2002). Thus, there appears to be a need for additional research on ethnicity and the cognitive symptoms of GAD, most specifically worry.

Initially, research interest in worry was closely related to the role that worry played in GAD. More recently, worry has come to be viewed as an independent construct deserving empirical attention. However, despite this increased interest in worry and the subsequent development of models attempting to explain the development and maintenance of excessive worry, the possible influence of ethnicity appears to have enjoyed less attention. Only a few studies have addressed ethnic differences related to the experience of worry (e.g. Diaz, 2000; Scott et al., 2002; Watari & Brodbeck, 2000). Furthermore, it has been suggested that considerably more research is needed on the nature of worry across ethnicities, particularly in non-clinical samples (Roemer et al., 2002; Scott et al., 2002). The little cross-ethnic research there is on worry outside the context of GAD seems to suggest that no statistically significant

differences in the intensity and frequency of worry are apparent across ethnicities (Gillis et al., 1995; Scott et al., 2002). However, some evidence suggests that ethnic differences are apparent in the content of worry. More specifically, Scott and co-workers (2002) found that African Americans in a non-clinical sample were less inclined to worry about relationships, self-confidence, future goals and their occupational competence than their Caucasian and Asian-American counterparts did. However, all three groups reported similar levels of worry about finances. The authors of this study suggest that current widely used measures of worry may not adequately sample areas of worry that are relevant to African-Americans. Consequently, additional research into ethnic differences in the content of worry appears to be necessary.

The literature reviewed in this section suggests that noteworthy differences in the prevalence of GAD occur across ethnicity. Furthermore, the validity of current DSM diagnostic criteria for GAD has been questioned. More specifically, researchers express doubt with regard to the extent to which the requirements that worry be excessive, uncontrollable and focussed on a variety of life areas can be generalized across ethnicities. Thus, the effect of ethnicity on the experience of worry in GAD is not clear at present. Research suggesting that the content of the worry experienced by individuals in the general population may vary as a function of ethnicity is also limited. Taken together, the literature reviewed above highlights the need for research into ethnic differences in worry, including theoretical explanations of the development and maintenance of excessive worry.

4.5 CONCLUSION

The current study will make use of the term *ethnicity* in preference to terms such as *race* and *culture*. This choice is based largely on the premise that, given the socio-political history of South Africa, cultural differences cannot realistically be viewed independently of race as people from similar racial backgrounds are perhaps more similar to one another with regard to culture than they are to individuals from other racial backgrounds. However, using race as a biologically determined basis for determining group membership, does not provide adequate room for considering cultural and social influences that may affect an individual's experience of psychological distress or influence cognitive and emotional processes widely

believed to be involved in developing and maintaining such distress. Thus as ethnicity appears to make the most provision for considering racially and socially determined commonalities that may differentiate one group from another, this term appears to be the most appropriate to use in the current study.

Literature suggests that anxiety is a common human experience. However, differing prevalence rates are frequently reported for common anxiety disorders across nationalities, societies and even sometimes between cultural groups in the same society. Numerous hypotheses have been advanced in an attempt to explain this phenomenon. These include the possible cultural bias inherent in systematic diagnostic systems such as DSM and ICD, inaccurate and inadequate measurement of anxiety-related constructs and the role of social cohesion on anxiety-related symptomatology. Irrespective of the explanations offered for the apparent ethnically based differences in the prevalence of many anxiety disorders, there seems to be a lack of clear understanding as to how ethnicity affects the experience of anxiety. Furthermore, very little research is available with regard to the effect of ethnicity on the cognitive and emotional processes widely hypothesised to facilitate the development and maintenance of anxiety. Consequently, cross-ethnic research into anxiety and anxiety related processes such as worry appears warranted. More specifically, there is a need for research in truly multi-ethnic societies such as South Africa to pay particular attention to the applicability of theories and models formulated in Western societies to the local context.

5 METHODOLOGY

5.1 INTRODUCTION

The research methodology adopted in the present study will be discussed in this chapter. First, the overarching aim of the current study will be stated and research questions derived from the broader aim of the study will be formulated. Second, demographic data related to the gender and ethnic composition of the sample will be presented. Third, a brief discussion of the measuring instruments used in this study will be undertaken. Fourth, the specific data-collection procedures employed in this study will be reviewed. Given that the University of the Free State (UFS) is a parallel-medium institution offering instruction in both English and Afrikaans, it was deemed necessary to translate the questionnaires used in this study into Afrikaans. The internal consistency data for the translated versions of the questionnaires and for the original English versions are reported in the discussion on the research procedures. Finally, the specific statistical procedures used to address the research question(s) will be reviewed.

5.2 AIM AND RESEARCH QUESTIONS

The aim of this study is to test the applicability of three cognitive models of excessive worry in a non-clinical multi-ethnic sample of university students.

The overarching research aim may be operationalised practically by formulating the following broad research questions:

1. What percentage of the variance in the worry intensity of a non-clinical multi-ethnic sample of university students is accounted for by the components of the three cognitive models of excessive worry independently?
2. Does a combination of the three cognitive models of excessive worry account for a larger percentage of the variance in the worry intensity of a non-clinical multi-ethnic sample of university students than the three models of excessive worry account for independently?

The two central research questions stated above can be further distilled into the following specific research questions:

1. What percentage of the variance in worry intensity is accounted for by the components of the avoidance model of worry and GAD (Borkovec et al., 1998) with regard to the total sample, ethnicity, gender and worry intensity?
2. What percentage of the variance in worry intensity is accounted for by the components of the metacognitive model of GAD (Wells, 1995) with regard to the total sample, ethnicity, gender and worry intensity?
3. What percentage of the variance in worry intensity is accounted for by the components of the intolerance of uncertainty model (Dugas et al., 1998) with regard to the total sample, ethnicity, gender and worry intensity?
4. Does a combination of the three cognitive models of excessive worry account for a greater percentage of the variance in worry intensity with regard to the total sample, ethnicity, gender and worry intensity when compared to the individual amount of variance in worry intensity accounted for by the components of the avoidance model of worry and GAD (Borkovec et al., 1998), the meta-cognitive model of GAD (Wells, 1995), and the intolerance of uncertainty model (Dugas et al., 1998) independently?

5.3 PARTICIPANTS AND PROCEDURES

The current study was approved by the Research Committee in the Department of Psychology at the UFS. In addition, written permission to conduct the study was obtained from the Dean of Students at the UFS. All residences on the Bloemfontein campus of the UFS were invited to participate in the research. In an attempt to encourage participation, a financial incentive was offered to both the male and female residence that yielded the most completed questionnaires per capita. In this manner, a convenience sample of 1224 university students (87.7% undergraduate students) was recruited. The participants varied between 18 and 51 years of age ($\bar{X}=19.77$ years), with a standard deviation of 2.323 years. The frequency distribution of the sample by ethnicity and gender is reported in Table 1.

Table 1

Frequency Distribution of the Sample with Respect to Ethnicity and Gender (N = 1224)

Biographical variables	N	%
Ethnicity:		
Caucasian	613	50.1
Black	611	49.9
Gender:		
Female	709	57.9
Male	515	42.1
Ethnicity/Gender:		
Caucasian female	389	31.8
Black female	320	26.1
Caucasian male	224	18.3
Black male	291	23.8

It is evident from Table 1 that the sample consists of six hundred and eleven (49.9%) black participants and 613 (50.1%) Caucasian participants. Furthermore, 389 (31.8%) Caucasian females, 320 (26.1%) black females, 224 (18.3%) Caucasian males and 291 (23.8%) black males were included in the sample. Females made up 57.9% (709) of the total sample.

Written permission to conduct the study was obtained from the student management committee of each residence that had volunteered to participate in the study. Participants were informed of the aim of the study. They were also assured that all information would be treated as confidential. Thereafter, written informed consent was obtained from all participants prior to their completing the questionnaires (examples of the informed consent forms are included in Appendix A). Participants were given the option of completing the questionnaires either in Afrikaans or English (translation of the questionnaires is discussed in Section 5.5). Questionnaires were completed in the residence common rooms by groups of students ranging from 20 to 50 in number. The researcher was present at each data-collection session to ensure the effective administration of the questionnaires and to deal with any queries that might arise. Each participant was provided with a soft drink upon completion of the questionnaire. Data from the questionnaires were coded by the researcher and imported into SPSS Version 17.0 (SPSS Incorporated, 2009).

5.4 MEASURING INSTRUMENTS

The current study aims to determine the applicability of three cognitive models of worry to the multi-ethnic context. To execute the study, it is necessary to measure worry and the cognitive constructs applicable to the avoidance model of worry and GAD (Borkovec et al., 1998), the meta-cognitive model of GAD (Wells, 1995) and the intolerance of uncertainty model (Dugas et al., 1998). However, most of the available literature on worry draws a distinction between different levels of worry intensity (Ruscio, 2002; Ruscio & Borkovec, 2004). Most commonly, individuals who engage in excessive worry but do not fulfil the diagnostic criteria for GAD are differentiated from individuals who fulfil the criteria for GAD and individuals who do not present with excessive worry or a GAD diagnosis (Ruscio, 2002; Ruscio & Borkovec, 2004). Consequently, as stated in the research questions previously formulated, the present study will aim to test the applicability of the three models of worry and a combined model of worry across differing intensities of worry, as well as across ethnicity and gender.

As mentioned previously, self-report measures of worry intensity and GAD symptomatology were administered to be able to assign the participants to one of three levels of worry intensity, namely low worry, high-worry non-GAD and high-worry GAD (the composition of these worry intensity subgroups is displayed in Table 3 in Chapter 7). Self-report GAD symptomatology was measured using the Generalized Anxiety Questionnaire – IV (GADQ-IV) (Newman et al., 2002), while worry intensity was measured using the Penn State Worry Questionnaire (PSWQ) (Meyer, Miller, Metzger & Borkovec, 1990).

The *Generalized Anxiety Questionnaire -IV* (GADQ-IV) (Newman et al., 2002) is a revised, nine-item; self-report diagnostic measure of GAD symptomatology. The GADQ-IV assesses all the DSM-IV diagnostic criteria for GAD except for the exclusion criteria. Items 1 to 5 sample the presence of excessive and uncontrollable worry, as well as the presence of GAD-related somatic symptoms by eliciting "yes" or "no" responses. Item 6 ("During the last six months, have you been bothered by excessive and uncontrollable worries more days than not?") also requires the participant to endorse either a "yes" or "no" response option. Participants who answer "yes" to item 6 are required to complete the rest of the questionnaire, which includes an item requiring individuals to mark the number of somatic symptoms they

experience, and two items that require individuals to rate the extent to which the somatic symptoms they experience affect their functioning, as well as the extent to which they are worried about these symptoms. Responses to the last two items on the questionnaire are solicited along an eight-point Likert-type scale anchored by "none/no distress" and "severe/very severe distress". Individuals who answer "no" to item 6 are not required to complete the remainder of the questionnaire.

The authors of the GADQ-IV (Newman et al., 2002) recommend a dimensional scoring system that provides an overall index of the severity of GAD with total scores ranging from 0 to 13. Cut-off scores are then used to determine the presence or absence of GAD. A total score of 5.7 or above is suggestive of a GAD diagnosis (Newman et al., 2002). The GADQ-IV has demonstrated adequate test-retest reliability at 2 weeks, and good content validity and adequate construct validity in a non-clinical undergraduate sample (Newman et al., 2002). According to Newman et al. (2002), the skip-out instruction following item 6 in the GADQ-IV negates the use of internal consistency coefficients as a means of determining the internal reliability of the questionnaires. Consequently, Cronbach's α -coefficients were not calculated for the GADQ-IV in the current study.

The *Penn State Worry Questionnaire* (PSWQ) (Meyer et al., 1990) is a widely used, 16-item, self-report questionnaire. The PSWQ assesses the general tendency to worry excessively. It was designed specifically to assess the intensity and excessiveness of worry without reference to the specific content of the worries (Roemer, 2001). Participants rate how "typical" each of the 16 statements is of them on a five-point Likert-type scale anchored by "not at all typical" and "very typical" respectively (Roemer, 2001). The PSWQ yields a single score, which is calculated by summing the responses to all 16 items. Possible scores range from 16 to 80 with higher scores reflecting higher levels of worry (Roemer, 2001).

Individuals suffering from GAD appear to score significantly higher ($\bar{X} = 67.35, SD = 8.12$; $\bar{X} = 62.9, SD = 9.5$) on the PSWQ than non-clinical controls do ($\bar{X} = 28.19, SD = 7.10$; $\bar{X} = 38.2, SD = 9.7$) (Behar, Alcaine, Zuellig & Borkovec, 2003; Dugas et al., 1998). There appears to be consensus in the literature that scores above 62 on the PSWQ can be considered indicative of clinically significant levels of worry (Behar et al., 2003; Fresco, Heimberg, Mennin & Turk, 2002). An 8- to 10-week test-retest reliability of .92 was reported for the

PSWQ (Meyer et al., 1990). Internal consistency coefficients ranging from .86 to .96 were reported in clinical samples (individuals suffering from GAD and mixed anxiety disorder samples), as well as non-clinical samples derived from students and the community (Brown et al., 1992; Gillis et al., 1995; Meyer et al., 1990; Olatunji et al., 2007; Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006; Stöber, 1998).

Variables relevant to the three cognitive models of excessive worry under investigation in the current study were measured with the help of the following commonly used self-report questionnaires:

The *Cognitive Avoidance Questionnaire* (CAQ) (Sexton et al., 2004) is a 25-item, self-report inventory that measures the extent to which individuals are inclined to make use of five specific cognitive avoidance strategies, namely (1) Thought Suppression; (2) Thought Substitution; (3) Distraction; (4) Avoidance of Threatening Stimuli; and (5) Transformation of Images into Thoughts in order to Avoid Distressing Thoughts and Images (Sexton et al., 2004). Response options are presented along a five-point, Likert-type scale ranging from "not at all characteristic of me" to "entirely characteristic of me" (Sexton & Dugas, 2008). The CAQ yields five subscale scores and a total score. The subscale scores are calculated by summing the responses to the items in each subscale, while the total score is derived by summing the responses on all 25 items. Possible scores on the five subscales range from 5 to 25, while total scores can range from 25 to 125. The higher the score achieved on a specific subscale, the more inclined an individual is to make use of that particular cognitive avoidance strategy. The higher the total score on the CAQ, the more likely an individual is to engage in cognitive avoidance in general (Sexton & Dugas, 2008).

Internal consistency coefficients ranging from .73 and .89 were reported for the CAQ subscales in a non-clinical sample of undergraduate university students (Sexton & Dugas, 2008; Sexton et al., 2004). An internal reliability coefficient of .95 has also been reported for the CAQ total score in a non-clinical sample of undergraduate students (Sexton & Dugas, 2008). According to Sexton and Dugas (2008), the CAQ also demonstrated four- to six-week test-retest reliability of .85 in a non-clinical sample of undergraduate university students.

The *Intolerance of Uncertainty Scale* (IUS) (Original French version: Freeston et al., 1994; English translation: Buhr & Dugas, 2002) is a 27-item measure designed to assess the degree to which an individual has difficulty tolerating uncertainty. Items consist of statements that describe how people may react to the uncertainties of life, and response options are presented along a five-point, Likert-type scale anchored by "not at all characteristic of me" and "entirely characteristic of me" respectively. The IUS yields a total score, which is calculated by summing the responses to all 27 items on the questionnaire. The total score of the IUS can range from 27 to 135, with higher scores indicating greater intolerance of uncertainty.

An internal consistency coefficient of .94 was reported for the IUS in a non-clinical sample of university students (Berenbaum, Bredemeier & Thompson, 2008). Five-week test-retest reliabilities of between .74 and .78 have also been reported among non-clinical samples of university students (Buhr & Dugas, 2002; Dugas et al., 1997).

The *Meta-Cognitions Questionnaire 30* (MCQ-30) (Cartwright-Hatton & Wells, 1997) is a shortened version of the original 65-item Meta-Cognitions Questionnaire developed by Cartwright-Hatton and Wells (1997). The MCQ-30 is 30-item, self-report measure of negative metacognitive beliefs and dysfunctional thought monitoring and control strategies. Five metacognitions are sampled by the MCQ-30, namely: (1) Positive Beliefs about Worry; (2) Negative Beliefs about Worry Concerning Uncontrollability and Danger; (3) Low Cognitive Confidence; (4) Belief about Need to Control Thoughts and the Negative Consequences of not doing so in Domains of Superstition, Responsibility and Punishment; and (5) Cognitive Self-consciousness. Response options are presented along a four-point, Likert-type scale with potential responses ranging from "do not agree" to "agree very much" (Wells & Cartwright-Hatton, 2004). The MCQ-30 yields five subscale scores, which are derived by summing the responses to the items included in the specific subscale. Possible subscale scores range from 6 to 24. The MCQ-30 also yields a total score, which is obtained by summing responses across all 30 items. Total scores of the MCQ-30 can range from 30 to 120.

According to Wells and Cartwright-Hatton (2004), the MCQ-30 demonstrates a test-retest reliability of .75 for the total score across an interval of 22-118 days. Furthermore, test-retest reliabilities over the same period range from .59 for the negative beliefs about worry

concerning uncontrollability and danger subscale to .87 for the cognitive self-consciousness subscale. The negative beliefs about worry concerning uncontrollability and danger subscale of the MCQ-30 was found to correlate strongly with measures of excessive worry ($r = .73$) and with measures of trait-anxiety ($r = .69$). Relationships between the negative beliefs about worry concerning uncontrollability and danger subscale and measures of excessive worry (PSWQ) and trait-anxiety were particularly strong ($r = .73$ and $.69$). Internal consistency coefficients ranging from .72 and .93 were reported for the MCQ-30 subscales in a non-clinical sample of university students and health service employees (Wells & Cartwright-Hatton, 2004). Excellent internal consistency has also been reported for the total score ($\alpha = .93$) of the MCQ-30 in the same sample.

The *Meta-Worry Questionnaire* (MWQ) (Wells, 2005) is a 14-item, self-report questionnaire designed to measure the frequency of danger-related metacognition and the belief that individuals have in these danger-related metacognitions. The frequency of danger-related metacognition is measured by seven items that offer response options along a four-point, Likert-type scale ranging from "never" to "almost always". The extent to which respondents believe in the danger-related metacognitions is sampled along a 0-100 analogue scale with the two poles anchored by "I do not believe this thought at all" (0) to "I am completely convinced this thought is true" (100). The scores for both scales of the MWQ are calculated by summing the responses across the seven items of the specific scale. Scores on the frequency scale can range from 7 to 28, with higher scores indicating a higher frequency of danger-related metacognitions. Scores on the belief scale can range from 0 to 700, with higher scores being indicative of a stronger belief in the accuracy of the danger-related metacognitions (Wells, 2005).

Relatively little reliability and validity data on the MWQ seem to be available. However, with regard to convergent validity, Wells (2005) reports significant correlations between both subscales of the MWQ and the meta-worry subscale of the Anxious Thoughts Inventory (AnTI), as well as between both subscales of the MWQ and the negative beliefs about worry concerning uncontrollability and danger subscale of the MCQ-30. High internal consistencies are reported for the frequency ($\alpha = .88$) and beliefs ($\alpha = .95$) scales of the MWQ in a non-clinical sample of undergraduate university students (Wells, 2005).

The *Negative Problem Orientation Questionnaire* (NPOQ) (Robichaud & Dugas, 2005a) is a 12-item, self-report instrument designed to provide a measure of negative orientation towards problems and negative evaluations of one's ability to solve problems effectively. Response options are presented along a five-point, Likert-type scale anchored by "not at all true of me" and "extremely true of me" respectively. The NPOQ yields a total score, which is calculated by summing the responses across all 12 items. Total scores of the NPOQ can range between 12 and 60, with higher scores indicating a more negative orientation toward problems.

Robichaud and Dugas (2005a) report an internal consistency coefficient of .90 for the NPOQ in a non-clinical sample of undergraduate university students. Furthermore, these authors report a test-retest reliability of .80 for the NPOQ in the same sample. With regard to construct validity, the NPOQ was found to be significantly negatively correlated with measures of self-mastery, while displaying significant positive correlations with measures of pessimism and neuroticism (Robichaud & Dugas, 2005b).

The *Thought Control Questionnaire* (TCQ) (Wells & Davies, 1994) is a 30-item, self-report measure designed to measure individual differences in the use of strategies for controlling unpleasant intrusive thoughts. The TCQ consists of five subscales consisting of six items each: (1) Distraction; (2) Social Control; (3) Worry; (4) Punishment; and (5) Re-appraisal (Wells & Davies, 1994). Response options are provided along a four-point, Likert-type scale with responses ranging from "never" to "almost always" (Wells & Davies, 1994). Scores on each scale can range from 6 to 24 and are calculated by summing all responses across the six items of each subscale (the scores of items 5, 8 and 12 are reversed). A total score can be calculated for the TCQ by summing responses across all 30 items (reversing items 5, 8 and 12). The higher the score on any particular subscale, the more inclined an individual is to use that particular cognitive control strategy. The total score of the TCQ can range from 30 to 120, with higher scores indicating a stronger tendency to employ thought control strategies in response to unpleasant intrusive thoughts (Wells & Davies, 1994).

Wells and Davies (1994) report internal consistencies ranging from .64 (Punishment) to .79 (Social Control) for the subscales of the TCQ in a non-clinical sample. Reynolds and Wells (1999) report internal consistencies ranging between .66 (Re-appraisal) and .78 (Distraction) in a clinical sample of individuals diagnosed with depression and/or PTSD. Six-week test-

retest reliabilities ranging from .67 for the Punishment subscale to .83 for the Re-appraisal and Social Control subscales were reported. Test-retest reliability for the total score of the TCQ over the same period was reported at .83 (Wells & Davies, 1994).

The *Why-Worry II Scale* (WW-II) (Holowka et al., 2000) is a 25-item, self-report inventory that assesses five positive beliefs about the usefulness of worry. More specifically, the following five positive beliefs about worry are sampled by the WW-II: (1) Worry Aids in Problem Solving; (2) Worry helps to Motivate the Individual; (3) Worrying Protects the Individual from Difficult Emotions in the Event of a Negative Outcome; (4) The Act of Worrying itself Prevents Negative Outcomes; and (5) Worry is a Positive Personality Trait. Response options are provided along a five-point, Likert-type scale and range from "not at all true of me" to "absolutely true of me". Five subscale scores can be calculated by summing the responses to each item of the particular subscale. Possible subscale scores range from 5 to 25. The higher the score an individual achieves on a specific subscale, the more inclined he/she would be to hold that specific positive belief about worry. The total score of the WW-II is calculated by summing responses across all 25 items. Total scores of the WW-II can range from 25 to 125 (Holowka et al., 2000).

The WW-II has demonstrated convergent validity with other measures of positive beliefs about worry and divergent validity with measures of negative beliefs about worry (Holowka et al., 2000). An internal consistency coefficient of .93 was reported for the total score of the WW-II in a non-clinical sample of university students (Holowka et al., 2000). The same source reports internal reliability coefficients ranging from .71 to .84 for the five WW-II subscales.

5.5 TRANSLATION OF THE QUESTIONNAIRES

Given that the UFS is a parallel-medium institution offering instruction in English and Afrikaans, it was decided to translate the questionnaires into Afrikaans. Consequently, a bilingual psychologist translated all the measuring instruments from English into Afrikaans. A second bilingual psychologist then translated the Afrikaans translations back into English to ensure that the Afrikaans translations were valid reflections of the original English

versions. Discrepancies in the second translation were resolved by consensus between the two psychologists. The Afrikaans translations of the relevant measuring instruments are included in Appendix B.

It was assumed that, as students at the UFS, all participants would possess sufficient proficiency in either Afrikaans or English to be able to comprehend and respond to the items in the questionnaires. However, while the vast majority of black students at the UFS receive instruction in English, their home language is almost never English or exclusively English. Consequently, prior to conducting any further analyses, it was necessary to ensure that the internal reliabilities of the Afrikaans translations of the questionnaires were acceptable and that the English questionnaires completed by individuals who did not have English as their mother tongue (the black participants) displayed similarly adequate internal consistency. The results of these analyses are reported in Table 2.

Table 2

Cronbach's α -Coefficients for the PSWQ, CAQ, WW-II, MCQ-30, MWQ, TCQ, IUS and the NPOQ for the Total Sample, English-Speaking Caucasian Participants, Afrikaans-Speaking Caucasian Participants and Black Participants

	α -coefficients			
	Total sample (N = 1224)	English-speaking Caucasian students (n = 73)	Afrikaans-speaking Caucasian students (n = 540)	Black students (n = 611)
PSWQ: Total Score	.818	.886	.875	.741
CAQ: Thought substitution	.718	.691	.753	.659
CAQ: Transformation of images into thoughts	.811	.802	.835	.755
CAQ: Distraction	.807	.813	.823	.722
CAQ: Avoidance of threatening stimuli	.818	.836	.859	.743
CAQ: Thought suppression	.792	.800	.836	.737
IUS: Total Score	.927	.945	.936	.909
MCQ-30: Positive belief	.824	.898	.839	.798
MCQ-30: Negative belief	.800	.841	.832	.750
MCQ-30: Low cognitive confidence	.796	.859	.814	.765
MCQ-30: Need to control thoughts	.683	.749	.692	.659
MCQ-30: Cognitive self-consciousness	.721	.831	.736	.689
MWQ: Frequency scale	.895	.916	.900	.881
MWQ: Belief scale	.908	.911	.929	.886
NPOQ: Total Score	.926	.944	.933	.914
TCQ: Distraction	.698	.808	.710	.670
TCQ: Social control	.638	.587	.690	.594
TCQ: Worry	.779	.822	.761	.785
TCQ: Punishment	.759	.788	.761	.744
TCQ: Re-appraisal	.677	.774	.705	.625
WW-II: Aids in problem-solving	.775	.808	.766	.746
WW-II: Motivates	.804	.838	.814	.782
WW-II: Protects the individual from negative emotions	.764	.744	.766	.735
WW-II: Prevents negative emotions	.738	.781	.727	.714
WW-II: Positive personality trait	.748	.747	.777	.690

Note: PSWQ = Penn State Worry Questionnaire; CAQ = Cognitive Avoidance Questionnaire; IUS = Intolerance of Uncertainty Scale; MCQ-30: Meta-cognitions Questionnaire-30; MWQ: Meta Worry Questionnaire; NPOQ = Negative Problem Orientation Questionnaire; TCQ: Thought Control Questionnaire; WW-II = Why Worry II Scale;

Foster and Parker (1999) suggest that Cronbach's α -coefficients for non-cognitive measures at least equal .7 before the measures in question can be considered to possess an adequate levels of internal consistency. It is evident from Table 2 that, with the exception of the TCQ Social Control subscale (for the total sample, $\alpha = .638$; for the English-speaking Caucasian students, $\alpha = .587$ and for the black students, $\alpha = .594$) and the TCQ Re-appraisal subscale (for the black students: $\alpha = .625$), all measures administered demonstrated acceptable levels of internal consistency in that the corresponding α -coefficients exceed .7. However, to be able to test the three cognitive models of worry across both ethnicities fully, it was decided to

include the Social Control and Re-appraisal subscales of the TCQ in further analyses, as the remaining TCQ subscales all meet the requirements for acceptable internal consistency.

According to Table 2, with the exception of the Social Control and Re-appraisal subscales of the TCQ, all the questionnaires that were administered exhibit acceptable levels of internal consistency. Thus, it can be deduced that the Afrikaans translations of these measures are internally reliable. Moreover, data from the English questionnaires completed by the respondents who did not speak English as a first language suggest that their responses to the questionnaires are internally consistent. Consequently, it was decided to subject all 1224 data sets to further statistical analysis.

5.6 STATISTICAL ANALYSES

It has already been mentioned that the majority of studies conducted on worry make comparisons between different levels of worry intensity (e.g. compare individuals with GAD to individuals without GAD but who obtained significant scores on measures of worry intensity). Consequently, prior to employing statistical analyses aimed at directly answering the research questions posed in the current study, it is necessary to assign participants to worry intensity categories. However, for the purposes of this study this categorization will be referred to as worry/GAD status because (1) the classification system not only makes use of a measure of worry intensity, but also considers whether or not an individual meets the self-report criteria for a diagnosis of GAD, and (2) worry intensity, as operationalised via the PSWQ total score, serves as a criterion variable in certain subsequent analyses. The criteria for classification are based on the prescribed cut-off points of two measuring instruments, namely the GADQ-IV (cut-off score = 5.7) and the PSWQ (high worry ≥ 62 ; low worry ≤ 61).

Given that the primary focus of the study is to test the applicability of three cognitive models of worry in a non-clinical, cross-cultural sample of university students, analyses will be conducted to investigate the role of ethnicity, gender and worry/GAD status in each model (avoidance model of GAD, metacognitive model of GAD and the intolerance of uncertainty model). To this end, moderated hierarchical regression analyses will be conducted. Should

ethnicity, gender and/or worry/GAD status play a role in a particular model, correlation analyses and hierarchical multiple regression analyses will be conducted for each of the relevant variables (ethnicity, gender and/or worry/GAD status).

To test the applicability of the three cognitive models of worry, Pearson's product moment correlation coefficients (Howell, 2007) will be calculated initially to determine the strength of linear relationship between the criterion variable (worry intensity) and each of the predictor variables (variables relevant to the specific model of worry). In instances where the Pearson's product moment correlation analyses indicate a significant correlation between the predictor variables and the criterion variable, hierarchical multiple regression analyses (Howell, 2007) will be performed. In addition to the Pearson's product moment correlation analyses, the effect sizes (r) will also be considered. According to Cohen (1992), limited effect sizes ($r = .1$), medium effect sizes ($r = .3$) and large effect sizes ($r = .5$) can be determined. Only results indicating a medium or large effect size will be interpreted, as smaller effect sizes are considered indicative of a relationship that, while statistically significant, is considered to be of limited practical value.

To further test the applicability of three cognitive models, as well as a combination of these models, in a non-clinical cross-cultural sample of university students, hierarchical multiple regression analyses (Howell, 2007) will be conducted to determine what percentage of the variance in worry intensity (PSWQ total score) is accounted for by the avoidance model of worry and GAD, the metacognitive model of GAD and the intolerance of uncertainty model independently, as well as by all three in combination. In addition, hierarchical regression analyses will be performed not only with regard to each model, but also for each individual predictor variable / subscale score. The percentage of the variance in the PSWQ score accounted for by each of the predictor variables will be indicated by R^2 . To calculate the specific contribution of each predictor to a certain criterion's variance, the R^2 value will be calculated with and without the specified predictor variable. The significance of the difference in R^2 will be calculated by means of a hierarchical F -test, while the effect sizes (f^2) will also be calculated to determine whether a statistically significant difference is of practical concern. According to Cohen (1992) and Steyn (1999), the following guideline values for the interpretation of the effect sizes (f^2) can be used: $f^2 = 0.01$, limited effect size;

$f^2 = 0.15$, medium effect size; and $f^2 = 0.35$, large effect size. Only results indicating medium and large effect sizes will be interpreted in the discussion of the results.

Finally, it will be investigated whether a combined model of excessive worry (combination of the avoidance model of worry and GAD, the metacognitive model of GAD and the intolerance of uncertainty model) accounts for a greater percentage of the variance in worry intensity than that accounted for by each of the models independently. The hierarchical F -test (Howell, 2007) will be employed to determine whether significant differences in R^2 values exist with regard to the different models. Only statistically significant results that indicate medium or large effect sizes will be interpreted (small effect size: $f^2 = 0.01$; medium effect size: $f^2 = 0.15$; large effect size: $f^2 = 0.35$).

All analyses will first be conducted for the total sample. As stated previously, all statistical analyses will be conducted using SPSS Version 17.0 (SPSS Incorporated, 2009). The results of the statistical analyses are reported in Chapter 6.

6 RESULTS

6.1 INTRODUCTION

The first step in the statistical analyses is to classify the research participants into three groups with respect to worry intensity and self-reported GAD-diagnosis. This methodology is based on literature supporting the dimensionality of worry, yet suggesting that highly worried individuals without a diagnosis of GAD and individuals suffering from GAD may differ from low worriers in some respects. Focus then shifts to investigating the role of ethnicity, gender and worry/GAD status in each model (avoidance model of worry and GAD [AMW], metacognitive model of GAD [MCM] and the intolerance of uncertainty model [IUM]). To this end, moderated hierarchical regression analyses will be conducted. Should it emerge that ethnicity, gender and/or worry/GAD status do play a role in a particular model, Pearson's product moment correlation coefficients will be calculated for the cognitive constructs relevant to the particular model. Hierarchical multiple regression analyses will then be conducted to determine what percentage of the variance in worry intensity (PSWQ total score) is accounted for by the AMW, the MCM and the IUM independently, as well as in combination. In addition, hierarchical regression analyses will be performed not only with regard to each model, but also for each individual predictor variable or subscale score. Finally, it will be investigated whether a combined model of excessive worry (combination of the AMW, the MCM and the IUM) accounts for a greater percentage of the variance in worry intensity than that accounted for by each of the models independently. The hierarchical *F*-test will be employed to determine whether significant differences in R^2 values exist with regard to the different models.

6.2 DISTRIBUTION OF WORRY GROUPS

Participants were divided into three groups based on worry intensity (PSWQ) and self-reported GAD diagnosis (GADQ-IV). This methodology was based on literature supporting the dimensionality of worry, yet suggesting that highly worried individuals without a

diagnosis of GAD and individuals suffering from GAD may differ from low worriers in some respects (Ruscio, 2002; Ruscio & Borkovec, 2004). Moreover, highly worried individuals who did not meet the diagnostic criteria for GAD were hypothesized to differ from highly worried individuals who met the diagnostic criteria for GAD with regard to the severity or degree to which they experienced the symptoms of GAD (Ruscio, 2002). The distinction between highly worried individuals without a GAD diagnosis and highly worried individuals suffering from GAD might also be influenced by perceptions and processes beyond the content, intensity and chronicity of worry (e.g. different appraisals about worry, increased emotional dysregulation) (Holaway et al., 2003; Ruscio & Borkovec, 2004). An additional motivation for dividing the sample into groups on the basis of worry intensity and GAD diagnosis is that, to date, most studies on excessive worry have examined individuals suffering from GAD and have rarely examined excessive worry independent of GAD, thus leaving excessive worry outside the context of GAD poorly understood (Ruscio, 2002; Ruscio & Borkovec, 2004). Literature suggests that a number of highly worried individuals fail to meet the diagnostic criteria for GAD, yet suffer from excessive and uncontrollable worry. In part, the current study, aims to develop a better understanding of cognitive processes underlying worry outside the context of GAD.

The participants in the current study were divided into three groups (low worry, high-worry non-GAD, high worry GAD) based on worry intensity and self-reported GAD diagnosis. Behar et al. (2003) and Fresco et al. (2002) suggest that a PSWQ score greater than 62 signifies a clinically significant level of worry. Consequently, participants with PSWQ scores of 61 or less were classified as low worriers, while those with scores of 62 or more were classified as high worriers. Newman et al. (2002) recommend using a GADQ-IV score of 5.7 as an indicator of analogue GAD status. Consequently, highly worried individuals (PSWQ $\geq$ 62) with GADQ-IV scores of 5.7 or less were classified as high-worry non-GAD, while those with PSWQ scores of 62 or more and GADQ-IV scores of 5.8 or more were classified as high-worry GAD. The frequency distribution of the sample by GAD/worry status is reported in Table 3.

Table 3

Frequency Distribution of the Sample with Respect to GAD/Worry Status by gender and ethnicity (N = 1224)

	High-worry GAD		High-worry non-GAD		Low worry		Total
	<i>n</i>	%	<i>N</i>	%	<i>n</i>	%	<i>n</i>
Caucasian	33	2.7	26	2.1	554	45.3	613
Black	37	3.0	23	1.9	551	45.0	611
Total ethnicity	70	5.7	49	4.0	1105	90.3	1224
Male	12	1.0	6	0.5	497	40.6	515
Female	58	4.7	43	3.5	608	49.7	709
Total gender	70	5.7	49	4.0	1105	90.3	1224

It is apparent from Table 3 that high-worry individuals ($PSWQ \geq 62$) achieving a self-report diagnosis of GAD ($GADQ-IV \geq 5.8$) comprise 5.7% ($n = 70$) of the sample. The prevalence of self-report GAD in the current sample appears to be largely in keeping with epidemiological data for lifetime prevalence of GAD of between 4% and 7% (Kessler et al., 2005; Wittchen et al., 1994). It is also evident from Table 3 that the high-worry GAD group consist of thirty three (2.7%) Caucasian and thirty seven (3.0%) black participants. Females made up 4.7% (58) of this group. Of the individuals scoring below the self-report cut-off for GAD ($GADQ-IV \leq 5.7$), 4% ($n = 49$) were classified as high worriers ($PSWQ \geq 62$), while the remaining 1105 participants (90.3%) were classified as low worriers. The high-worry non-GAD group consisted of twenty six (2.1%) Caucasian and twenty three (1.9%) black participants, while the low-worry group consisted of five hundred and fifty four (45.3%) Caucasian and five hundred and fifty one (45.0%) black participants. Females made up 3.5% ($n=43$) of the high-worry non-GAD group and 49.7% ($n=608$) of the low-worriers. The vast majority of participants in the current study thus report levels of worry intensity that would be considered normal (i.e. neither excessive nor uncontrollable). It should be noted that the relatively small size of the high-worry non-GAD and high-worry GAD groups would be expected to limit the extent to which findings from the analyses involving these groups can be generalized.

Having classified the participants according to their worry/GAD status, moderated hierarchical regression analyses were conducted to investigate the role of ethnicity, gender and worry/GAD status in each model of worry (AMW, MCM and IUM).

6.3 ROLE OF BIOGRAPHICAL VARIABLES IN REGRESSION EQUATIONS

Moderated hierarchical multiple regression analyses were conducted to determine whether the relationship between the predictor variables (constructs relevant to models of worry) and the criterion variable (worry intensity) is moderated by biographical variables (ethnicity, gender and worry/GAD status). Given that the primary goal of the study is to test three models of worry (AMW, MCM and IUM), the possible influence of the three biographical variables will be tested for each model separately, as well as for a combined model (all three models). In Step 1 of the moderated multiple regression analyses, all the predictor variables will be added for each model. In Step 2 (2a-2d), all the predictor variables will be added for each model, but each of the biographical variables will be added separately. If a specific biographical variable does moderate the relationship between the predictor variables and the criterion variable, a significant change should be evident in R^2 .

6.3.1 Role of biographical variables in the AMW

A moderated hierarchical multiple regression analysis was conducted to determine the effect of ethnicity (2a), gender (2b) and worry/GAD status (2c and 2d) on the relationship between the variables relevant to the AMW and worry intensity. The results of this analysis are presented in Table 4. It proved necessary to create dummy variables to utilise the categorical data in the analysis. In the case of ethnicity and gender, where two categories exist, a single dummy variable was created with 1 and 0 as the two categories. However, as worry/GAD status is divided into three categories, it was necessary to create two dummy variables.

In the following analysis, worry intensity serves as the dependent variable, while all the constructs relevant to the AMW (CAQ subscale scores, Positive Beliefs about Worry subscale scores on the MCQ-30 and WW-II subscale scores) serve as independent variables.

Table 4

Moderating Effect of Ethnicity, Gender and Worry/GAD Status in the Relationship Between Worry Intensity and the Predictors (AMW)

Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Change statistics				
				<i>R</i> ² change	<i>F</i> change	df1	df2	Sig <i>F</i> Change
1	0.514	0.264	0.258	0.264	39.464	11	1208	0.000
2a	0.515	0.265	0.258	0.001	1.415	1	1207	0.234
2b	0.536	0.288	0.281	0.023	39.689	1	1207	0.000
2c	0.600	0.360	0.354	0.096	181.060	1	1207	0.000
2d	0.639	0.408	0.403	0.144	293.981	1	1207	0.000

The results confirm a statistically significant relationship between worry intensity and the predictors ($R^2 = 0.264$; $F_{11;1208} = 39.464$; $p = 0.000$). Thus, the set of predictors (CAQ subscale scores, Positive Beliefs about Worry subscale scores on the MCQ-30 and WW-II subscale scores) accounts for approximately 26% of the variance in the worry intensity of the whole sample. Furthermore, it appears that both gender (2b) and worry/GAD status (2c and 2d) moderate the relationship between the predictors (CAQ subscale scores, Positive Beliefs about Worry subscale scores on the MCQ-30 and WW-II subscale scores) and worry intensity. The addition of gender ($\Delta R^2 = 0.023$; $F_{1;1207} = 39.680$; $p = 0.000$) to the model accounts for an additional 2.3% of the variance in worry intensity. The addition of the first worry/GAD-status dummy variable (high-worry non-GAD = 1; high-worry GAD and low worry = 0) to the original model accounts for an additional 9.6% of the variance in worry intensity ($\Delta R^2 = 0.096$; $F_{1;1207} = 181.060$; $p = 0.000$). Similarly, the addition of the second worry/GAD-status dummy variable (high-worry GAD = 1; high-worry non-GAD and low worry = 0) accounts for an additional 14.4% of the variance in worry intensity ($\Delta R^2 = 0.144$; $F_{1;1207} = 293.981$; $p = 0.000$). Thus, it is evident that both gender and worry/GAD status moderate the relationship between the predictors (CAQ subscale scores, Positive Beliefs about Worry subscale scores on the MCQ-30 and WW-II subscale scores) and worry intensity for the total sample. Consequently, it is necessary to conduct regression analyses investigating the extent to which variables relevant to the AMW account for a significant percentage of the variance in worry intensity scores for the whole sample, as well as with respect to gender and worry/GAD status.

It is apparent from Table 4 that ethnicity (2a) does not moderate the relationship between the predictors relevant to the AMW and worry intensity. Consequently, subsequent regression analyses need not be conducted independently for ethnicity.

6.3.2 Role of biographical variables in the MCM

A moderated hierarchical multiple regression analysis was conducted to determine the effect of ethnicity (2a), gender (2b) and worry/GAD status (2c and 2d) on the relationship between the variables relevant to the MCM and worry intensity. The results of this analysis are presented in Table 5. In the following analysis, worry intensity serves as the dependent variable, while all the constructs relevant to the MCM (TCQ subscale scores, MWQ subscale scores, MCQ-30 subscale scores and WW-II subscale scores) serve as independent variables.

Table 5

Moderating Effect of Ethnicity, Gender and Worry/GAD Status in the Relationship Between Worry Intensity and the Predictors (MCM)

Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Change statistics				
				<i>R</i> ² change	<i>F</i> change	df1	df2	Sig <i>F</i> Change
1	0.617	0.380	0.371	0.380	43.384	17	1202	0.000
2a	0.617	0.380	0.371	0.000	0.297	1	1201	0.586
2b	0.634	0.401	0.392	0.021	42.450	1	1201	0.000
2c	0.686	0.471	0.463	0.091	206.035	1	1201	0.000
2d	0.680	0.463	0.455	0.083	185.248	1	1201	0.000

The results depicted in Table 5 confirm a statistically significant relationship between worry intensity and the predictors ($R^2 = 0.380$; $F_{17;1202} = 43.384$; $p = 0.000$). Thus, the set of predictors (TCQ subscale scores, MWQ subscale scores, MCQ-30 subscale scores and WW-II subscale scores) accounts for approximately 38% of the variance in the worry intensity of the whole sample. Furthermore, it appears that both gender (2b) and worry/GAD status (2c and 2d) moderate the relationship between the predictors (TCQ subscale scores, MWQ subscale scores, MCQ-30 subscale scores and the WW-II subscale scores) and worry intensity. The addition of gender ($\Delta R^2 = 0.021$; $F_{1;1201} = 42.450$; $p = 0.000$) to the model accounts for an additional 2.1% of the variance in worry intensity. The addition of the first worry/GAD status dummy variable (high-worry non-GAD = 1; high-worry GAD and low worry = 0) to the original model accounts for an additional 9.1% of the variance in worry intensity ($\Delta R^2 =$

0,091 $F_{1;1201} = 206,035$; $p = 0,000$). Similarly, the addition of the second worry/GAD status dummy variable (high-worry GAD = 1; high-worry non-GAD and low worry = 0) accounts for an additional 8.3% of the variance in worry intensity ($\Delta R^2 = 0.083$; $F_{1;1201} = 185.248$; $p = 0.000$). Thus, it is evident that both gender and worry/GAD status moderate the relationship between the predictors (TCQ subscale scores, MWQ subscale scores, MCQ-30 subscale scores and WW-II subscale scores) and worry intensity. Consequently, it is necessary to conduct regression analyses investigating the extent to which variables relevant to the MCM account for a significant percentage of the variance in worry intensity scores for the whole sample, as well as with respect to gender and worry/GAD status.

It is apparent from Table 5 that ethnicity (2a) does not moderate the relationship between the predictors relevant to the MCM and worry intensity. Consequently, subsequent regression analyses need not be conducted independently for ethnicity.

6.3.3 Role of biographical variables in the IUM

A moderated hierarchical multiple regression analysis was conducted to determine the effect of ethnicity (2a), gender (2b) and worry/GAD status (2c and 2d). The results of this analysis are presented in Table 6. In the following analysis, worry intensity serves as the dependent variable, while all the constructs relevant to the IUM (CAQ subscale scores, WW-II subscale scores, NPOQ total score, Positive Beliefs about Worry subscale of the MCQ-30 and IUS total score) serve as independent variables.

Table 6

Moderating Effect of Ethnicity, Gender and Worry/GAD Status in the Relationship Between Worry Intensity and the Predictors (IUM)

Model	R	R^2	Adjusted R^2	Change statistics				
				R^2 change	F change	df1	df2	Sig F Change
1	0.594	0.353	0.346	0.353	50.490	13	1205	0.000
2a	0.594	0.353	0.345	0.000	0.479	1	1204	0.489
2b	0.610	0.372	0.365	0.020	37.509	1	1204	0.000
2c	0.665	0.442	0.436	0.090	193.893	1	1204	0.000
2d	0.674	0.454	0.448	0.102	224.249	1	1204	0.000

The results confirm a statistically significant relationship between worry intensity and the predictors ($R^2 = 0.353$; $F_{13;1205} = 50.490$; $p = 0.000$). Thus, the set of predictors (CAQ subscale scores, WW-II subscale scores, NPOQ total score, Positive Beliefs about Worry subscale of the MCQ-30 and IUS total score) accounts for approximately 35% of the variance in the worry intensity of the whole sample. Furthermore, it appears that both gender (2b) and worry/GAD status (2c and 2d) moderate the relationship between the predictors (CAQ subscale scores, WW-II subscale scores, NPOQ total score, Positive Beliefs about Worry subscale of the MCQ-30 and IUS total score) and worry intensity. The addition of gender ($\Delta R^2 = 0.020$; $F_{1;1204} = 37.509$; $p = 0.000$) to the model accounts for an additional 2% of the variance in worry intensity. The addition of the first worry/GAD-status dummy variable (high-worry non-GAD = 1; high-worry GAD and low worry = 0) to the original model accounts for an additional 9% of the variance in worry intensity ($\Delta R^2 = 0.090$ $F_{1;1204} = 193.893$; $p = 0.000$). Similarly, the addition of the second worry/GAD status dummy variable (high-worry GAD = 1; high-worry non-GAD and low worry = 0) accounts for an additional 10.2% of the variance in worry intensity ($\Delta R^2 = 0.102$; $F_{1;1204} = 224.249$; $p = 0.000$). Thus, it is evident that both gender and worry/GAD status moderate the relationship between the predictors (CAQ subscale scores, WW-II subscale scores, NPOQ total score, Positive Beliefs about Worry subscale of the MCQ-30 and IUS total score) and worry intensity. Consequently, it is necessary to conduct regression analyses investigating the extent to which variables relevant to the IUM account for a significant percentage of the variance in worry intensity scores for the whole sample, as well as with respect to gender and worry/GAD status.

It is apparent from Table 6 that ethnicity (2a) does not moderate the relationship between the predictors relevant to the IUM and worry intensity. Consequently, subsequent regression analyses need not be conducted independently for ethnicity.

6.3.4 Role of biographical variables in the combined model

A moderated hierarchical multiple regression analysis was conducted to determine the effect of ethnicity (2a), gender (2b) and worry/GAD status (2c and 2d) on the relationship between worry intensity and a combined model consisting of all variables relevant to the AMW, the MCM and the IUM of worry. The results of this analysis are presented in Table 7. In the

following analysis, worry intensity serves as the dependent variable, while all the constructs relevant to the combined model (TCQ subscale scores, MWQ subscale scores, MCQ-30 subscale scores, WW-II subscale scores, CAQ subscale scores, NPOQ total score and IUS total score) serve as independent variables.

Table 7

Moderating Effect of Ethnicity, Gender and Worry/GAD Status in the Relationship Between Worry Intensity and the Predictors (Combined Model)

Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Change statistics				
				<i>R</i> ² change	<i>F</i> change	df1	df2	Sig <i>F</i> Change
1	0.641	0.410	0.398	0.410	34.607	24	1194	0.000
2a	0.641	0.410	0.398	0.000	0.021	1	1193	0.885
2b	0.652	0.425	0.413	0.015	31.225	1	1193	0.000
2c	0.704	0.495	0.485	0.085	200.726	1	1193	0.000
2d	0.695	0.483	0.472	0.073	167.871	1	1193	0.000

The results depicted in Table 7 confirm a statistically significant relationship between worry intensity and the predictors ($R^2 = 0.410$; $F_{24;1194} = 34.607$; $p = 0.000$). Thus, the set of predictors (TCQ subscale scores, MWQ subscale scores, MCQ-30 subscale scores, WW-II subscale scores, CAQ subscale scores, NPOQ total score and the IUS total score) accounts for approximately 41% of the variance in the worry intensity of the total sample. Furthermore, it appears that both gender (2b) and worry/GAD status (2c and 2d) moderate the relationship between the predictors (TCQ subscale scores, MWQ subscale scores, MCQ-30 subscale scores, WW-II subscale scores, CAQ subscale scores, NPOQ total score and IUS total score) and worry intensity. The addition of gender ($\Delta R^2 = 0.015$; $F_{1;1193} = 31.225$; $p = 0.000$) to the model accounts for an additional 1.5% of the variance in worry intensity. The addition of the first worry/GAD status dummy variable (high-worry non-GAD = 1; high-worry GAD and low worry = 0) to the original model accounts for an additional 8.5% of the variance in worry intensity ($\Delta R^2 = 0.085$ $F_{1;1193} = 200.726$; $p = 0.000$). Similarly, the addition of the second worry/GAD status dummy variable (high-worry GAD = 1; high-worry non-GAD and low worry = 0) accounts for an additional 7.3% of the variance in worry intensity ($\Delta R^2 = 0.073$; $F_{1;1193} = 167.871$; $p = 0.000$). Thus, it is evident that both gender and worry/GAD status moderate the relationship between the predictors (TCQ subscale scores, MWQ subscale scores, MCQ-30 subscale scores, WW-II subscale scores, CAQ subscale scores, NPOQ total score and IUS total score) and worry intensity. Consequently, it is

necessary to conduct regression analyses investigating the extent to which variables relevant to the combined model account for a significant percentage of the variance in worry intensity scores for the whole sample, as well as with respect to gender and worry/GAD status.

It is also apparent from Table 7 that ethnicity (2a) does not moderate the relationship between the predictors relevant to the combined model and worry intensity. Consequently, subsequent analyses need not be conducted independently for ethnicity.

It is evident from the results of the moderated hierarchical regression analyses (Table 4 to Table 7) that gender and worry/GAD status moderate the relationship between the predictor variables relevant to the AMW, the MCM, the IUM, as well as the combined model and worry intensity in the total sample. Consequently, subsequent regression analyses will be conducted not only for the total sample, but also with respect to gender and worry/GAD status. However, the results of the hierarchical multiple regression analyses reveal that ethnicity did not moderate the relationship between the predictors relevant to the AMW, the MCM, the IUM as well as the combined model and worry intensity. Consequently, it is not necessary to perform subsequent regression analyses independently for ethnicity.

6.4 PEARSON'S PRODUCT MOMENT CORRELATIONS

It was stated previously that Pearson's product moment correlations would be calculated in instances where biographical variables were found to moderate the relationship between worry intensity and the variables relevant to any of the three models of worry or to the combined model of worry. Consequently, as gender and GAD/worry status were found to moderate the relationship between worry intensity and variables relevant to all four models of worry (AMW, MCM, IUM and the combined model), Pearson's product moment correlation coefficients will be calculated to determine the relationship between each of the predictor variables (measures of constructs relevant to each of the three models of worry under investigation) and the criterion variable (PSWQ scores) for the total sample, as well as for gender and worry/GAD status (low worry, high-worry non-GAD and high-worry GAD) independently. Significance was set at the 1% level. However, while all significant correlations will be reported, only those of noteworthy practical importance (medium; ≥ 0.25 to large effect sizes; ≥ 0.45) will be highlighted (Steyn, 1999).

6.4.1 Correlations between CAQ subscale scores and the PSWQ total score

The Pearson's product moment correlation coefficients between the CAQ subscale scores (predictor variables) and the PSWQ total score (criterion variable) for the total sample, as well as for gender and worry/GAD status, are reported in Table 8.

Table 8

Correlations Between CAQ Subscale Scores and the PSWQ Total Score for the Total Sample, Gender and Worry/GAD Status

Groups		CAQ				
PSWQ total score		Thought Substitution	Transformation of Images into Thoughts	Distraction	Avoidance of Threatening Stimuli	Thought Suppression
	Total sample ($N = 1224$)	.229*	.257*	.277*	.296*	.298*
	Female participants ($n = 709$)	.194*	.200*	.229*	.236*	.239*
	Male participants ($n = 515$)	.360*	.357*	.345*	.398*	.350*
	High-worry GAD ($n = 70$)	-.028	-.067	-.020	-.068	-.019
	High-worry non-GAD ($n = 49$)	.095	.108	.059	.179	.118
	Low worry ($n = 1105$)	.230*	.246*	.245*	.270*	.252*

Note: PSWQ = Penn State Worry Questionnaire; CAQ = Cognitive Avoidance Questionnaire

* $p \leq 0.01$

It is evident from Table 8 that, with the exception of the high-worry GAD and high-worry non-GAD participants, significant correlations (at the 1% level) were exhibited between all the CAQ subscale scores and the PSWQ total score. Furthermore, it is apparent that all the significant correlations between the five CAQ subscale scores and the PSWQ total score are positive. Thus, worry intensity (PSWQ total score) would be expected to increase as these subscale scores increase. However, it should be noted that the correlations between the CAQ subscale scores and the PSWQ total score among the high-worry GAD and high-worry non-GAD participants may not have reached statistical significance due to the relatively small size of these two samples (high-worry GAD: $n = 70$; high-worry non-GAD: $n = 49$). It is further evident from Table 8 that the statistically significant correlations (at the 1% level) between four of the CAQ subscale scores (Transformation of Images into Thoughts, Distraction, Avoidance of Threatening Stimuli, and Thought Suppression) and the PSWQ total score for the total sample, as well as for the low-worry participants indicate medium effect sizes. In addition, the statistically significant correlations (at the 1% level) between all five of the CAQ subscale scores and the PSWQ total score indicate medium effect sizes amongst the male participants. These findings suggest that CAQ subscale scores could account for a percentage of the variance in the PSWQ total score of the total sample, the low-worry group and the male participants.

6.4.2 Correlations between the IUS total score and the PSWQ total score

The Pearson's product moment correlations between the IUS total score (predictor variable) and the PSWQ total score (criterion variable) are reported in Table 9.

Table 9

Correlations Between the IUS Total Score and the PSWQ Total Score for the Total Sample, Gender and Worry/GAD Status

Groups		IUS
		Total
PSWQ total score	Total sample ($N = 1224$)	.459*
	Female participants ($n = 709$)	.461*
	Male participants ($n = 515$)	.498*
	High-worry GAD ($n = 70$)	.295
	High-worry non-GAD ($n = 49$)	.184
	Low worry ($n = 1105$)	.415*

Note: PSWQ = Penn State Worry Questionnaire; IUS = Intolerance of Uncertainty Scale

* $p \leq 0.01$

It is apparent from Table 9 that significant correlations (at the 1% level) were found between the IUS total score and the PSWQ total score in the total sample, as well as among the female participants, the male participants and the low-worry participants. Furthermore, it is apparent that all the significant correlations between the IUS total score and the PSWQ total score are positive. Thus, worry intensity (PSWQ total score) would be expected to increase as IUS total scores increase. It is further evident from Table 9 that the statistically significant correlation (at the 1% level) between the IUS total score and the PSWQ total score indicates a medium effect size among the low-worry participants. In addition, the statistically significant correlations (at the 1% level) between the IUS total score and the PSWQ total score for the total sample, as well as for the male and female participants indicate large effect sizes. Consequently, these findings suggest that the IUS total score could account for a percentage of the variance in the PSWQ total score of the total sample, the low-worry sample, the male participants and the female participants. It should also be noted that, although the correlation between the IUS total score and the PSWQ total score among the high-worry GAD participants was not significant at the 1% level (possibly because of the small sample size), this correlation indicates a medium effect size and therefore is of practical importance.

6.4.3 Correlations between MCQ-30 subscale scores and the PSWQ total score

The Pearson's product moment correlation coefficients between the MCQ-30 subscale scores (predictor variables) and the PSWQ total score (criterion variable) are reported in Table 10.

Table 10

Correlations Between MCQ-30 Subscales Scores and the PSWQ total Score for the Total Sample, Gender and Worry/GAD Status

Groups		MCQ-30				
		Positive Beliefs about Worry	Negative Beliefs about Thoughts Concerning Uncontrollability and Danger	Cognitive Confidence	Need to Control Thoughts	Cognitive Self-consciousness
PSWQ total score	Total sample ($N = 1224$)	.314*	.469*	.226*	.231*	.203*
	Female participants ($n = 709$)	.338*	.469*	.219*	.223*	.166*
	Male participants ($n = 515$)	.378*	.499*	.324*	.332*	.282*
	High-worry GAD ($n = 70$)	.187	.258	.329*	.138	.051
	High-worry non-GAD ($n = 49$)	-.023	.087	.088	.244	.243
	Low worry ($n = 1105$)	.343*	.397*	.238*	.236*	.178*

Note: PSWQ = Penn State Worry Questionnaire; MCQ-30 = Meta-Cognitions Questionnaire-30

* $p \leq 0.01$

It is apparent from Table 10 that, with the exception of the high-worry GAD and the high-worry non-GAD participants, significant correlations (at the 1% level) were exhibited between all five of MCQ-30 subscale scores and the PSWQ total score. In addition, the MCQ-30 Cognitive Confidence subscale score also correlated significantly (at the 1% level) with the PSWQ total score among the high-worry GAD participants. Furthermore, it is apparent that all the significant correlations between the five MCQ-30 subscale scores and the PSWQ total score are positive. Thus, worry intensity (PSWQ total score) would be expected to increase as these subscale scores increase. It should also be noted that, despite the correlation between the MCQ-30 Negative Beliefs about Thoughts concerning Uncontrollability and Danger subscale score and the PSWQ total score in the high-worry GAD participants not reaching statistical significance at the 1% level (possibly due to the small sample size), this correlation indicates a medium effect size and therefore is of practical importance.

According to Table 10, the statistically significant correlations (at the 1% level) between the MCQ-30 Positive Beliefs about Worry subscale scores and the PSWQ total score indicate a medium effect size for both the total sample and the female participants, while the statistically significant correlations (at the 1% level) between the MCQ-30 Negative Beliefs about Thoughts Concerning Uncontrollability and Danger subscale scores and the PSWQ total score indicate a large effect size for the total sample and the female participants. In addition, the statistically significant correlations (at the 1% level) between four of the MCQ-30 subscale scores (Positive Beliefs about Worry, Cognitive Confidence, Need to Control Thoughts, Cognitive Self-consciousness) and the PSWQ total score indicate medium effect sizes for the male participants. The correlation between the MCQ-30 Negative Beliefs about Thoughts Concerning Uncontrollability and Danger subscale and the PSWQ total score indicate a large effect size for the male participants. It is also apparent from Table 10 that the statistically significant correlations (at the 1% level) between two MCQ-30 subscale scores (Positive Beliefs about Worry and Negative Beliefs about Thoughts Concerning Uncontrollability and Danger) and the PSWQ total score indicate medium effect sizes among the low-worry participants. Additionally, the statistically significant correlation (at the 1% level) between the MCQ-30 Cognitive Confidence subscale score and the PSWQ total score indicate a medium effect size among the high-worry GAD participants. These findings suggest that MCQ subscale scores could account for a percentage of the variance in the PSWQ total score of the total sample, the low-worry participants, the male participants and the female participants.

6.4.4 Correlations between MWQ subscale scores and the PSWQ total score

The Pearson's product moment correlation coefficients between the MWQ subscale scores (predictor variables) and the PSWQ total score (criterion variable) are reported in Table 11.

Table 11

Correlations Between MWQ Subscale Scores and the PSWQ Total Score for the Total Sample, Gender and Worry/GAD Status

Groups		MWQ	
		Frequency	Belief
PSWQ total score	Total sample ($N = 1224$)	.368*	.382*
	Female participants ($n = 709$)	.412*	.404*
	Male participants ($n = 515$)	.382*	.402*
	High-worry GAD ($n = 70$)	.401*	.319*
	High-worry non-GAD ($n = 49$)	.163	.031
	Low-worry ($n = 1105$)	.284*	.252*

Note: PSWQ = Penn State Worry Questionnaire; MWQ = Meta Worry Questionnaire

* $p \leq 0.01$

Table 11 indicates that significant correlations (at the 1% level) were found between both MWQ subscale scores (Frequency, Belief) and the PSWQ total score for the total sample, both genders and two of the worry conditions (high-worry GAD and low worry). It is apparent from Table 11 that all the significant correlations between the two MWQ subscale scores and the PSWQ total score are positive. Thus, worry intensity (PSWQ total score) would be expected to increase as the two MWQ subscale scores increase. Furthermore, all of these significant correlations indicate medium effect sizes. These findings suggest that MWQ Frequency and MWQ Beliefs subscale scores could account for a percentage of the variance in the PSWQ total score of the total sample, the male participants, the female participants, the high-worry GAD participants and the low-worry participants.

6.4.5 Correlations between the NPOQ total score and the PSWQ total score

The Pearson's product moment correlation coefficients between the NPOQ total score (predictor variable) and the PSWQ total score (criterion variable) are reported in Table 12.

Table 12

Correlations Between the NPOQ Total Score and the PSWQ Total Score for the Total Sample, Gender and Worry/GAD Status

Groups		NPOQ
		Total
PSWQ total score	Total sample ($N = 1224$)	.349*
	Female participants ($n = 709$)	.441*
	Male participants ($n = 515$)	.474*
	High-worry GAD ($n = 70$)	.419*
	High-worry non-GAD ($n = 49$)	.313
	Low-worry ($n = 1105$)	.387*

Note: PSWQ = Penn State Worry Questionnaire; NPOQ = Negative Problem Orientation Questionnaire

* $p \leq 0.01$

Table 12 indicates that significant correlations (at the 1% level) exist between the NPOQ total score and the PSWQ total score among all the groups, with the exception of the high-worry non-GAD participants. Furthermore, it is apparent that all the significant correlations between the NPOQ total score and the PSWQ total score are positive. Thus, worry intensity (PSWQ total score) would be expected to increase as the NPOQ total score increases. It should also be noted that although the correlation between the NPOQ total score and the PSWQ total score among the high-worry non-GAD participants was not significant at the 1% level (possibly because of the small sample size), this correlation indicates a medium effect size and therefore is of practical importance.

According to Table 12, the statistically significant correlations (at the 1% level) between the NPOQ total score and the PSWQ total score in the total sample, as well as among the female participants, the high-worry GAD participants and the low-worry participants indicate medium effect sizes. In addition, the statistically significant correlation (at the 1% level) between the NPOQ total score and the PSWQ total score among the male participants indicate a large effect size. These findings suggest that the NPOQ total score could account for a percentage of the variance in the PSWQ total score of the total sample, the female participants, the male participants, the high-worry GAD participants and the low-worry participants.

6.4.6 Correlations between TCQ subscale scores and the PSWQ total score

The Pearson's product moment correlation coefficients between the TCQ subscale scores (predictor variables) and the PSWQ total score (criterion variable) are reported in Table 13.

Table 13

Correlations Between TCQ Subscale Scores and the PSWQ Total Score for the Total Sample, Gender and Worry/GAD Status

	Groups	TCQ				
		Distraction	Social Control	Worry	Punishment	Re-appraisal
PSWQ total score	Total sample ($N = 1224$)	.143*	-.081*	.248*	.210*	.158*
	Female participants ($n = 709$)	.084*	-.070*	.273*	.234*	.111*
	Male participants ($n = 515$)	.217*	-.110	.308*	.285*	.273*
	High-worry GAD ($n = 70$)	.111	-.023	.369*	.084	.120
	High-worry non-GAD ($n = 49$)	.226	.199	-.020	.065	.298*
	Low worry ($n = 1105$)	.132*	-.066	.245*	.235*	.180*

Note: PSWQ = Penn State Worry Questionnaire; TCQ = Thought Control Questionnaire

* $p \leq 0.01$

It is apparent from Table 13 that significant correlations (at the 1% level) was found between all five TCQ subscale scores and the PSWQ total score for the total sample and female participants. Statistically significant correlations (at the 1% level) are also evident between four of the TCQ subscale scores (Distraction, Worry, Punishment, Re-appraisal) and the PSWQ total score among the male participants and the low-worry participants. In addition, a statistically significant correlation (at the 1% level) were found between the Worry subscale score of the TCQ and the PSWQ total score among the high-worry GAD participants, while a significant correlation (at the 1% level) was found between the Re-appraisal subscale score and the PSWQ total score among the high-worry non-GAD participants. Furthermore, it is apparent that all the significant correlations between the TCQ subscale scores (with the exception of the TCQ Social Control subscale score) and the PSWQ total score are positive. Thus, worry intensity (PSWQ total score) would be expected to increase as TCQ subscale scores increase. In addition, the negative correlation between the TCQ Social Control subscale score and the PSWQ total score is statistically significant at the 1% level for both the total sample and the female participants. Thus, worry intensity (PSWQ total score) would be expected to increase as the TCQ Social Control subscale score decreases.

According to Table 13, the statistically significant correlation (at the 1% level) between the TCQ Worry subscale scores and the PSWQ total score indicate a medium effect size for the total sample, female participants, high-worry GAD and the low-worry participants. It is also evident from Table 13 that the statistically significant correlations (at the 1% level) between three of the TCQ subscale scores (Worry, Punishment, Re-appraisal) and the PSWQ total score indicate medium effect sizes among the male participants. Additionally, a statistically significant correlation (at the 1% level) between the Re-appraisal subscale score of the TCQ and the PSWQ total score indicates a medium effect size among the high-worry non-GAD participants. These findings suggest that TCQ subscale scores could account for a percentage of the variance in the PSWQ total score of the total sample, the male participants, the female participants, the high-worry GAD and the low-worry participants.

6.4.7 Correlations between WW-II subscale total scores and the PSWQ total score

The Pearson's product moment correlation coefficients between the WW-II subscale scores (predictor variables) and the PSWQ total score (criterion variable) are reported in Table 14.

Table 14

Correlations Between WW-II Subscale Scores and the PSWQ Total Score for the Total Sample, Gender and Worry/GAD Status

Groups			WW-II			
	Worry Aids in Problem Solving	Worry helps Motivate	Worry Protects from Difficult Emotions	Worry Prevents Negative Outcomes	Worry is a Positive Personality Trait	
PSWQ total score	Total sample ($N = 1224$)	.389*	.446*	.329*	.246*	.397*
	Female participants ($n = 709$)	.394*	.456*	.357*	.252*	.367*
	Male participants ($n = 515$)	.455*	.446*	.392*	.399*	.520*
	High-worry GAD ($n = 70$)	.078	.310	.077	.022	.019
	High-worry non-GAD ($n = 49$)	-.021	.051	-.041	.024	.164
	Low worry ($n = 1105$)	.403*	.424*	.323*	.264*	.397*

Note: PSWQ = Penn State Worry Questionnaire; WW-II = Why Worry II Scale

* $p \leq 0.01$

Table 14 indicates that, with the exception of the high-worry GAD and the high-worry non-GAD participants, significant correlations (at the 1% level) were exhibited between all five of the WW-II subscale scores and the PSWQ total score. It should also be noted that, despite the correlation between the WW-II Worry helps Motivate subscale score and the PSWQ total score in the high-worry GAD participants not reaching statistical significance at the 1% level (possibly due to the small sample size), this correlation indicates a medium effect size and therefore is of practical importance. Furthermore, it is apparent that all the significant correlations between the WW-II subscale scores and the PSWQ total score are positive. Thus, worry intensity (PSWQ total score) would be expected to increase as WW-II subscale scores increase.

According to Table 14, all the statistically significant correlations (at the 1% level) between WW-II subscale scores and the PSWQ total score for the total sample and the low-worry participants indicate medium effect sizes. In addition, the statistically significant correlations (at the 1% level) between four of the WW-II subscale scores (Worry Aids in Problem Solving, Worry Protects from Difficult Emotions, Worry Prevents Negative Outcomes and Worry is a Positive Personality Trait) and the PSWQ total score indicate medium effect sizes among the female participants, while the correlation between the WW-II Worry helps Motivate subscale score and the PSWQ total score indicate a large effect size for this group. It is also apparent from Table 14 that the statistically significant correlations (at the 1% level) between the Worry Protects from Difficult Emotions and the Worry Prevents Negative

Outcomes subscale scores of the WW-II and the PSWQ total score indicate medium effect sizes among the male participants. In addition, the correlations between the Worry Aids in Problem Solving, Worry helps Motivate and Worry is a Positive Personality Trait subscale scores and the PSWQ total score indicate large effect sizes among the male participants. These findings suggest that WW-II subscale scores could account for a percentage of the variance in the PSWQ total score of the total sample, the male participants, the female participants and the low-worry participants.

Having reported the results of the correlation analyses with the constructs relevant to each of the three models of worry as predictor variables and the PSWQ as the criterion variable, hierarchical multiple regression analyses will be performed to determine what percentage of the variance in worry intensity (PSWQ total score) is predicted by the AMW, the MCM and the IUM independently, as well as in combination. Hierarchical regression analyses will be performed not only with regard to each model, but also for each individual predictor variable / subscale score. It should be noted that hierarchical regression analyses will be conducted not only for the total sample, but also for gender and worry/GAD status. The results of the hierarchical multiple regression analyses of the AMW will be reported in section 6.5.

6.5 HIERARCHICAL MULTIPLE REGRESSION ANALYSES

As stated in section 6.1, after determining the correlations between PSWQ total scores (worry intensity) and the variables relevant to each of the three models of worry under investigation, it becomes necessary to conduct hierarchical multiple regression analyses to determine the amount of variance in worry intensity that is accounted for by each model independently, as well as by a combination of the three models. Consequently, hierarchical multiple regression analyses were conducted with worry intensity (PSWQ total score) as the criterion variable and the cognitive variables relevant to each of the models (AMW, MCM, IUM and a combination of the three models) serving as predictor variables. However, according to results of the moderated hierarchical regression analyses reported in section 6.3, only gender and worry/GAD status moderate the relationship between worry intensity and the variables relevant to the three models of worry. Therefore, subsequent hierarchical multiple regression analyses will be conducted only for the total sample, gender and worry/GAD status.

6.5.1 Avoidance model of worry and GAD (AMW)

Hierarchical multiple regression analyses were conducted with respect to the AMW to determine whether the CAQ subscale scores, the Positive Beliefs about Worry subscale scores on the MCQ-30 and the WW-II subscale scores (predictor variables) account for a significant percentage of the variance in the PSWQ total score (criterion variable). These analyses were performed for the total sample, as well as for gender and worry/GAD status (low worry, high-worry non-GAD and high-worry GAD) independently. The results of the regression analysis for the total sample are reported in Table 15.

Table 15

Results of the Hierarchical Multiple Regression Analysis of the AMW for the Total Sample (N = 1224) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1.	[MCQ-30: Pos]+[WW-II]+[CAQ]	0.264	1-7 = 0.029	9.551*	0.04
2.	[MCQ-30: Pos]+[WW-II]+sub	0.241	2-7 = 0.006	9.613*	0.01
3.	[MCQ-30: Pos]+[WW-II]+trans	0.245	3-7 = 0.01	16.106*	0.01
4.	[MCQ-30: Pos]+[WW-II]+distrac	0.250	4-7 = 0.015	23.32*	0.02
5.	[MCQ-30: Pos]+[WW-II]+avoid	0.256	5-7 = 0.021	34.322*	0.03
6.	[MCQ-30: Pos]+[WW-II]+supp	0.261	6-7 = 0.026	42.782*	0.04
7.	[MCQ-30: Pos]+[WW-II]	0.235			
8.	[MCQ-30: Pos]+[CAQ]+[WW-II]	0.264	8-14 = 0.096	31.617*	0.13
9.	[MCQ-30: Pos]+[CAQ]+aids	0.211	9-14 = 0.043	66.271*	0.05
10.	[MCQ-30: Pos]+[CAQ]+motivate	0.241	10-14 = 0.073	116.952*	0.1
11.	[MCQ-30: Pos]+[CAQ]+protects	0.170	11-14 = 0.002	2.93	-
12.	[MCQ-30: Pos]+[CAQ]+prevents	0.192	12-14 = 0.024	36.119*	0.03
13.	[MCQ-30: Pos]+[CAQ]+positive	0.218	13-14 = 0.05	77.749*	0.06
14.	[MCQ-30: Pos]+[CAQ]	0.168			
15.	[WW-II]+[CAQ]+ [MCQ-30: Pos]	0.264	15-16 = 0.002	3.293	-
16.	[WW-II]+[CAQ]	0.262			

Note: MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is apparent from Table 15 that all the scales measuring cognitive variables hypothesized to comprise the AMW together account for 26.4% of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level ($F_{11,1208} = 39.464$).

Table 15 also indicates that, together, the CAQ subscale scores account for 2.9% ($F_{5,1212} = 9.551$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size (f^2). Moreover, the individual CAQ subscale scores independently account for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the total sample. However, given the small effect sizes (f^2) reported in Table 15, these results, while statistically significant (at the 1% level), appear to be of limited practical importance.

Table 15 indicates that the WW-II subscale scores together account for 9.6% of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level ($F_{5;1212} = 31.617$) and indicates a medium effect size. In addition, four of the WW-II subscales (Worry Aids in Problem Solving, Worry helps Motivate, Worry Prevents Negative Outcomes and Worry is a Positive Personality Trait) appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the total sample. Worry Aids in Problem Solving accounts for 4.3% ($F_{1;1216} = 66.271$), Worry helps Motivate accounts for 7.3% ($F_{1;1216} = 116.952$), Worry Prevents Negative Outcomes accounts for 2.4% ($F_{1;1216} = 36.119$) and Worry is a Positive Personality Trait accounts for 5.0% ($F_{1;1216} = 77.749$) of the variance. However, only the Worry helps Motivate subscale score yields a medium effect size. Consequently, while four of the WW-II subscale scores account for a significant percentage of the variance in the PSWQ total score, only the variance accounted for by the Worry helps Motivate subscale score appears to be of practical importance.

It is also evident from Table 15 that the Positive Beliefs about Worry subscale score on the MCQ-30 accounts for 0.2% ($F_{1;1212} = 3.293$) of the variance in the PSWQ total score in the total sample. However, this result is not significant at the 1% level.

Moderated multiple regression analyses in section 6.3.1 revealed that only gender and worry/GAD status moderates the relationship between the predictor variables relevant to the AMW and worry intensity. Consequently, in addition to conducting hierarchical multiple regression analyses for the total sample, it was also necessary to conduct these analyses for gender and worry/GAD status. The results of the hierarchical multiple regression analyses of the AMW for the female participants are reported in Table 16.

Table 16

Results of the Hierarchical Multiple Regression Analysis of the AMW for the Female Participants (n = 709) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1.	[MCQ-30: Pos]+[WW-II]+[CAQ]	0.259	1-7 = 0.017	3.198*	0.02
2.	[MCQ-30: Pos]+[WW-II]+sub	0.244	2-7 = 0.002	1.854	-
3.	[MCQ-30: Pos]+[WW-II]+trans	0.245	3-7 = 0.003	2.785	-
4.	[MCQ-30: Pos]+[WW-II]+distrac	0.252	4-7 = 0.01	9.372*	0.01
5.	[MCQ-30: Pos]+[WW-II]+avoid	0.252	5-7 = 0.01	9.372*	0.01
6.	[MCQ-30: Pos]+[WW-II]+supp	0.257	6-7 = 0.015	14.152*	0.02
7.	[MCQ-30: Pos]+[WW-II]	0.242			
8.	[MCQ-30: Pos]+[CAQ]+[WW-II]	0.259	8-14 = 0.099	18.624*	0.13
9.	[MCQ-30: Pos]+[CAQ]+aids	0.202	9-14 = 0.042	36.895*	0.05
10.	[MCQ-30: Pos]+[CAQ]+motivate	0.239	10-14 = 0.079	72.771*	0.1
11.	[MCQ-30: Pos]+[CAQ]+protects	0.162	11-14 = 0.002	1.673	-
12.	[MCQ-30: Pos]+[CAQ]+prevents	0.192	12-14 = 0.032	27.762*	0.04
13.	[MCQ-30: Pos]+[CAQ]+positive	0.195	13-14 = 0.035	30.478*	0.04
14.	[MCQ-30: Pos]+[CAQ]	0.160			
15.	[WW-II]+[CAQ]+[MCQ-30: Pos]	0.259	15-16 = 0.004	3.762	-
16.	[WW-II]+[CAQ]	0.255			

Note: MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is apparent from Table 16 that all the scales measuring cognitive variables hypothesized to comprise the AMW together account for 25.9% of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level ($F_{11;694} = 22.059$).

Table 16 also indicates that the CAQ subscale scores together account for 1.7% ($F_{5;697} = 3.198$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size. Moreover, each of the three subscales of the CAQ independently accounts for a significant percentage (at the 1% level) of the variance in the female participants' PSWQ total score. More specifically, Distraction accounts for 1.0% ($F_{1;701} = 9.372$) of the variance, while Avoidance of Threatening Stimuli accounts for 1.0% ($F_{1;701} = 9.372$) of the variance and Thought Suppression accounts for 1.5% ($F_{1;701} = 14.152$) of the variance. However, the corresponding effect sizes indicate that these results are of limited practical importance.

According to Table 16, the WW-II subscale scores together account for 9.9% ($F_{5,697} = 18.624$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level and indicates a medium effect size. Moreover, four individual WW-II subscale scores independently account for a significant percentage (at the 1% level) of the variance in the female participants' PSWQ total score. More specifically, Worry Aids in Problem Solving accounts for 4.2% ($F_{1,701} = 36.895$), Worry helps Motivate accounts for 7.9% ($F_{1,701} = 72.771$), Worry Prevents Negative Outcomes accounts for 3.2% ($F_{1,701} = 27.762$) and Worry is a Positive Personality Trait accounts for 3.5% ($F_{1,701} = 30.478$) of the variance in the PSWQ total score. However, only the Worry helps Motivate subscale score yields a medium effect size. Consequently, while four of the WW-II subscale scores account for a significant percentage of the variance in the PSWQ total score, only that accounted for by the Worry helps Motivate subscale scores appears to be of practical importance.

It is also evident from Table 16 that the Positive Beliefs about Worry subscale score on the MCQ-30 accounts for 0.4% ($F_{1,697} = 3.762$) of the variance in the PSWQ total score of the female participants. However, this result is not significant at the 1% level.

The results of the hierarchical multiple regression analyses of the AMW for the male participants are reported in Table 17.

Table 17

Results of the Hierarchical Multiple Regression Analysis of the AMW for the Male Participants (n = 515) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1.	[MCQ-30: Pos]+[WW-II]+[CAQ]	0.336	1-7 = 0.039	5.909*	0.06
2.	[MCQ-30: Pos]+[WW-II]+sub	0.312	2-7 = 0.015	11.053*	0.02
3.	[MCQ-30: Pos]+[WW-II]+trans	0.308	3-7 = 0.011	8.059*	0.01
4.	[MCQ-30: Pos]+[WW-II]+distrac	0.302	4-7 = 0.005	13.731*	0.01
5.	[MCQ-30: Pos]+[WW-II]+avoid	0.324	5-7 = 0.027	20.25*	0.04
6.	[MCQ-30: Pos]+[WW-II]+supp	0.314	6-7 = 0.017	12.564*	0.02
7.	[MCQ-30: Pos]+[WW-II]	0.297			
8.	[MCQ-30: Pos]+[CAQ]+[WW-II]	0.336	8-14 = 0.1	15.151*	0.15
9.	[MCQ-30: Pos]+[CAQ]+aids	0.285	9-14 = 0.049	34.745*	0.07
10.	[MCQ-30: Pos]+[CAQ]+motivate	0.294	10-14 = 0.058	41.652*	0.08
11.	[MCQ-30: Pos]+[CAQ]+protects	0.261	11-14 = 0.025	17.152*	0.03
12.	[MCQ-30: Pos]+[CAQ]+prevents	0.260	12-14 = 0.024	16.443*	0.03
13.	[MCQ-30: Pos]+[CAQ]+positive	0.328	13-14 = 0.092	69.411*	0.14
14.	[MCQ-30: Pos]+[CAQ]	0.236			
15.	[WW-II]+[CAQ]+[MCQ-30: Pos]	0.336	15-16 = 0.002	1.515	-
16.	[WW-II]+[CAQ]	0.255			

Note: MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

According to Table 17, all the scales measuring cognitive variables hypothesized to comprise the AMW together account for 33.6% of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level ($F_{11,502} = 23.078$).

Table 17 also indicates that the CAQ subscales together account for 3.9% ($F_{5,503} = 5.909$) of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level but indicates a small effect size. Moreover, the individual CAQ subscale scores independently account for a significant percentage (at the 1% level) of the variance in the male participants' PSWQ total score. More specifically, Thought Substitution accounts for 1.5% ($F_{1,507} = 11.053$), Transformation of Images into Thoughts accounts for 1.1% ($F_{1,507} = 8.059$), Distraction accounts for 0.5% ($F_{1,507} = 13.731$), Avoidance of Threatening Stimuli scores account for 2.7% ($F_{1,507} = 20.25$) and Thought Suppression accounts for 1.7% ($F_{1,507} = 12.564$) of the variance in the PSWQ total score. Given the small effect sizes reported in

Table 17, these results, while statistically significant, appear to be of limited practical importance.

Table 17 indicates that the WW-II subscale scores together account for 10.0% of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level ($F_{5,503} = 15.151$) and indicates a medium effect size. In addition, all five of the WW-II subscales appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the male participants. Worry Aids in Problem Solving accounts for 4.9% ($F_{1,507} = 34.745$), Worry helps Motivate accounts for 5.8% ($F_{1,507} = 41.652$), Worry Protects from Difficult Emotions accounts for 2.5% ($F_{1,507} = 17.152$), Worry Prevents Negative Outcomes accounts for 2.4% ($F_{1,507} = 16.443$) and Worry is a Positive Personality Trait accounts for 9.2% ($F_{1,507} = 69.411$) of the variance. However, only the Worry helps Motivate and the Worry is a Positive Personality Trait subscale scores yield medium effect sizes. Consequently, while five of the WW-II subscale scores account for a significant percentage of the variance in PSWQ scores, only that accounted for by the Worry helps Motivate and the Worry is a Positive Personality Trait subscale scores appears to be of practical importance.

Table 17 also indicates that the Positive Beliefs about Worry subscale score on the MCQ-30 accounts for 0.2% ($F_{1,503} = 1.515$) of the variance in the PSWQ total score of the male participants. However, this result is not significant at the 1% level.

The results of the hierarchical multiple regression analyses of the AMW for the high-worry GAD participants are reported in Table 18.

Table 18

Results of the Hierarchical Multiple Regression Analysis of the AMW for the High-Worry GAD Participants (n = 70) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1.	[MCQ-30: Pos]+[WW-II]+[CAQ]	0.180	1-7 = 0.01	0.09	-
2.	[MCQ-30: Pos]+[WW-II]+sub	0.172	2-7 = 0.002	0.15	-
3.	[MCQ-30: Pos]+[WW-II]+trans	0.171	3-7 = 0.001	0.049	-
4.	[MCQ-30: Pos]+[WW-II]+distrac	0.173	4-7 = 0.003	0.149	-
5.	[MCQ-30: Pos]+[WW-II]+avoid	0.177	5-7 = 0.007	0.349	-
6.	[MCQ-30: Pos]+[WW-II]+supp	0.171	6-7 = 0.001	0.049	-
7.	[MCQ-30: Pos]+[WW-II]	0.170			
8.	[MCQ-30: Pos]+[CAQ]+[WW-II]	0.180	8-14 = 0.144	1.299	-
9.	[MCQ-30: Pos]+[CAQ]+aids	0.037	9-14 = 0.001	0.043	-
10.	[MCQ-30: Pos]+[CAQ]+motivate	0.101	10-14 = 0.065	2.964	-
11.	[MCQ-30: Pos]+[CAQ]+protects	0.054	11-14 = 0.018	0.780	-
12.	[MCQ-30: Pos]+[CAQ]+prevents	0.036	12-14 = 0	0	-
13.	[MCQ-30: Pos]+[CAQ]+positive	0.041	13-14 = 0.005	0.213	-
14.	[MCQ-30: Pos]+[CAQ]	0.036			
15.	[WW-II]+[CAQ]+ [MCQ-30: Pos]	0.180	15-16 = 0.03	2.122	-
16.	[WW-II]+[CAQ]	0.150			

Note: MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is evident from Table 18 that all the scales measuring cognitive variables hypothesized to comprise the AMW together account for 18.0% of the variance in the PSWQ total score of the high-worry GAD participants. This result is significant at the 1% level ($F_{11;57} = 1.134$).

Table 18 also indicates that the CAQ subscale scores together account for 1.0% ($F_{5;58} = 0.09$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. In addition, none of the individual CAQ subscale scores independently accounts for a significant percentage of the variance in the high-worry GAD participants' PSWQ total score.

It is also apparent from Table 18 that the WW-II subscale scores together account for 14.4% ($F_{5;58} = 1.299$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. In addition, none of the individual

WW-II subscale scores appears to account independently for significant percentages (at the 1% level) of the variance in the PSWQ total score of the high-worry GAD participants.

It is also evident from Table 18 that the Positive Beliefs About Worry subscale scores on the MCQ-30 accounts for 3.0% ($F_{1,58} = 2.122$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level.

The results of the hierarchical multiple regression analyses of the AMW for the high-worry non-GAD participants are reported in Table 19.

Table 19

Results of the Hierarchical Multiple Regression Analysis of the AMW for the High-Worry Non-GAD Participants (n = 49) with the PSWQ Total Score as the Criterion Variable

Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1. [MCQ-30: Pos]+[WW-II]+[CAQ]	0.159	1-7 = 0.045	0.621	-
2. [MCQ-30: Pos]+[WW-II]+sub	0.114	2-7 = 0	0	-
3. [MCQ-30: Pos]+[WW-II]+trans	0.142	3-7 = 0.028	2.023	-
4. [MCQ-30: Pos]+[WW-II]+distrac	0.125	4-7 = 0.011	0.779	-
5. [MCQ-30: Pos]+[WW-II]+avoid	0.140	5-7 = 0.026	1.874	-
6. [MCQ-30: Pos]+[WW-II]+supp	0.143	6-7 = 0.029	2.098	-
7. [MCQ-30: Pos]+[WW-II]	0.114			
8. [MCQ-30: Pos]+[CAQ]+[WW-II]	0.159	8-14 = 0.114	1.572	-
9. [MCQ-30: Pos]+[CAQ]+aids	0.045	9-14 = 0	0	-
10. [MCQ-30: Pos]+[CAQ]+motivate	0.051	10-14 = 0.006	0.392	-
11. [MCQ-30: Pos]+[CAQ]+protects	0.045	11-14 = 0	0	-
12. [MCQ-30: Pos]+[CAQ]+prevents	0.045	12-14 = 0	0	-
13. [MCQ-30: Pos]+[CAQ]+positive	0.097	13-14 = 0.052	3.570	-
14. [MCQ-30: Pos]+[CAQ]	0.045			
15. [WW-II]+[CAQ]+ [MCQ-30: Pos]	0.159	15-16 = 0.018	1.241	-
16. [WW-II]+[CAQ]	0.141			

Note: MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance; supp = thought suppression; aids = worry aids in problem -solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

Table 19 indicates that all the scales measuring cognitive variables hypothesized to comprise the AMW together account for 15.9% of the variance in the PSWQ total score of the high-worry non-GAD participants. This result is significant at the 1% level ($F_{11,37} = 0.637$).

It is apparent from Table 19 that the CAQ subscale scores together account for 4.5% ($F_{5,37} = 0.621$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual CAQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry non-GAD participants.

Table 19 also indicates that, together, the WW-II subscale scores account for 11.4% ($F_{5,37} = 1.572$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. In addition, none of the individual WW-II subscale scores accounts independently for a significant percentage of the variance in the high-worry non-GAD participants' PSWQ total score.

It is also evident from Table 19 that the Positive Beliefs About Worry subscale scores on the MCQ-30 account for 1.8% ($F_{1,37} = 1.241$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level.

The results of the hierarchical multiple regression analyses of the AMW for the low-worry participants are reported in Table 20.

Table 20

Results of the Hierarchical Multiple Regression Analysis of the AMW for the Low-Worry Participants (n = 1105) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1.	[MCQ-30: Pos]+[WW-II]+[CAQ]	0.244	1-7 = 0.018	5.205*	0.02
2.	[MCQ-30: Pos]+[WW-II]+sub	0.231	2-7 = 0.005	7.133*	0.01
3.	[MCQ-30: Pos]+[WW-II]+trans	0.233	3-7 = 0.007	10.012*	0.01
4.	[MCQ-30: Pos]+[WW-II]+distrac	0.234	4-7 = 0.008	11.457*	0.01
5.	[MCQ-30: Pos]+[WW-II]+avoid	0.240	5-7 = 0.014	20.208*	0.02
6.	[MCQ-30: Pos]+[WW-II]+supp	0.241	6-7 = 0.015	21.680*	0.02
7.	[MCQ-30: Pos]+[WW-II]	0.226			
8.	[MCQ-30: Pos]+[CAQ]+[WW-II]	0.244	8-14 = 0.08	23.132*	0.11
9.	[MCQ-30: Pos]+[CAQ]+aids	0.208	9-14 = 0.044	60.944*	0.06
10.	[MCQ-30: Pos]+[CAQ]+motivate	0.221	10-14 = 0.057	80.268*	0.07
11.	[MCQ-30: Pos]+[CAQ]+protects	0.167	11-14 = 0.003	3.951	-
12.	[MCQ-30: Pos]+[CAQ]+prevents	0.182	12-14 = 0.018	24.139*	0.02
13.	[MCQ-30: Pos]+[CAQ]+positive	0.208	13-14 = 0.044	60.944*	0.06
14.	[MCQ-30: Pos]+[CAQ]	0.164			
15.	[WW-II]+[CAQ]+[MCQ-30: Pos]	0.244	15-16 = 0.006	8.675*	0.01
16.	[WW-II]+[CAQ]	0.238			

Note: MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is apparent from Table 20 that all the scales measuring cognitive variables hypothesized to comprise the AMW together account for 24.4% ($F_{11;1090} = 32.029$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level.

Table 20 also indicates that the CAQ subscale scores together account for 1.8% ($F_{5;1093} = 5.205$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level but indicates a small effect size. Moreover, the individual CAQ subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the low-worry participants' PSWQ total score. More specifically, Thought Substitution accounts for 0.5% ($F_{1;1097} = 7.133$), Transformation of Images into Thoughts accounts for 0.7% ($F_{1;1097} = 10.012$), Distraction accounts for 0.8% ($F_{1;1097} = 11.457$), Avoidance of Threatening Stimuli accounts for 1.4% ($F_{1;1097} = 20.208$) and Thought Suppression accounts for 1.5% ($F_{1;1097} = 21.680$) of the variance in the PSWQ total score.

Given the small effect sizes reported in Table 20, these results, while statistically significant, appear to be of limited practical importance.

It is also apparent from Table 20 that the WW-II subscale scores together account for 8.0% ($F_{5;1093} = 23.132$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level and indicates a medium effect size. In addition, four of the WW-II subscales appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the low-worry participants. Worry Aids in Problem Solving accounts for 4.4% ($F_{1;1097} = 60.944$), Worry helps Motivate accounts for 5.7% ($F_{1;1097} = 80.268$), Worry Prevents Negative Outcomes accounts for 1.8% ($F_{1;1097} = 24.139$) and Worry is a Positive Personality Trait accounts for 4.4% ($F_{1;1097} = 60.944$) of the variance. However, the corresponding effect sizes indicate that these results are of limited practical importance.

Table 20 also indicates that the Positive Beliefs about Worry subscale score on the MCQ-30 accounts for 0.6% ($F_{1;1093} = 8.675$) of the variance in the PSWQ total score of the low-worry participants. Given the small effect size reported in Table 20, this result, while statistically significant, appears to be of limited practical value.

It was mentioned previously that results considered to be of practical importance (i.e. indicating a medium to large effect size) would be highlighted. In this regard, the results of the hierarchical regression analyses for the AMW suggest that the WW-II total score accounts for a significant amount of the variance in the PSWQ total score of the total sample, the female participants, the male participants and the low-worry participants. All these results indicate medium effect sizes and can thus be considered to be of practical importance. In addition, the WW-II Worry helps Motivate subscale scores account for a significant percentage of the variance in the PSWQ total score of the total sample, the female participants and the male participants. These results are also indicative of medium effect sizes and thus considered to be of practical importance. The Worry is a Positive Personality Trait subscale score from the WW-II accounts for a significant amount of the variance of the PSWQ total score of the male participants. This result is considered to be of practical importance, as it indicates a medium effect size.

6.5.2 Metacognitive model of GAD (MCM)

Hierarchical multiple regression analyses were conducted with respect to the MCM to determine whether the TCQ subscale scores, the MWQ subscale scores, the MCQ-30 subscale scores, and the WW-II subscale scores (predictor variables) account for a significant percentage of the variance in the PSWQ total score (criterion variable). These analyses were performed for the total sample, as well as for gender and worry/GAD status (low worry, high-worry non-GAD and high-worry GAD) independently. The results of the regression analysis for the total sample are reported in Table 21.

Table 21

Results of the Hierarchical Multiple Regression Analysis of the MCM for the Total Sample (N = 1224) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1.	[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.380	1-7 = 0.006	2.334	-
2.	[WW-II]+[MCQ-30]+[MWQ]+distraction	0.374	2-7 = 0	0	-
3.	[WW-II]+[MCQ-30]+[MWQ]+social control	0.376	3-7 = 0.002	3.878	-
4.	[WW-II]+[MCQ-30]+[MWQ]+worry	0.374	4-7 = 0	0	-
5.	[WW-II]+[MCQ-30]+[MWQ]+punishment	0.374	5-7 = 0	0	-
6.	[WW-II]+[MCQ-30]+[MWQ]+re-appraisal	0.374	6-7 = 0	0	-
7.	[WW-II]+[MCQ-30]+[MWQ]	0.374			
8.	[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.38	8-11 = 0.022	21.397*	0.04
9.	[WW-II]+[MCQ-30]+[TCQ]+MWQ: Frequency	0.371	9-11 = 0.013	24.946*	0.02
10.	[WW-II]+[MCQ-30]+[TCQ]+MWQ: Belief	0.378	10-11 = 0.02	38.810*	0.03
11.	[WW-II]+[MCQ-30]+[TCQ]	0.358			
12.	[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.38	12-18 = 0.048	18.674*	0.08
13.	[WW-II]+[MWQ]+[TCQ]+positive beliefs	0.332	13-18 = 0	0	-
14.	[WW-II]+[MWQ]+[TCQ]+negative beliefs	0.365	14-18 = 0.033	62.882*	0.05
15.	[WW-II]+[MWQ]+[TCQ]+cognitive confidence	0.332	15-18 = 0	0	-
16.	[WW-II]+[MWQ]+[TCQ]+need to control thoughts	0.332	16-18 = 0	0	-
17.	[WW-II]+[MWQ]+[TCQ]+cognitive self-conscious	0.334	17-18 = 0.002	3.634	-
18.	[WW-II]+[MWQ]+[TCQ]	0.332			
19.	[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.38	19-25 = 0.098	38.125*	0.16
20.	[MCQ-30]+[MWQ]+[TCQ]+aids	0.321	20-25 = 0.039	69.499*	0.06
21.	[MCQ-30]+[MWQ]+[TCQ]+motivate	0.356	21-25 = 0.074	139.037*	0.11
22.	[MCQ-30]+[MWQ]+[TCQ]+protects	0.297	22-25 = 0.015	25.818*	0.02
23.	[MCQ-30]+[MWQ]+[TCQ]+prevents	0.284	23-25 = 0.002	3.38	-
24.	[MCQ-30]+[MWQ]+[TCQ]+positive	0.333	24-25 = 0.051	92.519*	0.08
25.	[MCQ-30]+[MWQ]+[TCQ]	0.282			

Note: WW-II = Why Worry II Scale; MCQ-30 = Meta-cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; positive beliefs = positive beliefs about worry; negative beliefs = negative beliefs about thoughts concerning uncontrollability and danger; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is apparent from Table 21 that all the scales measuring cognitive variables hypothesized to comprise the MCM together account for 38.0% of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level ($F_{17,1202} = 43.383$).

Table 21 also indicates that the TCQ subscale scores together account for 0.6% ($F_{5,1206} = 2.334$) of the variance in the PSWQ total score of the total sample. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale scores

independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the total sample.

It is evident from Table 21 that the MWQ subscale scores together account for 2.2% ($F_{2;1206} = 21.397$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size. It is also apparent from the results in Table 21 that both the MWQ subscale scores appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the total sample. The MWQ Frequency subscale score accounts for 1.3% ($F_{1;1207} = 24.946$), and the MWQ Belief subscale score accounts for 2.0% ($F_{1;1207} = 38.810$) of the variance in the PSWQ total score of the total sample. Given the small effect sizes reported in Table 21, these results, while statistically significant, appear to be of limited practical importance.

Table 21 indicates that the MCQ-30 subscale scores together account for 4.8% ($F_{5;1206} = 18.674$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level and indicates a medium effect size. Moreover, one individual MCQ-30 subscale score (Negative Beliefs about Thoughts Concerning Uncontrollability and Danger) independently accounts for 3.3% ($F_{1;1210} = 62.882$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size.

It is also evident from Table 21 that the WW-II subscale scores together account for 9.8% ($F_{5;1206} = 38.125$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level and indicates a medium effect size. In addition, four of the WW-II subscale scores appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the total sample. Worry Aids in Problem Solving accounts for 3.9% ($F_{1;1210} = 69.499$), Worry helps Motivate accounts for 7.4% ($F_{1;1210} = 139.039$), Worry Protects from Difficult Emotions accounts for 1.5% ($F_{1;1210} = 25.818$) and Worry is a Positive Personality Trait accounts for 5.1% ($F_{1;1210} = 92.519$) of the variance. However, only the Worry helps Motivate and Worry is a Positive Personality Trait subscale scores yield a medium effect size. Consequently, while four of the WW-II subscale scores account for a significant percentage of the variance in PSWQ scores, only the variance accounted for by the Worry helps Motivate and Worry is a Positive Personality Trait subscale scores appears to be of practical importance.

Moderated multiple regression analyses in section 6.3.2 revealed that only gender and worry/GAD status moderate the relationship between the predictor variables relevant to the MCM and worry intensity. Consequently, in addition to conducting hierarchical multiple regression analyses for the total sample, it was also necessary to conduct these analyses for gender and worry/GAD status. The results of the hierarchical multiple regression analyses of the MCM for the female participants are reported in Table 22.

Table 22

Results of the Hierarchical Multiple Regression Analysis of the MCM for the Female Participants (n = 709) with the PSWQ Total Score as the Criterion Variable

Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1. [WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.385	1-7 = 0.007	1.573	-
2. [WW-II]+[MCQ-30]+[MWQ]+distraction	0.378	2-7 = 0	0	-
3. [WW-II]+[MCQ-30]+[MWQ]+social control	0.379	3-7 = 0.001	1.119	-
4. [WW-II]+[MCQ-30]+[MWQ]+worry	0.38	4-7 = 0.002	2.242	-
5. [WW-II]+[MCQ-30]+[MWQ]+punishment	0.378	5-7 = 0	0	-
6. [WW-II]+[MCQ-30]+[MWQ]+re-appraisal	0.379	6-7 = 0.001	1.119	-
7. [WW-II]+[MCQ-30]+[MWQ]	0.378			
8. [WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.385	8-11 = 0.027	15.168*	0.04
9. [WW-II]+[MCQ-30]+[TCQ]+MWQ: Frequency	0.377	9-11 = 0.019	21.104*	0.03
10. [WW-II]+[MCQ-30]+[TCQ]+MWQ: Belief	0.381	10-11 = 0.023	25.712*	0.04
11. [WW-II]+[MCQ-30]+[TCQ]	0.358			
12. [WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.385	12-18 = 0.035	7.865*	0.06
13. [WW-II]+[MWQ]+[TCQ]+positive beliefs	0.351	13-18 = 0.001	1.071	-
14. [WW-II]+[MWQ]+[TCQ]+negative beliefs	0.374	14-18 = 0.024	26.645*	0.04
15. [WW-II]+[MWQ]+[TCQ]+cognitive confidence	0.35	15-18 = 0	0	-
16. [WW-II]+[MWQ]+[TCQ]+need to control thoughts	0.35	16-18 = 0	0	-
17. [WW-II]+[MWQ]+[TCQ]+cognitive self-conscious	0.351	17-18 = 0.001	1.071	-
18. [WW-II]+[MWQ]+[TCQ]	0.35			
19. [MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.385	19-25 = 0.089	19.999*	0.14
20. [MCQ-30]+[MWQ]+[TCQ]+aids	0.332	20-25 = 0.036	37.455*	0.05
21. [MCQ-30]+[MWQ]+[TCQ]+motivate	0.365	21-25 = 0.069	75.520*	0.11
22. [MCQ-30]+[MWQ]+[TCQ]+protects	0.312	22-25 = 0.016	16.163*	0.02
23. [MCQ-30]+[MWQ]+[TCQ]+prevents	0.297	23-25 = 0.001	0.989	-
24. [MCQ-30]+[MWQ]+[TCQ]+positive	0.331	24-25 = 0.035	36.360*	0.05
25. [MCQ-30]+[MWQ]+[TCQ]	0.296			

Note: WW-II = Why Worry II Scale; MCQ-30 = Meta-cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; positive beliefs = positive beliefs about worry; negative beliefs = negative beliefs about thoughts concerning uncontrollability and danger; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

According to Table 22, all the scales measuring cognitive variables hypothesized to comprise the MCM together account for 38.5% of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level ($F_{17;688} = 25.294$).

It is also apparent from Table 22 that the TCQ subscale scores together account for 0.7% ($F_{5;691} = 1.573$) of the variance in the PSWQ total score of the female participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale scores independently accounts for a significant (at the 1% level) percentage of the variance in the female participants' PSWQ total score.

The results in Table 22 indicates that the MWQ subscale scores together account for 2.7% ($F_{2;691} = 15.168$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size. It is also apparent from the results in Table 22 that both the MWQ subscale scores appear to account individually for significant (at the 1% level) percentages of the variance in the PSWQ total score of the female participants. The MWQ: Frequency subscale score accounts for 1.9% ($F_{1;692} = 21.104$) and the MWQ: Belief subscale score accounts for 2.3% ($F_{1;692} = 25.712$) of the variance in the PSWQ total score of the female participants. Given the small effect sizes reported in Table 22, these results, while statistically significant, appear to be of limited practical importance.

Table 22 indicates that the MCQ-30 subscale scores together account for 3.5% ($F_{5;691} = 7.865$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size. Moreover, one individual MCQ-30 subscale score (Negative Beliefs about Thoughts Concerning Uncontrollability and Danger) independently accounts for 2.4% ($F_{1;695} = 26.645$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size.

It is also apparent from Table 22 that the WW-II subscale scores together account for 8.9% ($F_{5;691} = 19.999$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level and indicates a medium effect size. In addition, four of the WW-II subscale scores appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the female participants. Worry Aids in

Problem Solving accounts for 3.6% ($F_{1,695} = 37.455$), Worry helps Motivate accounts for 6.9% ($F_{1,695} = 75.520$), Worry Protects from Difficult Emotions accounts for 1.6% ($F_{1,695} = 16.163$) and Worry is a Positive Personality Trait accounts for 3.5% ($F_{1,695} = 36.360$) of the variance. However, only the Worry helps Motivate subscale score yields a medium effect size. Consequently, while four of the WW-II subscale scores account for a significant percentage of the variance in PSWQ scores, only the variance accounted for by the Worry helps Motivate subscale score appears to be of practical importance.

The results of the hierarchical multiple regression analyses of the MCM for the male participants are reported in Table 23.

Table 23

Results of the Hierarchical Multiple Regression Analysis of the MCM for the Male Participants (n = 515) with the PSWQ Total Score as the Criterion Variable

Predictor variables	R ²	Contributes to R ² (Complete - decreased model)	F	f ²
1. [WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.416	1-7 = 0.006	1.021	-
2. [WW-II]+[MCQ-30]+[MWQ]+distraction	0.41	2-7 = 0	0	-
3. [WW-II]+[MCQ-30]+[MWQ]+social control	0.414	3-7 = 0.004	3.42	-
4. [WW-II]+[MCQ-30]+[MWQ]+worry	0.41	4-7 = 0	0	-
5. [WW-II]+[MCQ-30]+[MWQ]+punishment	0.411	5-7 = 0.001	0.851	-
6. [WW-II]+[MCQ-30]+[MWQ]+re-appraisal	0.41	6-7 = 0	0	-
7. [WW-II]+[MCQ-30]+[MWQ]	0.41			
8. [WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.416	8-11 = 0.019	8.085*	0.03
9. [WW-II]+[MCQ-30]+[TCQ]+MWQ: Frequency	0.406	9-11 = 0.009	7.545*	0.02
10. [WW-II]+[MCQ-30]+[TCQ]+MWQ: Belief	0.414	10-11 = 0.017	14.447*	0.03
11. [WW-II]+[MCQ-30]+[TCQ]	0.397			
12. [WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.416	12-18 = 0.044	7.489*	0.08
13. [WW-II]+[MWQ]+[TCQ]+positive beliefs	0.373	13-18 = 0.001	0.799	-
14. [WW-II]+[MWQ]+[TCQ]+negative beliefs	0.413	14-18 = 0.041	34.993*	0.07
15. [WW-II]+[MWQ]+[TCQ]+cognitive confidence	0.376	15-18 = 0.004	3.211	-
16. [WW-II]+[MWQ]+[TCQ]+need to control thoughts	0.375	16-18 = 0.003	2.405	-
17. [WW-II]+[MWQ]+[TCQ]+cognitive self-conscious	0.376	17-18 = 0.004	3.211	-
18. [WW-II]+[MWQ]+[TCQ]	0.372			
19. [MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.416	19-25 = 0.102	17.361*	0.17
20. [MCQ-30]+[MWQ]+[TCQ]+aids	0.365	20-25 = 0.051	40.238*	0.08
21. [MCQ-30]+[MWQ]+[TCQ]+motivate	0.377	21-25 = 0.063	50.663*	0.1
22. [MCQ-30]+[MWQ]+[TCQ]+protects	0.337	22-25 = 0.023	17.380*	0.03
23. [MCQ-30]+[MWQ]+[TCQ]+prevents	0.336	23-25 = 0.022	16.599*	0.03
24. [MCQ-30]+[MWQ]+[TCQ]+positive	0.405	24-25 = 0.091	76.624*	0.15
25. [MCQ-30]+[MWQ]+[TCQ]	0.314			

Note: WW-II = Why Worry II Scale; MCQ-30 = Meta-cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; positive beliefs = positive beliefs about worry; negative beliefs = negative beliefs about thoughts concerning uncontrollability and danger; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is evident from Table 23 that all the scales measuring cognitive variables hypothesized to comprise the MCM together account for 41.6% of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level ($F_{17;496} = 20.773$).

It is also apparent from Table 23 that the TCQ subscale scores together account for 0.6% ($F_{5;497} = 1.021$) of the variance in the PSWQ total score of the male participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale

scores independently accounts for a significant percentage (at the 1% level) of the variance in the male participants' PSWQ total score.

Table 23 indicates that the MWQ subscale scores together account for 1.9% ($F_{2,497} = 8.085$) of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level but indicates a small effect size. It is also apparent from the results in Table 23 that both the MWQ subscale scores appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ score of the male participants. The MWQ: Frequency subscale score accounts for 0.9% ($F_{1,498} = 7.545$), and the MWQ: Belief subscale score accounts for 1.7% ($F_{1,498} = 14.447$) of the variance in the PSWQ total score of the male participants. Given the small effect sizes reported in Table 23, these results, while statistically significant, appear to be of limited practical importance.

Table 23 indicates that the MCQ-30 subscale scores together account for 4.4% ($F_{5,497} = 7.489$) of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level and indicates a medium effect size. Moreover, one individual MCQ-30 subscale score (Negative Beliefs about Thoughts Concerning Uncontrollability and Danger) independently accounts for 4.1% ($F_{1,501} = 34.993$) of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level but indicates a small effect size.

It is also apparent from Table 23 that the WW-II subscale scores together account for 10.2% ($F_{5,497} = 17.361$) of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level and indicates a medium effect size. In addition, the individual WW-II subscale scores independently accounts for a significant percentage of the variance in the male participants' PSWQ total score. More specifically, Worry Aids in Problem Solving accounts for 5.1% ($F_{1,501} = 40.238$), Worry helps Motivate accounts for 6.3% ($F_{1,501} = 50.663$), Worry Protects from Difficult Emotions accounts for 2.3% ($F_{1,501} = 17.380$), Worry Prevents Negative Outcomes accounts for 2.2% ($F_{1,501} = 16.599$) and Worry is a Positive Personality Trait accounts for 9.1% ($F_{1,501} = 76.624$) of the variance in the PSWQ total score of the male participants. However, only the Aid in Problem Solving, Worry helps Motivate and Worry is a Positive Personality Trait subscale scores yield medium effect sizes. Consequently, while all five of the WW-II subscale scores account for a significant

percentage of the variance in PSWQ scores, only the variance accounted for by the Worry Aids in Problem Solving, Worry helps Motivate and Worry is a Positive Personality Trait subscale scores appears to be of practical importance.

The results of the hierarchical multiple regression analyses of the MCM for the high-worry GAD participants are reported in Table 24.

Table 24

Results of the Hierarchical Multiple Regression Analysis of the MCM for the High-Worry GAD Participants (n = 70) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1.	[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.422	1-7 = 0.045	0.81	-
2.	[WW-II]+[MCQ-30]+[MWQ]+distraction	0.38	2-7 = 0.003	0.271	-
3.	[WW-II]+[MCQ-30]+[MWQ]+social control	0.388	3-7 = 0.011	1.007	-
4.	[WW-II]+[MCQ-30]+[MWQ]+worry	0.381	4-7 = 0.004	0.362	-
5.	[WW-II]+[MCQ-30]+[MWQ]+punishment	0.395	5-7 = 0.018	1.666	-
6.	[WW-II]+[MCQ-30]+[MWQ]+re-appraisal	0.38	6-7 = 0.003	0.271	-
7.	[WW-II]+[MCQ-30]+[MWQ]	0.377			
8.	[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.422	8-11 = 0.064	2.879	-
9.	[WW-II]+[MCQ-30]+[TCQ]+MWQ: Frequency	0.416	9-11 = 0.058	5.263	-
10.	[WW-II]+[MCQ-30]+[TCQ]+MWQ: Belief	0.406	10-11 = 0.048	4.283	-
11.	[WW-II]+[MCQ-30]+[TCQ]	0.358			
12.	[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.422	12-18 = 0.081	1.457	-
13.	[WW-II]+[MWQ]+[TCQ]+positive beliefs	0.345	13-18 = 0.004	0.342	-
14.	[WW-II]+[MWQ]+[TCQ]+negative beliefs	0.344	14-18 = 0.003	0.256	-
15.	[WW-II]+[MWQ]+[TCQ]+cognitive confidence	0.401	15-18 = 0.06	5.609	-
16.	[WW-II]+[MWQ]+[TCQ]+need to control thoughts	0.341	16-18 = 0	0	-
17.	[WW-II]+[MWQ]+[TCQ]+cognitive self-consciousness	0.341	17-18 = 0	0	-
18.	[WW-II]+[MWQ]+[TCQ]	0.341			
19.	[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.422	19-25 = 0.133	2.393	-
20.	[MCQ-30]+[MWQ]+[TCQ]+aids	0.296	20-25 = 0.007	0.557	-
21.	[MCQ-30]+[MWQ]+[TCQ]+motivate	0.363	21-25 = 0.074	6.505	-
22.	[MCQ-30]+[MWQ]+[TCQ]+protects	0.298	22-25 = 0.009	0.718	-
23.	[MCQ-30]+[MWQ]+[TCQ]+prevents	0.304	23-25 = 0.015	1.207	-
24.	[MCQ-30]+[MWQ]+[TCQ]+positive	0.29	24-25 = 0.001	0.079	-
25.	[MCQ-30]+[MWQ]+[TCQ]	0.289			

Note: WW-II = Why Worry II Scale; MCQ-30 = Meta-cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; positive beliefs = positive beliefs about worry; negative beliefs = negative beliefs about thoughts concerning uncontrollability and danger; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is apparent from Table 24 that all the scales measuring cognitive variables hypothesized to comprise the MCM together account for 42.2% of the variance in the PSWQ total score of the high-worry GAD participants. This result is significant at the 1% level ($F_{17;51} = 2.187$).

Table 24 also indicates that the TCQ subscale scores together account for 4.5% ($F_{5;52} = 0.810$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ

subscale scores independently accounts for a significant (at the 1% level) percentage of the variance in the high-worry GAD participants' PSWQ total score.

It is evident from Table 24 that the MWQ subscale scores together account for 6.4% ($F_{2,52} = 2.879$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual MWQ subscale scores independently accounts for a significant (at the 1% level) percentage of the variance in the high-worry GAD participants' PSWQ total score.

Table 24 indicates that the MCQ-30 subscale scores together account for 8.1% ($F_{5,52} = 1.457$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. In addition, none of the individual MCQ-30 subscales scores independently accounts for a significant (at the 1% level) percentage of the variance in the PSWQ total score of the high-worry GAD participants.

It is also evident from Table 24 that the WW-II subscale scores together account for 13.3% ($F_{5,52} = 2.393$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. Table 24 also indicates that none of the individual WW-II subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry GAD participants.

The results of the hierarchical multiple regression analyses of the MCM for the high-worry non-GAD participants are reported in Table 25.

Table 25

Results of the Hierarchical Multiple Regression Analysis of the MCM for the High-Worry Non-GAD Participants (n = 49) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete - decreased model)	F	f ²
1.	[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.328	1-7 = 0.086	0.793	-
2.	[WW-II]+[MCQ-30]+[MWQ]distraction	0.28	2-7 = 0.038	1.847	-
3.	[WW-II]+[MCQ-30]+[MWQ]+social control	0.244	3-7 = 0.002	0.093	-
4.	[WW-II]+[MCQ-30]+[MWQ]+worry	0.244	4-7 = 0.002	0.093	-
5.	[WW-II]+[MCQ-30]+[MWQ]+punishment	0.244	5-7 = 0.002	0.093	-
6.	[WW-II]+[MCQ-30]+[MWQ]+re-appraisal	0.32	6-7 = 0.078	4.015	-
7.	[WW-II]+[MCQ-30]+[MWQ]	0.242			
8.	[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.328	8-11 = 0.003	0.069	-
9.	[WW-II]+[MCQ-30]+[TCQ]+MWQ: Freq	0.326	9-11 = 0.001	0.047	-
10.	[WW-II]+[MCQ-30]+[TCQ]+MWQ: Belief	0.328	10-11 = 0.003	0.143	-
11.	[WW-II]+[MCQ-30]+[TCQ]	0.325			
12.	[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.328	12-18 = 0.1	0.923	-
13.	[WW-II]+[MWQ]+[TCQ]+positive beliefs	0.272	13-18 = 0.044	2.115	-
14.	[WW-II]+[MWQ]+[TCQ]+negative beliefs	0.231	14-18 = 0.003	0.137	-
15.	[WW-II]+[MWQ]+[TCQ]+cognitive conf	0.229	15-18 = 0.001	0.045	-
16.	[WW-II]+[MWQ]+[TCQ]+need to control th	0.261	16-18 = 0.033	1.563	-
17.	[WW-II]+[MWQ]+[TCQ]+cognitive self-cons	0.245	17-18 = 0.017	0.788	-
18.	[WW-II]+[MWQ]+[TCQ]	0.228			
19.	[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.328	19-25 = 0.069	0.637	-
20.	[MCQ-30]+[MWQ]+[TCQ]+aids	0.261	20-25 = 0.002	0.095	-
21.	[MCQ-30]+[MWQ]+[TCQ]+motivate	0.261	21-25 = 0.002	0.095	-
22.	[MCQ-30]+[MWQ]+[TCQ]+protects	0.272	22-25 = 0.013	0.625	-
23.	[MCQ-30]+[MWQ]+[TCQ]+prevents	0.275	23-25 = 0.016	0.772	-
24.	[MCQ-30]+[MWQ]+[TCQ]+positive	0.262	24-25 = 0.003	0.142	-
25.	[MCQ-30]+[MWQ]+[TCQ]	0.259			

Note: WW-II = Why Worry II Scale; MCQ-30 = Meta-cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; positive beliefs = positive beliefs about worry; negative beliefs = negative beliefs about thoughts concerning uncontrollability and danger; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

According to Table 25, all the scales measuring cognitive variables hypothesized to comprise the MCM together account for 32.8% of the variance in the PSWQ total score of the high-worry non-GAD participants. This result is significant at the 1% level ($F_{17,31} = 0.890$).

It is also evident from Table 25 that the TCQ subscale scores together account for 8.6% ($F_{5,31} = 0.793$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ

subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the high-worry non-GAD participants' PSWQ total score.

Table 25 indicates that the MWQ subscale scores together account for 0.3% ($F_{2,31} = 0.069$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual MWQ subscale scores independently accounts for a significant percentage of the variance in the high-worry non-GAD participants' PSWQ total score.

Table 25 indicates that the MCQ-30 subscale scores together account for 10.0% ($F_{5,31} = 0.923$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. In addition, none of the individual MCQ-30 subscale scores independently accounts for a significant (at the 1% level) percentage of the variance in the PSWQ total score of the high-worry non-GAD participants.

It is also evident from Table 25 that the WW-II subscale scores together account for 6.9% ($F_{5,31} = 0.637$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. Table 25 also indicates that none of the individual WW-II subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry non-GAD participants.

The results of the hierarchical multiple regression analyses of the MCM for the low-worry participants are reported in Table 26.

Table 26

Results of the Hierarchical Multiple Regression Analysis of the MCM for the Low-Worry Participants (n = 1105) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1.	[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.321	1-7 = 0.004	1.281	-
2.	[WW-II]+[MCQ-30]+[MWQ]+distraction	0.318	2-7 = 0.001	1.6	-
3.	[WW-II]+[MCQ-30]+[MWQ]+social control	0.32	3-7 = 0.003	4.813	-
4.	[WW-II]+[MCQ-30]+[MWQ]+worry	0.318	4-7 = 0.001	1.6	-
5.	[WW-II]+[MCQ-30]+[MWQ]+punishment	0.318	5-7 = 0.001	1.6	-
6.	[WW-II]+[MCQ-30]+[MWQ]+re-appraisal	0.318	6-7 = 0.001	1.6	-
7.	[WW-II]+[MCQ-30]+[MWQ]	0.317			
8.	[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.321	8-11 = 0.025	20.011*	0.04
9.	[WW-II]+[MCQ-30]+[TCQ]+MWQ: Frequency	0.311	9-11 = 0.015	23.687*	0.02
10.	[WW-II]+[MCQ-30]+[TCQ]+MWQ: Belief	0.318	10-11 = 0.022	35.097*	0.03
11.	[WW-II]+[MCQ-30]+[TCQ]	0.296			
12.	[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.321	12-18 = 0.024	7.684*	0.04
13.	[WW-II]+[MWQ]+[TCQ]+positive beliefs	0.299	13-18 = 0.002	3.113	-
14.	[WW-II]+[MWQ]+[TCQ]+negative beliefs	0.317	14-18 = 0.02	31.947*	0.03
15.	[WW-II]+[MWQ]+[TCQ]+cognitive confidence	0.297	15-18 = 0	0	-
16.	[WW-II]+[MWQ]+[TCQ]+need to control thoughts	0.297	16-18 = 0	0	-
17.	[WW-II]+[MWQ]+[TCQ]+cognitive self-consciousness	0.298	17-18 = 0.001	1.554	-
18.	[WW-II]+[MWQ]+[TCQ]	0.297			
19.	[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.321	19-25 = 0.092	29.456*	0.14
20.	[MCQ-30]+[MWQ]+[TCQ]+aids	0.271	20-25 = 0.042	62.856*	0.06
21.	[MCQ-30]+[MWQ]+[TCQ]+motivate	0.296	21-25 = 0.067	103.831*	0.1
22.	[MCQ-30]+[MWQ]+[TCQ]+protects	0.241	22-25 = 0.012	17.249*	0.02
23.	[MCQ-30]+[MWQ]+[TCQ]+prevents	0.232	23-25 = 0.003	4.252	-
24.	[MCQ-30]+[MWQ]+[TCQ]+positive	0.277	24-25 = 0.048	72.432*	0.07
25.	[MCQ-30]+[MWQ]+[TCQ]	0.229			

Note: WW-II = Why Worry II Scale; MCQ-30 = Meta-cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; positive beliefs = positive beliefs about worry; negative beliefs = negative beliefs about thoughts concerning uncontrollability and danger; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is evident from Table 26 that all the scales measuring cognitive variables hypothesized to comprise the MCM together account for 32.1% of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level ($F_{17,1084} = 30.127$).

Table 26 also indicates that the TCQ subscale scores together account for 0.4% ($F_{5,1087} = 1.281$) of the variance in the PSWQ total score of the low-worry participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale

scores independently accounts for a significant percentage (at the 1% level) of the variance in the low-worry participants' PSWQ total score.

It is evident from Table 26 that the MWQ subscale scores together account for 2.5% ($F_{2,1087} = 20.011$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level but indicates a small effect size. It is also apparent from the results in Table 26 that both the MWQ subscale scores appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the low-worry participants. The MWQ: Frequency subscale score accounts for 1.5% ($F_{1,1088} = 23.687$) and the MWQ: Belief subscale score accounts for 2.2% ($F_{1,1088} = 35.097$) of the variance in the PSWQ total score of the low-worry participants. Given the small effect sizes reported in Table 26, these results, while statistically significant (at the 1% level), appear to be of limited practical importance.

Table 26 indicates that the MCQ-30 subscale scores together account for 2.4% ($F_{5,1087} = 7.684$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level but indicates a small effect size. Moreover, one individual MCQ-30 subscale score (Negative Beliefs about Thoughts Concerning Uncontrollability and Danger) independently accounts for 2.0% ($F_{1,1091} = 31.947$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level but indicates a small effect size.

It is also apparent from Table 26 that the WW-II subscale scores together account for 9.2% ($F_{5,1087} = 29.456$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level and indicates a medium effect size. In addition, four of the WW-II subscale scores appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the low-worry participants. Worry Aids in Problem Solving accounts for 4.2% ($F_{1,1091} = 62.856$), Worry helps Motivate accounts for 6.7% ($F_{1,1091} = 103.831$), Worry Protects from Difficult Emotions accounts for 1.2% ($F_{1,1091} = 17.249$) and Worry is a Positive Personality Trait accounts for 4.8% ($F_{1,1091} = 10.714$) of the variance. However, only the Worry helps Motivate subscale score yields a medium effect size. Consequently, while four of the WW-II subscales scores account for a significant

percentage (at the 1% level) of the variance in PSWQ scores, only the variance accounted for by the Worry helps Motivate subscale score appears to be of practical importance.

It was mentioned previously that results considered to be of practical importance (i.e. indicating a medium to large effect size) would be highlighted. In this regard, the results of the hierarchical regression analyses for the MCM suggest that the WW-II total score accounts for a significant amount of the variance in the PSWQ total score of the total sample, the female participants, the male participants and the low-worry participants. All these results indicate medium effect sizes and can thus be considered to be of practical importance. In addition, the WW-II Worry helps Motivate subscale scores account for a significant percentage of the variance in the PSWQ total score of the total sample, the female participants, the male participants and the low worry individuals. These results are also indicative of medium effect sizes and thus considered to be of practical importance. The WW-II Worry is a Positive Personality Trait subscale score accounts for a significant amount of the variance of the PSWQ total score of the total sample, as well as the male participants. These results are considered to be of practical importance, as they indicate a medium effect size. Furthermore, the Worry Aids in Problem Solving subscale score accounts for a significant amount of the variance in the PSWQ total score of the male participants. This result indicates a medium effect size. Lastly, the MCQ-30 total scores account for a significant amount of the variance in the PSWQ total score for the total sample and among the male participants. These results are of practical importance, as they indicate medium effect sizes.

6.5.3 Intolerance of uncertainty model (IUM)

Hierarchical multiple regression analyses were conducted with respect to the IUM to determine whether the CAQ subscale scores, the WW-II subscale scores, the NPOQ total score, the Positive Beliefs about Worry subscale score on the MCQ-30 and the IUS total score (predictor variables) account for a significant percentage of the variance in the PSWQ score (criterion variable). These analyses were performed for the total sample, as well as for gender and worry/GAD status (low worry, high-worry non-GAD and high-worry GAD) independently. The results of the regression analysis for the total sample are reported in Table 27.

Table 27

Results of the Hierarchical Multiple Regression Analysis of the IUM for the Total Sample (N = 1224) with the PSWQ Total Score as the Criterion Variable

Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.353	1-7 = 0.015	5.610*	0.02
2. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+sub	0.341	2-7 = 0.003	5.527	-
3. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+trans	0.338	3-7 = 0	0	0
4. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+distrac	0.338	4-7 = 0	0	0
5. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+avoid	0.34	5-7 = 0.002	3.679	-
6. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+supp	0.344	6-7 = 0.006	11.104*	0.01
7. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]	0.338			
8. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+[WW-II]	0.353	8-14 = 0.066	24.686*	0.1
9. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+aids	0.312	9-14 = 0.025	44.113*	0.04
10. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+motivate	0.333	10-14 = 0.046	83.724*	0.07
11. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+protects	0.296	11-14 = 0.009	15.520*	0.01
12. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+prevents	0.287	12-14 = 0	0	0
13. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+positive	0.318	13-14 = 0.031	55.182*	0.05
14. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]	0.287			
15. [IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]+[NPO]	0.353	15-16 = 0.033	61.716*	0.05
16. [IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]	0.32			
17. [IUS]+[NPO]+[WW-II]+[CAQ]+[MCQ-30: Pos]	0.353	17-18 = 0.001	1.87	-
18. [IUS]+[NPO]+[WW-II]+[CAQ]	0.352			
19. [MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]+[IUS]	0.353	19-20 = 0.023	43.014*	0.04
20. [MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.33			

Note: IUS = Intolerance of Uncertainty Scale; MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; NPO = Negative Problem Orientation Questionnaire; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is apparent from Table 27 that all the scales measuring cognitive variables hypothesized to comprise the IUM together account for 35.3% of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level ($F_{13;1205} = 50.490$).

It is also evident from Table 27 that the CAQ subscale scores together account for 1.5% ($F_{5;1210} = 5.610$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size. Moreover, only one of the individual CAQ subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the total sample. Thought Suppression accounts for 0.6% ($F_{1;1214} = 11.104$) of the variance in the PSWQ total score. Given the small effect size reported in Table 27, this result, while statistically significant (at the 1% level), appears to be of limited practical importance.

Table 27 also indicates that the WW-II subscale scores together account for 6.6% ($F_{5;1210} = 24.616$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level and indicates a medium effect size. In addition, four of the WW-II subscale scores appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the total sample. Worry Aids in Problem Solving accounts for 2.5% ($F_{1;1214} = 44.113$), Worry helps Motivate accounts for 4.6% ($F_{1;1214} = 83.724$), Worry Protects from Difficult Emotions accounts for 0.9% ($F_{1;1214} = 15.520$) and Worry is a Positive Personality Traits accounts for 3.1% ($F_{1;1214} = 55.182$) of the variance. These results are significant at the 1% level but indicate small effect sizes.

It is also evident from Table 27 that the NPOQ total score accounts for 3.3% ($F_{1;1210} = 61.716$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size.

Table 27 also indicates that the Positive Beliefs about Worry subscale score on the MCQ-30 accounts for 0.1% ($F_{1;1210} = 1.870$) of the variance in the PSWQ total score of the total sample. However, this result is not significant at the 1% level.

It is also evident from Table 27 that the IUS total score accounts for 2.3% ($F_{1;1210} = 43.014$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size.

Moderated multiple regression analyses in section 6.3.3 revealed that only gender and worry/GAD status moderate the relationship between the predictor variables relevant to the IUM and worry intensity. Consequently, in addition to conducting hierarchical multiple regression analyses for the total sample, it was also necessary to conduct these analyses for gender and worry/GAD status. The results of the hierarchical multiple regression analyses of the IUM for the female participants are reported in Table 28.

Table 28

Results of the Hierarchical Multiple Regression Analysis of the IUM for the Female Participants (n = 709) with the PSWQ Total Score as the Criterion Variable

Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.359	1-7 = 0.016	3.470*	0.03
2. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+sub	0.351	2-7 = 0.008	8.616*	0.01
3. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+trans	0.344	3-7 = 0.001	1.065	-
4. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+distrac	0.343	4-7 = 0	0	-
5. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+avoid	0.343	5-7 = 0	0	-
6. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+supp	0.345	6-7 = 0.002	2.134	-
7. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]	0.343			
8. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+[WW-II]	0.359	8-14 = 0.067	14.529*	0.11
9. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+aids	0.317	9-14 = 0.025	25.586*	0.04
10. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+motivate	0.342	10-14 = 0.05	53.116*	0.08
11. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+protects	0.306	11-14 = 0.014	14.101*	0.02
12. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+prevents	0.291	12-14 = 0	0	-
13. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+positive	0.315	13-14 = 0.023	23.470*	0.03
14. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]	0.292			
15. [IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]+[NPO]	0.359	15-16 = 0.031	33.612*	0.05
16. [IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]	0.328			
17. [IUS]+[NPO]+[WW-II]+[CAQ]+[MCQ-30: Pos]	0.359	17-18 = 0	0	-
18. [IUS]+[NPO]+[WW-II]+[CAQ]	0.359			
19. [MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]+[IUS]	0.359	19-20 = 0.028	30.359*	0.04
20. [MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.331			

Note: IUS = Intolerance of Uncertainty Scale; MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; NPO = Negative Problem Orientation Questionnaire; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

According to Table 28, all the scales measuring cognitive variables hypothesized to comprise the IUM together account for 35.9% of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level ($F_{13,691} = 29.720$).

It is also apparent from Table 28 that the CAQ subscale scores together account for 1.6% ($F_{5,695} = 3.470$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size. Moreover, only one of the individual CAQ subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the female participants. Thought Substitution accounts for 0.8% ($F_{1,699} = 8.616$) of the variance in the PSWQ total score. Given the small effect size reported in Table 28, this result, while statistically significant (at the 1% level), appears to be of limited practical importance.

Table 28 also indicates that the WW-II subscale scores together account for 6.7% ($F_{5,695} = 14.529$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level and indicates a medium effect size. In addition, four of the WW-II subscale scores appear to account individually for significant percentages (at the 1% level) of the variance in the PSWQ total score of the female participants. Worry Aids in Problem Solving accounts for 2.5% ($F_{1,699} = 25.586$), Worry helps Motivate accounts for 5% ($F_{1,699} = 53.116$), Worry Protects from Difficult Emotions accounts for 1.4% ($F_{1,699} = 14.101$) and Worry is a Positive Personality Trait accounts for 2.3% ($F_{1,699} = 23.470$) of the variance. However, only the Worry helps Motivate subscale score yields a medium effect size. Consequently, while four of the WW-II subscale scores account for a significant percentage (at the 1% level) of the variance in the PSWQ total score, only the variance accounted for by the Worry helps Motivate subscale score appears to be of practical importance.

It is apparent from Table 28 that the NPOQ total score accounts for 3.1% ($F_{1,695} = 33.612$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size.

Table 28 indicates that the Positive Beliefs about Worry subscale score on the MCQ-30 accounts for 0% of the variance in the PSWQ total score of the female participants.

Table 28 also indicates that the IUS total score accounts for 2.8% ($F_{1,695} = 30.359$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size.

The results of the hierarchical multiple regression analyses of the IUM for the male participants are reported in Table 29.

Table 29

Results of the Hierarchical Multiple Regression Analysis of the IUM for the Male Participants (n = 515) with the PSWQ Total Score as the Criterion Variable

Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.389	1-7 = 0.016	2.624	-
2. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+sub	0.373	2-7 = 0	0	-
3. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+trans	0.373	3-7 = 0	0	-
4. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+distrac	0.373	4-7 = 0	0	-
5. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+avoid	0.378	5-7 = 0.005	4.06	-
6. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+supp	0.378	6-7 = 0.005	4.06	-
7. [IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]	0.373			
8. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+[WW-II]	0.389	8-14 = 0.064	10.496*	0.1
9. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+aids	0.356	9-14 = 0.031	24.310*	0.05
10. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+motivate	0.361	10-14 = 0.036	28.451*	0.06
11. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+protects	0.335	11-14 = 0.01	7.594*	0.02
12. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+prevents	0.336	12-14 = 0.011	8.366*	0.02
13. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+positive	0.383	13-14 = 0.058	47.472*	0.09
14. [IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]	0.325			
15. [IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]+[NPO]	0.389	15-16 = 0.029	23.780*	0.05
16. [IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]	0.36			
17. [IUS]+[NPO]+[WW-II]+[CAQ]+[MCQ-30: Pos]	0.389	17-18 = 0	0	-
18. [IUS]+[NPO]+[WW-II]+[CAQ]	0.389			
19. [MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]+[IUS]	0.389	19-20 = 0.008	6.56	-
20. [MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.381			

Note: IUS = Intolerance of Uncertainty Scale; MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; NPO = Negative Problem Orientation Questionnaire; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

According to Table 29, all the scales measuring cognitive variables hypothesized to comprise the IUM together account for 38.9% of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level ($F_{13,500} = 24.515$).

It is also apparent from Table 29 that the CAQ subscale scores together account for 1.6% ($F_{5;501} = 2.624$) of the variance in the PSWQ total score of the male participants. However, this result is not significant at the 1% level. Moreover, none of the individual CAQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the male participants.

Table 29 also indicates that the WW-II subscale scores together account for 6.4% ($F_{5;501} = 10.496$) of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level and indicates a medium effect size. Moreover, the individual WW-II subscale scores independently account for a significant percentage (at the 1% level) of the variance in the male participants' PSWQ total score. More specifically, Worry Aids in Problem Solving accounts for 3.1% ($F_{1;505} = 24.310$), Worry helps Motivate accounts for 3.6% ($F_{1;505} = 28.451$), Worry Protects from Difficult Emotions accounts for 1.0% ($F_{1;505} = 7.594$), Worry Prevents Negative Outcomes accounts for 1.1% ($F_{1;505} = 8.366$) and Worry is a Positive Personality Trait accounts for 5.8% ($F_{1;505} = 47.472$) of the variance in the PSWQ total score. However, only the Worry is a Positive Personality Trait subscale score yields a medium effect size. Consequently, while all five of the WW-II subscale scores account for a significant percentage (at the 1% level) of the variance in the PSWQ total score, only the variance accounted for by the Worry is a Positive Personality Trait subscale scores appears to be of practical importance.

Table 29 indicates that the NPOQ total score accounts for 2.9% ($F_{1;501} = 23.780$) of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level but indicates a small effect size.

Table 29 also indicates that the Positive Beliefs about Worry subscale score on the MCQ-30 as well as the IUS total score accounts for 0% of the variance in the PSWQ total score of the male participants.

The results of the hierarchical multiple regression analyses of the IUM for the high-worry GAD participants are reported in Table 30.

Table 30

Results of the Hierarchical Multiple Regression Analysis of the IUM for the High-Worry GAD Participants (n = 70) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.337	1-7 = 0.065	1.098	-
2.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+sub	0.324	2-7 = 0.052	4.615	-
3.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+trans	0.282	3-7 = 0.01	0.836	-
4.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+distrac	0.287	4-7 = 0.015	1.262	-
5.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+avoid	0.295	5-7 = 0.023	1.957	-
6.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+supp	0.284	6-7 = 0.012	1.006	-
7.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]	0.272			
8.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+[WW-II]	0.337	8-14 = 0.106	1.791	-
9.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+aids	0.231	9-14 = 0	0	-
10.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+motivate	0.253	10-14 = 0.022	1.767	-
11.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+protects	0.237	11-14 = 0.006	0.472	-
12.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+prevents	0.264	12-14 = 0.033	2.69	-
13.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+positive	0.251	13-14 = 0.02	1.602	-
14.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]	0.231			
15.	[IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]+[NPO]	0.337	15-16 = 0.111	9.376*	0.17
16.	[IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]	0.226			
17.	[IUS]+[NPO]+[WW-II]+[CAQ]+[MCQ-30: Pos]	0.337	17-18 = 0.01	0.845	-
18.	[IUS]+[NPO]+[WW-II]+[CAQ]	0.327			
19.	[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]+[IUS]	0.337	19-20 = 0	0	-
20.	[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.337			

Note: IUS = Intolerance of Uncertainty Scale; MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; NPO = Negative Problem Orientation Questionnaire; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is apparent from Table 30 that all the scales measuring cognitive variables hypothesized to comprise the IUM together account for 33.7% of the variance in the PSWQ total score of the high-worry GAD participants. This result is significant at the 1% level ($F_{13;55} = 2.155$).

Table 30 indicates that the CAQ subscale scores together account for 6.5% ($F_{5;56} = 1.098$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual CAQ subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ score of the high-worry GAD participants.

It is also apparent from Table 30 that the WW-II subscale scores together account for 10.6% ($F_{5;56} = 1.791$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual WW-II subscale scores appear to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ scores of the high-worry GAD participants.

Table 30 indicates that the NPOQ total score accounts for 11.1% ($F_{1;56} = 9.376$) of the variance in the PSWQ total score of the high-worry GAD participants. This result is significant at the 1% level and indicates a medium effect size.

It is also apparent from Table 30 that the Positive Beliefs About Worry subscale score on the MCQ-30 accounts for 1% ($F_{1;56} = 0.845$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level.

Table 30 also indicates that the IUS total score accounts for 0% of the variance in the PSWQ total score of the high-worry GAD participants.

The results of the hierarchical multiple regression analyses of the IUM for the high-worry non-GAD are reported in Table 31.

Table 31

Results of the Hierarchical Multiple Regression Analysis of the IUM for the High-Worry Non-GAD Participants (n = 49) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.284	1-7 = 0.056	0.547	-
2.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+sub	0.239	2-7 = 0.011	0.564	-
3.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+trans	0.243	3-7 = 0.015	0.773	-
4.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+distrac	0.231	4-7 = 0.003	0.152	-
5.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+avoid	0.24	5-7 = 0.012	0.616	-
6.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+supp	0.241	6-7 = 0.013	0.668	-
7.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]	0.228			
8.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+[WW-II]	0.284	8-14 = 0.140	1.369	-
9.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+aids	0.147	9-14 = 0.003	0.137	-
10.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+motivate	0.145	10-14 = 0.001	0.046	-
11.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+protects	0.145	11-14 = 0.001	0.046	-
12.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+prevents	0.144	12-14 = 0	0	-
13.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+positive	0.209	13-14 = 0.065	3.205	-
14.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]	0.144			
15.	[IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]+[NPO]	0.284	15-16 = 0.09	4.399	-
16.	[IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]	0.194			
17.	[IUS]+[NPO]+[WW-II]+[CAQ]+[MCQ-30: Pos]	0.284	17-18 = 0.024	1.173	-
18.	[IUS]+[NPO]+[WW-II]+[CAQ]	0.26			
19.	[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]+[IUS]	0.284	19-20 = 0.022	1.075	-
20.	[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.262			

Note: IUS = Intolerance of Uncertainty Scale; MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; NPO = Negative Problem Orientation Questionnaire; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

It is evident from Table 31 that all the scales measuring cognitive variables hypothesized to comprise the IUM together account for 28.4% of the variance in the PSWQ total score of the high-worry non-GAD participants. This result is significant at the 1% level ($F_{13,35} 1.070$).

Table 31 also indicates that the CAQ subscale scores together account for 5.6% ($F_{5,35} = 0.547$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual CAQ subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ score of the high-worry non-GAD participants.

It is evident from Table 31 that the WW-II subscale scores together account for 14.0% ($F_{5;35} = 1.369$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual WW-II subscale scores appear to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry non-GAD participants.

It is also apparent from Table 31 that the NPOQ total score accounts for 9.0% ($F_{1;35} = 4.399$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level.

Table 31 also indicates that the Positive Beliefs about Worry subscale score on the MCQ-30 accounts for 2.4% ($F_{1;35} = 1.173$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level.

It is also evident from Table 31 that the IUS total score accounts for 2.2% ($F_{1;35} = 1.075$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level.

The results of the hierarchical multiple regression analyses of the IUM for the low-worry participants are reported in Table 32.

Table 32

Results of the Hierarchical Multiple Regression Analysis of the IUM for the Low-Worry Participants (n = 1105) with the PSWQ TotalScore as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.300	1-7 = 0.009	2.805	-
2.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+sub	0.293	2-7 = 0.002	3.098	-
3.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+trans	0.291	3-7 = 0	0	-
4.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+distrac	0.292	4-7 = 0.001	1.547	-
5.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+avoid	0.293	5-7 = 0.002	3.098	-
6.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]+supp	0.295	6-7 = 0.004	6.213	-
7.	[IUS]+[MCQ-30: Pos]+[NPO]+[WW-II]	0.291			
8.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+[WW-II]	0.300	8-14 = 0.061	19.015*	0.09
9.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+aids	0.267	9-14 = 0.028	41.828*	0.04
10.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+motivate	0.281	10-14 = 0.042	63.964*	0.06
11.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+protects	0.245	11-14 = 0.006	8.702*	0.01
12.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+prevents	0.24	12-14 = 0.001	1.441	-
13.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]+positive	0.269	13-14 = 0.03	44.938*	0.04
14.	[IUS]+[MCQ-30: Pos]+[NPO]+[CAQ]	0.239			
15.	[IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]+[NPO]	0.300	15-16 = 0.023	35.847*	0.03
16.	[IUS]+[MCQ-30: Pos]+[WW-II]+[CAQ]	0.277			
17.	[IUS]+[NPO]+[WW-II]+[CAQ]+[MCQ-30: Pos]	0.300	17-18 = 0	0	-
18.	[IUS]+[NPO]+[WW-II]+[CAQ]	0.300			
19.	[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]+[IUS]	0.300	19-20 = 0.014	21.82*	0.02
20.	[MCQ-30: Pos]+[NPO]+[WW-II]+[CAQ]	0.286			

Note: IUS = Intolerance of Uncertainty Scale; MCQ-30: Pos = Meta Cognitions Questionnaire-30: Positive belief subscale; NPO = Negative Problem Orientation Questionnaire; WW-II = Why Worry II Scale; CAQ = Cognitive Avoidance Questionnaire; sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait

* $p \leq 0.01$

According to Table 32, all the scales measuring cognitive variables hypothesized to comprise the IUM together account for 30.0% of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level ($F_{13,1087} = 35.821$).

It is apparent from Table 32 that the CAQ subscale scores together account for 0.9% ($F_{5,1091} = 2.805$) of the variance in the PSWQ total score of the low-worry participants. However, this result is not significant at the 1% level. Moreover, none of the individual CAQ subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ score of the low-worry participants.

Table 32 indicates that the WW-II subscale scores together account for 6.1% ($F_{5;1091} = 19.015$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level and indicates a medium effect size. Moreover, four of the individual WW-II subscale scores appear to account independently for a significant percentage (at the 1% level) of the variance in the low-worry participants' PSWQ total score. More specifically, Worry Aids in Problem Solving accounts for 2.8% ($F_{1;1095} = 41.828$), Worry helps Motivate accounts for 4.2% ($F_{1;1095} = 63.964$), Worry Protects from Difficult Emotions accounts for 0.6% ($F_{1;1095} = 8.702$) and Worry is a Positive Personality Trait accounts for 3.0% ($F_{1;1095} = 44.938$) of the variance in the PSWQ total score. Given the small effect sizes reported in Table 32, these results, while statistically significant (at the 1% level), appear to be of limited practical importance.

It is apparent from Table 32 that the NPOQ total score accounts for 2.3% ($F_{1;1091} = 35.847$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level but indicates a small effect size.

Table 32 indicates that the Positive Beliefs about Worry subscale score on the MCQ-30 accounts for 0% of the variance in the PSWQ total score of the low-worry participants.

It is also evident from Table 32 that the IUS total score accounts for 1.4% ($F_{1;1091} = 21.82$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level but indicates a small effect size.

It was mentioned previously that results considered to be of practical importance (i.e. indicating a medium to large effect size) would be highlighted. In this regard, the results of the hierarchical regression analyses for the IUM indicate that the WW-II total score accounts for a significant amount of the variance in the PSWQ total scores of the total sample, the female participants, the male participants and the low-worry participants. All these results indicate medium effect sizes and can thus be considered to be of practical importance. In addition, the WW-II Worry helps Motivate subscale score accounts for a significant percentage of the variance in the PSWQ total score of the female participants. This result indicates a medium effect size and is thus considered to be of practical importance. The WW-II Worry is a Positive Personality Trait subscale score accounts for a significant amount of

the variance of the PSWQ total score of the male participants. This result can be considered to be of practical importance, as it indicates a medium effect size. Lastly, the NPOQ total score accounts for a significant amount of the variance in the PSWQ total score for the high-worry GAD participants. This result is also of practical importance, as it indicates a medium effect size.

6.5.4 Combined model

Hierarchical multiple regression analyses were conducted with respect to a combination of the AMW, the MCM and the IUM to determine whether the TCQ subscale scores, the MWQ subscale scores, the MCQ-30 subscale scores, the WW-II subscale scores, the CAQ subscale scores, the NPOQ total score and the IUS total score (predictor variables) account for a significant percentage of the variance in the PSWQ score (criterion variable). These analyses were performed for the total sample, as well as for gender and worry/GAD status (low worry, high-worry non-GAD and high-worry GAD) independently. The results of the regression analysis for the total sample are reported in Table 33.

Table 33

Results of the Hierarchical Multiple Regression Analysis of the Combined Model for the Total Sample (N = 1224) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.41	1-7 = 0.003	1.22	-
2.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Distr	0.407	2-7 = 0	0	-
3.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Sc	0.408	3-7 = 0.001	2.032	-
4.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Worry	0.407	4-7 = 0	0	-
5.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Punish	0.408	5-7 = 0.001	2.032	-
6.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Re-appr	0.408	6-7 = 0.001	2.032	-
7.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]	0.407			
8.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.41	8-11 = 0.008	8.129*	0.01
9.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Freq	0.406	9-11 = 0.004	8.081*	0.01
10.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Bel	0.41	10-11 = 0.008	16.271*	0.01
11.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]	0.402			
12.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.41	12-18 = 0.034	13.819*	0.06
13.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+positive bel	0.376	13-18 = 0	0	-
14.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+negative bel	0.398	14-18 = 0.022	43.963*	0.04
15.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cog conf	0.376	15-18 = 0	0	-
16.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+need cont th	0.38	16-18 = 0.004	7.761*	0.01
17.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cogn self-con	0.376	17-18 = 0	0	-
18.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]	0.376			
19.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.41	19-25 = 0.062	25.199*	0.11
20.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+aids	0.372	20-25 = 0.024	45.975*	0.04
21.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+motivate	0.392	21-25 = 0.044	87.060*	0.07
22.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+protects	0.358	22-25 = 0.01	18.738*	0.02
23.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+prevents	0.349	23-25 = 0.001	1.848	-
24.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+positive	0.381	24-25 = 0.033	64.134*	0.05
25.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]	0.348			
26.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[CAQ]	0.41	26-32 = 0.011	4.471*	0.02
27.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+sub	0.402	27-32 = 0.003	6.035	-
28.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+trans	0.399	28-32 = 0	0	-
29.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+distrac	0.399	29-32 = 0	0	-
30.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+avoid	0.401	30-32 = 0.002	4.017	-
31.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+supp	0.403	31-32 = 0.004	8.060*	0.01
32.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.399			
33.	[IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[NPO]	0.41	33-34 = 0.008	16.258*	0.01
34.	[IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.402			
35.	[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[IUS]	0.41	35-36 = 0.006	12.193*	0.01
36.	[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.404			

Note: IUS = Intolerance of Uncertainty Scale; NPO = Negative Problem Orientation Questionnaire; CAQ = Cognitive Avoidance Questionnaire; WW-II = Why Worry II Scale; MCQ-30 = Meta Cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; freq = frequency; bel = belief; positive bel = positive beliefs about worry; negative bel = negative beliefs about thoughts concerning uncontrollability and danger; cog conf = cognitive confidence; need cont th = need to control thoughts; cogn self-

con = cognitive self-consciousness; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression
* $p \leq 0.01$

It is apparent from Table 33 that all the scales measuring cognitive variables hypothesized to comprise the combined model together account for 41.0% of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level ($F_{24;1194} = 34.607$).

Table 33 also indicates that the TCQ subscale scores together account for 0.3% ($F_{5;1199} = 1.220$) of the variance in the PSWQ total score of the total sample. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the total sample's PSWQ total score.

It is evident from Table 33 that the MWQ subscale scores together account for 0.8% ($F_{2;1199} = 8.129$) of the variance in the PSWQ total score of the total sample. This result is statistically significant at the 1% level but indicates a small effect size. In addition, both of the MWQ subscale scores appear to account individually for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the total sample. The MWQ Frequency subscale score accounts for 0.4% ($F_{1;1200} = 8.081$) and the MWQ Belief subscale score accounts for 0.8% ($F_{1;1200} = 16.271$) of the variance in the PSWQ total score. Given the small effect sizes reported in Table 33, these results, while statistically significant, appear to be of limited practical importance.

Table 33 indicates that the MCQ-30 subscales scores together account for 3.4% ($F_{5;1199} = 13.819$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size. Moreover, two of the individual MCQ-30 subscale scores appear to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the total sample. More specifically, Negative Beliefs about Thoughts Concerning Uncontrollability and Danger accounts for 2.2% ($F_{1;1203} = 43.963$) and Need to Control Thoughts accounts for 0.4% ($F_{1;1203} = 7.761$) of the variance in the PSWQ total score. Given the small effect sizes reported in Table 33, these results, while statistically significant (at the 1% level), appear to be of limited practical importance.

It is evident from Table 33 that the WW-II subscale scores together account for 6.2% ($F_{5;1199} = 25.199$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level and indicates a medium effect size. In addition, four of the individual WW-II subscale scores appear to account independently for significant percentages (at the 1% level) of the variance in the PSWQ total score of the total sample. Worry Aids in Problem Solving accounts for 2.4% ($F_{1;1203} = 45.975$), Worry helps Motivate accounts for 4.4% ($F_{1;1203} = 87.060$), Worry Protects from Difficult Emotions accounts for 1.0% ($F_{1;1203} = 18.738$) and Worry is a Positive Personality Trait accounts for 3.3% ($F_{1;1203} = 64.134$) of the variance. These results are significant at the 1% level but indicate small effect sizes.

It is also apparent from Table 33 that the CAQ subscale scores together account for 1.1% ($F_{5;1199} = 4.471$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size. Moreover, one of the individual CAQ subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the total sample. More specifically, Thought Suppression accounts for 0.4% ($F_{1;1203} = 8.060$) of the variance in the PSWQ total score. This result is significant at the 1% level but indicates a small effect size.

Table 33 also indicates that the NPOQ total score accounts for 0.8% ($F_{1;1199} = 16.258$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size.

It is also apparent from Table 33 that the IUS total score accounts for 0.6% ($F_{1;1199} = 12.193$) of the variance in the PSWQ total score of the total sample. This result is significant at the 1% level but indicates a small effect size.

Moderated multiple regression analyses in section 6.3.4 revealed that only gender and worry/GAD status moderate the relationship between a combination of all the predictor variables relevant to the three models of worry under investigation and worry intensity. Consequently, in addition to conducting hierarchical multiple regression analyses for the total sample, it was also necessary to conduct these analyses for gender and worry/GAD status.

The results of the hierarchical multiple regression analyses of the combined model for the female participants are reported in Table 34.

Table 34

Results of the Hierarchical Multiple Regression Analysis of the Combined Model for the Female Participants (n = 709) with the PSWQ total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.413	1-7 = 0.002	0.466	-
2.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Distr	0.411	2-7 = 0	0	-
3.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Sc	0.412	3-7 = 0.001	1.17	-
4.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Worry	0.412	4-7 = 0.001	1.17	-
5.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Punish	0.412	5-7 = 0.001	1.17	-
6.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Re-appr	0.412	6-7 = 0.001	1.17	-
7.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]	0.411			
8.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.413	8-11 = 0.011	6.409*	0.02
9.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Freq	0.409	9-11 = 0.007	8.113*	0.01
10.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Bel	0.412	10-11 = 0.01	11.650*	0.02
11.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]	0.402			
12.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.413	12-18 = 0.027	6.292*	0.05
13.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+positive bel	0.386	13-18 = 0	0	-
14.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+negative bel	0.398	14-18 = 0.012	13.714*	0.02
15.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cog conf	0.389	15-18 = 0.003	3.378	-
16.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+need cont th	0.393	16-18 = 0.007	7.934*	0.01
17.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cogn self	0.387	17-18 = 0.001	1.122	-
18.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]	0.386			
19.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.413	19-25 = 0.063	14.682*	0.11
20.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+aids	0.374	20-25 = 0.024	26.377*	0.04
21.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+motivate	0.398	21-25 = 0.048	54.857*	0.08
22.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+protects	0.362	22-25 = 0.012	12.940*	0.02
23.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+prevents	0.35	23-25 = 0	0	-
24.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+positive	0.376	24-25 = 0.026	28.667*	0.04
25.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]	0.35			
26.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[CAQ]	0.413	26-32 = 0.01	2.33	-
27.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+sub	0.409	27-32 = 0.006	6.985*	0.01
28.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+trans	0.403	28-32 = 0	0	-
29.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+distrac	0.403	29-32 = 0	0	-
30.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+avoid	0.404	30-32 = 0.001	1.154	-
31.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+supp	0.405	31-32 = 0.002	2.313	-
32.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.403			
33.	[IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[NPO]	0.413	33-34 = 0.007	8.157*	0.01
34.	[IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.406			
35.	[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[IUS]	0.413	35-36 = 0.009	10.487*	0.02
36.	[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.404			

Note: IUS = Intolerance of Uncertainty Scale; NPO = Negative Problem Orientation Questionnaire; CAQ = Cognitive Avoidance Questionnaire; WW-II = Why Worry II Scale; MCQ-30 = Meta Cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; freq = frequency; bel = belief; positive bel = positive beliefs about worry; negative bel = negative beliefs about thoughts concerning uncontrollability and danger; cog conf = cognitive confidence; need cont th = need to control thoughts; cogn self = cognitive self-consciousness; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from

difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression
* $p \leq 0.01$

According to Table 34, all the scales measuring cognitive variables hypothesized to comprise the combined model together account for 41.3% of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level ($F_{24;680} = 19.952$).

It is apparent from Table 34 that the TCQ subscale scores together account for 0.2% ($F_{5;684} = 0.466$) of the variance in the PSWQ total score of the female participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the female participants.

It is also evident from Table 34 that the MWQ subscale scores together account for 1.1% ($F_{2;684} = 6.409$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size. Moreover, the individual MWQ subscale scores appear to account independently for a significant percentage (at the 1% level) of the variance in the female participants' PSWQ total score. More specifically, the MWQ Frequency subscale score accounts for 0.7% ($F_{1;685} = 8.113$) and the MWQ Belief subscale score accounts for 1.0% ($F_{1;685} = 11.650$) of the variance in the PSWQ total score. Given the small effect sizes reported in Table 34, these results, while statistically significant (at the 1% level), appear to be of limited practical importance.

Table 34 indicates that the MCQ-30 subscale scores together account for 2.7% ($F_{5;684} = 6.292$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size. Moreover, two of the individual MCQ-30 subscale scores appear to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the female participants. More specifically, Negative Beliefs about Thoughts Concerning Uncontrollability and Danger accounts for 1.2% ($F_{1;688} = 13.714$) and Need to Control Thoughts accounts for 0.7% ($F_{1;688} = 7.934$) of the variance in the PSWQ total score. Given the small effect sizes reported in Table 34, these results, while statistically significant (at the 1% level), appear to be of limited practical importance.

It is apparent from Table 34 that the WW-II subscale scores together account for 6.3% ($F_{5,684} = 14.682$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level and indicates a medium effect size. Moreover, four of the individual WW-II subscale scores appear to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the female participants. More specifically, Worry Aids in Problem Solving accounts for 2.4% ($F_{1,688} = 26.377$), Worry helps Motivate accounts for 4.8% ($F_{1,688} = 54.857$), Worry Protects from Difficult Emotions accounts for 1.2% ($F_{1,688} = 12.940$) and Worry is a Positive Personality Trait accounts for 2.6% ($F_{1,688} = 28.667$) of the variance in the PSWQ total score. However, only the Worry helps Motivate subscale score yields a medium effect size. Consequently, while four of the WW-II subscale scores account for a significant percentage (at the 1% level) of the variance in PSWQ scores, only the variance accounted for by the Worry helps Motivate subscale score appears to be of practical importance.

It is also apparent from Table 34 that the CAQ subscale scores together account for 1.0% ($F_{5,684} = 2.330$) of the variance in the PSWQ total score of the female participants. However, this result is not significant at the 1% level. Moreover, one of the individual CAQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the female participants. More specifically, Thought Substitution accounts for 0.6% ($F_{1,688} = 6.985$) of the variance in the PSWQ total score. This result is significant at the 1% level but indicates a small effect size.

Table 34 also indicates that the NPOQ total score accounts for 0.7% ($F_{1,684} = 8.157$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size.

It is also apparent from Table 34 that the IUS total score accounts for 0.9% ($F_{1,684} = 10.487$) of the variance in the PSWQ total score of the female participants. This result is significant at the 1% level but indicates a small effect size.

The results of the hierarchical multiple regression analyses of the combined model for the male participants are reported in Table 35.

Table 35

Results of the Hierarchical Multiple Regression Analysis of the Combined Model for the Male Participants (n = 515) with the PSWQ Total Score as the Criterion Variable

	Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.44	1-7 = 0.006	1.05	-
2.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Distr	0.434	2-7 = 0	0	-
3.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Sc	0.437	3-7 = 0.003	2.632	-
4.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Worry	0.434	4-7 = 0	0	-
5.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Punish	0.436	5-7 = 0.002	1.751	-
6.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Re-appr	0.434	6-7 = 0	0	-
7.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]	0.434			
8.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.44	8-11 = 0.008	3.5	-
9.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Freq	0.434	9-11 = 0.002	1.735	-
10.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Bel	0.44	10-11 = 0.008	7.014*	0.01
11.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]	0.432			
12.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.44	12-18 = 0.029	5.075*	0.05
13.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+positive bel	0.411	13-18 = 0	0	0
14.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+negative bel	0.436	14-18 = 0.025	21.897*	0.04
15.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cog conf	0.412	15-18 = 0.001	0.84	-
16.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+need cont th	0.411	16-18 = 0	0	-
17.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cogn self	0.411	17-18 = 0	0	-
18.	[IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]	0.411			
19.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.44	19-25 = 0.068	11.9*	0.12
20.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+aids	0.404	20-25 = 0.032	26.523*	0.05
21.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+motivate	0.411	21-25 = 0.039	32.71*	0.07
22.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+protects	0.384	22-25 = 0.012	9.623*	0.02
23.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+prevents	0.386	23-25 = 0.014	11.264*	0.02
24.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+positive	0.433	24-25 = 0.061	53.146*	0.11
25.	[IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]	0.372			
26.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[CAQ]	0.44	26-32 = 0.016	2.8	-
27.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+sub	0.425	27-32 = 0.001	0.859	-
28.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+trans	0.424	28-32 = 0	0	-
29.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+distrac	0.425	29-32 = 0.001	0.859	-
30.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+avoid	0.429	30-32 = 0.005	4.326	-
31.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+supp	0.428	31-32 = 0.004	3.455	-
32.	[IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.424			
33.	[IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[NPO]	0.44	33-34 = 0.006	5.25	-
34.	[IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.434			
35.	[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[IUS]	0.44	35-36 = 0.001	0.875	-
36.	[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.439			

Note: IUS = Intolerance of Uncertainty Scale; NPO = Negative Problem Orientation Questionnaire; CAQ = Cognitive Avoidance Questionnaire; WW-II = Why Worry II Scale; MCQ-30 = Meta Cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; freq = frequency; bel = belief; positive bel = positive beliefs about worry; negative bel = negative beliefs about thoughts concerning uncontrollability and danger; cog conf = cognitive confidence; need cont th = need to control thoughts; cogn self = cognitive self-consciousness; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from

difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression
* $p \leq 0.01$

It is evident from Table 35 that all the scales measuring cognitive variables hypothesized to comprise the combined model together account for 44.0% ($F_{24,489} = 16.009$) of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level.

It is also apparent from Table 35 that the TCQ subscale scores together account for 0.6% ($F_{5,490} = 1.050$) of the variance in the PSWQ total score of the male participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the male participants.

Table 35 also indicates that the MWQ subscale scores together account for 0.8% ($F_{2,490} = 3.5$) of the variance in the PSWQ total score of the male participants. However, this result is not significant at the 1% level. It is also apparent from Table 35 that the individual MWQ subscale scores independently account for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the male participants. More specifically, the MWQ: Frequency subscale score accounts for 0.2% ($F_{1,491} = 1.735$) and the MWQ: Belief subscale score accounts for 0.8% ($F_{1,491} = 7.014$) of the variance in the PSWQ total score. However, only the result of the MWQ Belief subscale score is significant at the 1% level but indicates a small effect size.

Table 35 indicates that the MCQ-30 subscale scores together account for 2.9% ($F_{5,490} = 5.075$) of the variance in the PSWQ total score of the male participants. This result is significant at the 1% level but indicates a small effect size. In addition, one of the individual MCQ-30 subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the male participants' PSWQ total score. More specifically, Negative Beliefs about Thoughts Concerning Uncontrollability and Danger accounts for 2.5% ($F_{1,494} = 21.897$) of the variance in the PSWQ total score. This result is significant at the 1% level but indicates a small effect size.

It is apparent from Table 35 that the WW-II subscale scores together account for 6.8% ($F_{5,490} = 11.9$) of the variance in the PSWQ total score of the male participants. This result is

significant at the 1% level and indicates a medium effect size. Moreover, all five of the individual WW-II subscale scores appear to account independently for a significant percentage (at the 1% level) of the variance in the male participants' PSWQ total score. More specifically, Worry Aids in Problem Solving accounts for 3.2% ($F_{1,494} = 26.523$), Worry helps Motivate account for 3.9% ($F_{1,494} = 32.71$), Worry Protects from Difficult Emotions accounts for 1.2% ($F_{1,494} = 9.623$), Worry Prevents Negative Outcomes accounts for 1.6% ($F_{1,494} = 11.264$) and Worry is a Positive Personality Trait accounts for 6.1% ($F_{1,494} = 53.146$) of the variance in the PSWQ total score. However, only the Worry is a Positive Personality Trait subscale score yields a medium effect size. Consequently, while four of the WW-II subscale scores account for a significant percentage (at the 1% level) of the variance in PSWQ scores, only the variance accounted for by the Worry is a Positive Personality Trait subscale score appears to be of practical importance.

It is also apparent from Table 35 that the CAQ subscale scores together account for 1.6% ($F_{5,490} = 2.8$) of the variance in the PSWQ total score of the male participants. However, this result is not significant at the 1% level. Moreover, none of the individual CAQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the male participants.

Table 35 indicates that the NPOQ total score accounts for 0.6% ($F_{1,490} = 5.25$) of the variance in the PSWQ total score of the male participants. However, this result is not significant at the 1% level.

It is also apparent from Table 35 that the IUS total score accounts for 0.1% ($F_{1,490} = 0.875$) of the variance in the PSWQ total score of the male participants. However, this result is not significant at the 1% level.

The results of the hierarchical multiple regression analyses of the combined model for the high-worry GAD participants are reported in Table 36.

Table 36

Results of the Hierarchical Multiple Regression Analysis of the Combined Model for the High-Worry GAD Participants (n = 70) with the PSWQ Total Score as the Criterion Variable

Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.465	1-7 = 0.031	0.521	-
2. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Distr	0.447	2-7 = 0.013	1.152	-
3. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Sc	0.44	3-7 = 0.006	0.525	-
4. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Worry	0.435	4-7 = 0.001	0.087	-
5. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Punish	0.441	5-7 = 0.007	0.614	-
6. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Re-appr	0.435	6-7 = 0.001	0.087	-
7. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]	0.434			
8. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.465	8-11 = 0.018	0.757	-
9. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Freq	0.461	9-11 = 0.014	1.195	-
10. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Bel	0.461	10-11 = 0.014	1.195	-
11. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]	0.447			
12. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.465	12-18 = 0.067	1.127	-
13. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+positive bel	0.402	13-18 = 0.004	0.328	-
14. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+negative bel	0.398	14-18 = 0	0	-
15. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cog con	0.451	15-18 = 0.053	4.73	-
16. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+need cont th	0.399	16-18 = 0.001	0.082	-
17. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cogn self	0.398	17-18 = 0	0	-
18. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]	0.398			
19. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.465	19-25 = 0.129	2.17	-
20. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+aids	0.339	20-25 = 0.003	0.222	-
21. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+motivate	0.406	21-25 = 0.07	5.774	-
22. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+protects	0.348	22-25 = 0.012	0.902	-
23. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+prevents	0.354	23-25 = 0.018	1.365	-
24. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+positive	0.342	24-25 = 0.006	0.447	-
25. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]	0.336			
26. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[CAQ]	0.465	26-32 = 0.037	0.622	-
27. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+sub	0.443	27-32 = 0.015	1.32	-
28. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+trans	0.429	28-32 = 0.001	0.086	-
29. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+distrac	0.44	29-32 = 0.012	1.05	-
30. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+avoid	0.436	30-32 = 0.008	0.695	-
31. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+supp	0.432	31-32 = 0.004	0.345	-
32. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.428			
33. [IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[NPO]	0.465	33-34 = 0.012	1.009	-
34. [IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.453			
35. [NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[IUS]	0.465	35-36 = 0.001	0.084	-
36. [NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.464			

Note: IUS = Intolerance of Uncertainty Scale; NPO = Negative Problem Orientation Questionnaire; CAQ = Cognitive Avoidance Questionnaire; WW-II = Why Worry II Scale; MCQ-30 = Meta Cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; freq = frequency; bel = belief; positive bel = positive beliefs about worry; negative bel = negative beliefs about thoughts concerning uncontrollability and danger; cog conf = cognitive confidence; need cont th = need to control thoughts; cogn self = cognitive self-consciousness; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from

difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression
 * $p \leq 0.01$

According to Table 36, all the scales measuring cognitive variables hypothesized to comprise the combined model together account for 46.5% of the variance in the PSWQ total score of the high-worry GAD participants. This result is significant at the 1% level ($F_{24;44} = 1.592$).

Table 36 also indicates that the TCQ subscale scores together account for 3.1% ($F_{5;45} = 0.521$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the high-worry GAD participants' PSWQ total score.

It is also apparent from Table 36 that the MWQ subscale scores together account for 1.8% ($F_{2;45} = 0.757$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual MWQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry GAD participants.

Table 36 indicates that the MCQ-30 subscale scores together account for 6.7% ($F_{5;45} = 1.127$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. In addition, none of the individual MCQ-30 subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry GAD participants.

It is evident from Table 36 that the WW-II subscale scores together account for 12.9% ($F_{5;45} = 2.17$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. Table 36 also indicates that none of the individual WW-II subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry GAD participants.

Table 36 also indicates that the CAQ subscale scores together account for 3.7% ($F_{5;45} = 0.622$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual CAQ

subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry GAD participants.

It is apparent from Table 36 that the NPOQ total score accounts for 1.2% ($F_{1,45} = 1.009$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level.

Table 36 also indicates that the IUS total score accounts for 0.1% ($F_{1,45} = 0.084$) of the variance in the PSWQ total score of the high-worry GAD participants. However, this result is not significant at the 1% level.

The results of the hierarchical multiple regression analyses of the combined model for the high-worry non-GAD participants are reported in Table 37.

Table 37

Results of the Hierarchical Multiple Regression Analysis of the Combined Model for the High-Worry Non-GAD Participants (n = 49) with the PSWQ Total Score as the Criterion Variable

Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.422	1-7 = 0.027	0.224	-
2. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Distr	0.395	2-7 = 0	0	-
3. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Sc	0.396	3-7 = 0.001	0.046	-
4. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Worry	0.396	4-7 = 0.001	0.046	-
5. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Punish	0.396	5-7 = 0.001	0.046	-
6. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Re-appr	0.414	6-7 = 0.019	0.908	-
7. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]	0.395			
8. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.422	8-11 = 0.002	0.042	-
9. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Freq	0.422	9-11 = 0.002	0.087	-
10. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Bel	0.421	10-11 = 0.001	0.043	-
11. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]	0.42			
12. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.422	12-18 = 0.109	0.905	-
13. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+positive bel	0.352	13-18 = 0.039	1.685	-
14. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+negative bel	0.315	14-18 = 0.002	0.082	-
15. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cog conf	0.329	15-18 = 0.016	0.668	-
16. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+need cont th	0.346	16-18 = 0.033	1.413	-
17. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cogn self	0.332	17-18 = 0.019	0.796	-
18. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]	0.313			
19. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.422	19-25 = 0.081	0.673	-
20. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+aids	0.348	20-25 = 0.007	0.301	-
21. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+motivate	0.358	21-25 = 0.017	0.741	-
22. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+protects	0.35	22-25 = 0.009	0.388	-
23. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+prevents	0.368	23-25 = 0.027	1.196	-
24. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+positive	0.343	24-25 = 0.002	0.085	-
25. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]	0.341			
26. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[CAQ]	0.422	26-32 = 0.029	0.241	-
27. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+sub	0.394	27-32 = 0.001	0.046	-
28. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+trans	0.41	28-32 = 0.017	0.807	-
29. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+distrac	0.398	29-32 = 0.005	0.233	-
30. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+avoid	0.399	30-32 = 0.006	0.28	-
31. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+supp	0.409	31-32 = 0.016	0.758	-
32. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.393			
33. [IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[NPO]	0.422	33-34 = 0.034	1.412	-
34. [IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.388			
35. [NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[IUS]	0.422	35-36 = 0.021	0.872	-
36. [NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.401			

Note: IUS = Intolerance of Uncertainty Scale; NPO = Negative Problem Orientation Questionnaire; CAQ = Cognitive Avoidance Questionnaire; WW-II = Why Worry II Scale; MCQ-30 = Meta Cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; freq = frequency; bel = belief; positive bel = positive beliefs about worry; negative bel = negative beliefs about thoughts concerning uncontrollability and danger; cog conf = cognitive confidence; need cont th = need to control thoughts; cogn self = cognitive self-consciousness; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from

difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression
* $p \leq 0.01$

It is evident from Table 37 that all the scales measuring cognitive variables hypothesized to comprise the combined model together account for 42.2% of the variance in the PSWQ total score of the high-worry non-GAD participants. This result is significant at the 1% level ($F_{24;24} = 0.731$).

It is also apparent from Table 37 that the TCQ subscale scores together account for 2.7% ($F_{5;24} = 0.224$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry non-GAD participants.

Table 37 indicates that the MWQ subscale scores together account for 0.2% ($F_{2;24} = 0.042$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. Moreover, none of the individual MWQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry non-GAD participants.

Table 37 indicates that the MCQ-30 subscale scores account for 10.9% ($F_{5;24} = 0.905$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. In addition, none of the individual MCQ-30 subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry non-GAD participants.

It is also evident from Table 37 that the WW-II subscale scores together account for 8.1% ($F_{5;24} = 0.673$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. Table 37 also indicates that none of the individual WW-II subscale scores independently accounts for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry non-GAD participants.

Table 37 also indicates that the CAQ subscale scores together account for 2.9% ($F_{5;24} = 0.241$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level. In addition, none of the individual CAQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the high-worry non-GAD participants.

It is apparent from Table 37 that the NPOQ total score accounts for 3.4% ($F_{1;24} = 1.412$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level.

Table 37 also indicates that the IUS total score accounts for 2.1% ($F_{1;24} = 0.872$) of the variance in the PSWQ total score of the high-worry non-GAD participants. However, this result is not significant at the 1% level.

The results of the hierarchical multiple regression analyses of the combined model for the low-worry participants are reported in Table 38.

Table 38

Results of the Hierarchical Multiple Regression Analysis of the Combined Model for the Low-Worry Participants (n = 1105) with the PSWQ Total Score as the Criterion Variable

Predictor variables	R ²	Contributes to R ² : (Complete – decreased)	F	f ²
1. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.342	1-7 = 0.002	0.657	-
2. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Distr	0.340	2-7 = 0	0	-
3. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Sc	0.341	3-7 = 0.001	1.645	-
4. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Worry	0.340	4-7 = 0	0	-
5. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Punish	0.340	5-7 = 0	0	-
6. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+Re-appr	0.340	6-7 = 0	0	-
7. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]	0.340			
8. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+[MWQ]	0.342	8-11 = 0.013	10.669*	0.02
9. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Freq	0.335	9-11 = 0.006	9.753*	0.01
10. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]+Bel	0.341	10-11 = 0.012	19.684*	0.02
11. [IUS]+[NPO]+[CAQ]+[WW-II]+[MCQ-30]+[TCQ]	0.329			
12. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+[MCQ-30]	0.342	12-18 = 0.018	5.909*	0.03
13. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+positive bel	0.324	13-18 = 0	0	-
14. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+negative bel	0.335	14-18 = 0.011	17.931*	0.02
15. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cog con	0.324	15-18 = 0	0	-
16. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+need cont th	0.325	16-18 = 0.001	1.606	-
17. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]+cogn self	0.324	17-18 = 0	0	-
18. [IUS]+[NPO]+[CAQ]+[WW-II]+[MWQ]+[TCQ]	0.324			
19. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+[WW-II]	0.342	19-25 = 0.062	20.353*	0.09
20. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+aids	0.306	20-25 = 0.026	40.611*	0.04
21. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+motivate	0.323	21-25 = 0.043	68.851*	0.06
22. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+protects	0.287	22-25 = 0.007	10.642*	0.01
23. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+prevents	0.281	23-25 = 0.001	1.508	-
24. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]+positive	0.312	24-25 = 0.032	50.419*	0.05
25. [IUS]+[NPO]+[CAQ]+[MCQ-30]+[MWQ]+[TCQ]	0.280			
26. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[CAQ]	0.342	26-32 = 0.009	2.954	-
27. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+sub	0.335	27-32 = 0.002	3.26	-
28. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+trans	0.333	28-32 = 0	0	-
29. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+distrac	0.333	29-32 = 0	0	-
30. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+avoid	0.334	30-32 = 0.001	1.628	-
31. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+supp	0.336	31-32 = 0.003	4.898	-
32. [IUS]+[NPO]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.333			
33. [IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[NPO]	0.342	33-34 = 0.005	8.207*	0.01
34. [IUS]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.337			
35. [NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]+[IUS]	0.342	35-36 = 0.004	6.565	-
36. [NPO]+[CAQ]+[WW-II]+[MCQ-30]+[MWQ]+[TCQ]	0.338			

Note: IUS = Intolerance of Uncertainty Scale; NPO = Negative Problem Orientation Questionnaire; CAQ = Cognitive Avoidance Questionnaire; WW-II = Why Worry II Scale; MCQ-30 = Meta Cognitions Questionnaire-30; MWQ = Meta Worry Questionnaire; TCQ = Thought Control Questionnaire; freq = frequency; bel = belief; positive bel = positive beliefs about worry; negative bel = negative beliefs about thoughts concerning uncontrollability and danger; cog conf = cognitive confidence; need cont th = need to control thoughts; cogn self = cognitive self-consciousness; aids = worry aids in problem solving; motivate = worry helps motivate; protects = worry protects from

difficult emotions; prevents = worry prevents negative outcomes; positive = worry is a positive personality trait sub = thought substitution; trans = transformation of images into thoughts; distrac = distraction; avoid = avoidance of threatening stimuli; supp = thought suppression
* $p \leq 0.01$

According to Table 38, all the scales measuring cognitive variables hypothesized to comprise the combined model together account for 34.2% of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level ($F_{24,1076} = 23.200$).

It is evident from Table 38 that the TCQ subscale scores together account for 0.2% ($F_{5,1080} = 0.657$) of the variance in the PSWQ total score of the low-worry participants. However, this result is not significant at the 1% level. Moreover, none of the individual TCQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the low-worry participants.

It is also apparent from Table 38 that the MWQ subscale scores together account for 1.3% ($F_{2,1080} = 10.669$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level but indicates a small effect size. Moreover, the individual MWQ subscale scores independently account for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the low-worry participants. More specifically, the MWQ Frequency subscale score accounts for 1.3% ($F_{1,1084} = 9.753$) and the MWQ Belief subscale score accounts for 1.2% ($F_{1,1084} = 19.684$) of the variance in the PSWQ total score. Given the small effect sizes reported in Table 38, these results, while statistically significant (at the 1% level), appear to be of limited practical importance.

Table 38 indicates that the MCQ-30 subscale scores account for 1.8% ($F_{5,1080} = 5.909$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level but indicates a small effect size. Moreover, one of the individual MCQ-30 subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the low-worry participants' PSWQ total score. More specifically, Negative Beliefs about Thoughts Concerning Uncontrollability and Danger accounts for 1.1% ($F_{1,1084} = 17.931$) of the variance in the PSWQ total score. This result is significant at the 1% level but indicates a small effect size.

It is apparent from Table 38 that the WW-II subscale scores together account for 6.2% ($F_{5,1080} = 20.353$) of the variance in the PSWQ total score of the low-worry participants. This

result is significant at the 1% level and indicates a medium effect size. Moreover, four of the individual WW-II subscale scores appear to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the low-worry participants. More specifically, Worry Aids in Problem Solving accounts for 2.6% ($F_{1,1084} = 40.611$), Worry helps Motivate accounts for 4.3% ($F_{1,1084} = 68.851$), Worry Protects from Difficult Emotions accounts for 0.7% ($F_{1,1084} = 10.642$) and Worry is a Positive Personality Trait accounts for 3.2% ($F_{1,1084} = 50.419$) of the variance in the PSWQ total score. These results are significant at the 1% level but indicate small effect sizes.

It is apparent from Table 38 that the CAQ subscale scores together account for 0.9% ($F_{5,1080} = 2.954$) of the variance in the PSWQ total score of the low-worry participants. However, this result is not significant at the 1% level. Moreover, none of the individual CAQ subscale scores appears to account independently for a significant percentage (at the 1% level) of the variance in the PSWQ total score of the low-worry participants.

It is apparent from Table 38 that the NPOQ total score accounts for 0.5% ($F_{1,1080} = 8.207$) of the variance in the PSWQ total score of the low-worry participants. This result is significant at the 1% level but indicates a small effect size.

Table 38 also indicates that the IUS total score accounts for 0.4% ($F_{1,1080} = 6.565$) of the variance in the PSWQ total score of the low-worry participants. However, this result is not significant at the 1% level.

It was stated previously that results considered to be of practical importance (i.e. indicating a medium to large effect size) would be highlighted. In this regard, the results of the hierarchical regression analyses for the combination of the three models of worry (AMW, MCM and IUM) indicate that the WW-II total score accounts for a significant amount of the variance in the PSWQ total scores of the total sample, the female participants, the male participants and the low-worry participants. All these results indicate medium effect sizes and can thus be considered to be of practical importance. In addition, the WW-II Worry helps Motivate subscale score accounts for a significant percentage of the variance in the PSWQ total score of the female participants. This result indicates a medium effect size and thus is considered to be of practical importance. Lastly, the WW-II Worry is a Positive Personality

Trait subscale score accounts for a significant amount of the variance of the PSWQ total score of the male participants. This result can be considered to be of practical importance, as it indicates a medium effect size.

6.6 DIFFERENCES IN PROPORTIONAL VARIANCE

Finally, analyses were conducted to determine whether a combined model of excessive worry (combination of the AMW, the MCM and the IUM) accounts for a significantly greater percentage of the variance in worry intensity than is accounted for by each of the three (AMW, MCM and IUM) models independently. Analyses were conducted for the total sample, as well as for gender and worry/GAD status (high-worry GAD, high-worry non-GAD and low worry) independently.

The hierarchical F -test was employed to determine whether significant differences in R^2 values exist with regard to the different models. The results of these analyses, together with the relevant f^2 values, are reported in the tables that follow. Only statistically significant results that are also indicative of medium or large effect sizes will be highlighted (small effect size: $f^2 = 0.01$; medium effect size: $f^2 = 0.15$; large effect size: $f^2 = 0.35$).

6.6.1 Combined model and AMW

Initially, the combined model was compared to the AMW with respect to the total sample, as well as gender and worry/GAD status. The results of these analyses are reflected in Table 39.

Table 39

Hierarchical F-test to Determine Differences in R^2 for the Combined Model and the AMW

Group	R^2 Combined model	R^2 AMW	Difference in R^2	F	f^2
Total sample	0.410	0.264	0.146	22.827*	0.25
Female	0.413	0.259	0.154	13.805*	0.26
Male	0.440	0.336	0.104	7.000*	0.19
High-worry GAD	0.465	0.180	0.285	1.844	-
High-worry non-GAD	0.422	0.159	0.263	0.840	-
Low worry	0.342	0.244	0.098	12.378*	0.15

* $p \leq 0.01$

It is evident from Table 39 that significant differences (at the 1% level) in the proportional variance accounted for by the combined model and the AMW are apparent for the total

sample, as well as for the male participants, the female participants and the low-worry participants. Thus, it is appears that the combined model accounts for a larger percentage of the variance in worry intensity than the AMW does for these groups. Medium or medium to large effect sizes are apparent in all four cases (total sample, male participants, female participants and the low-worry participants). The difference in the percentage of the proportional variance accounted for by the two models is thus of noteworthy practical importance.

6.6.2 Combined model and MCM

Secondly, the combined model was compared to the MCM with respect to the total sample, as well as gender and worry/GAD status. The results of these analyses are reflected in Table 40.

Table 40

Hierarchical F-test to Determine Differences in R^2 for the Combined Model and the MCM

Group	R^2 Combined model	R^2 MCM	Difference in R^2	F	f^2
Total sample	0.410	0.380	0.030	8.711*	0.05
Female	0.413	0.385	0.028	4.661*	0.05
Male	0.440	0.416	0.024	3.000*	0.04
High-worry GAD	0.465	0.422	0.043	0.517	-
High-worry non-GAD	0.422	0.328	0.094	0.558	-
Low worry	0.342	0.321	0.021	4.926*	0.03

* $p \leq 0.01$

It is evident from Table 40 that significant differences (at the 1% level) in the proportional variance accounted for by the combined model and the MCM are apparent for the total sample, as well as for the male participants, the female participants and the low-worry participants. However, small effect sizes are apparent in all four cases (total sample, male participants, female participants and the low-worry participants). The difference in the percentage of the proportional variance accounted for by the two models is thus not considered to be of noteworthy practical importance.

6.6.3 Combined model and IUM

Finally, the combined model was compared to the IUM with respect to the total sample, as well as gender and worry/GAD status. The results of these analyses are reflected in Table 41.

Table 41

Hierarchical F-test to Determine Differences in R^2 for the Combined Model and the IUM

Group	R^2 Combined model	R^2 IUM	Difference in R^2	F	f^2
Total sample	0.410	0.353	0.057	10.532*	0.10
Female	0.413	0.359	0.054	5.721*	0.09
Male	0.440	0.389	0.051	4.057*	0.09
High-worry GAD	0.465	0.337	0.128	0.979	-
High-worry non-GAD	0.422	0.284	0.138	0.521	-
Low worry	0.342	0.300	0.042	6.269*	0.06

* $p \leq 0.01$

It appears evident from Table 41 that significant differences (at the 1% level) in the proportional variance accounted for by the combined model and the IUM are apparent for the total sample, as well as the male participants, the female participants and the low-worry participants. However, small effect sizes are apparent in all four cases (total sample, male participants, female participants and the low-worry participants). Consequently, despite the significant differences in the proportional variance accounted for by the combined model and the IUM, these results are not considered to be of noteworthy practical importance.

In conclusion, a series of hierarchical F -tests was employed to determine whether the combined model accounted for a significantly greater percentage of the proportional variance in the worry intensity of the total sample, as well as across gender and worry/GAD status than is accounted for by each of the three models individually. The combined model appears to account for a significantly greater percentage of the variance in worry intensity than the AMW does for the total sample, male participants, female participants and the low-worry participants. Moreover, medium or medium to large effect sizes are apparent in all four cases (total sample, male participants, female participants and the low-worry participants). The difference in the percentage of the proportional variance accounted for by the two models is thus of noteworthy practical importance. The results of these analyses thus appear to suggest that the combined model succeeds in accounting only for a significantly greater proportion of

the variance in worry intensity than one of the models under investigation (i.e. AMW). It should be noted the combined model failed to account for a significantly greater proportion of the variance in worry intensity than any of the three models with regard to the high-worry GAD ($n = 70$) and the high-worry non-GAD ($n = 49$) groups. However, these results should be interpreted with care due to the comparatively small sizes of these samples.

7 DISCUSSION

7.1 INTRODUCTION

The primary aim of this study was to determine the applicability of three cognitive models of excessive worry (AMW, MCM and IUM) in a multi-ethnic context. More specifically, this study aimed to investigate whether these three models (individually or in combination) are able to account for a significant amount of the variance in the worry intensity of low worriers (normal worry) and high-worry GAD and high-worry non-GAD. Furthermore, the applicability of these models, individually and in combination, across ethnicity and gender was also of interest in the current study.

Prior to pursuing the primary objectives of the study, namely determining the extent to which each model is able to account for the variance in worry intensity in the current sample, it was necessary to determine whether certain biographical variables (ethnicity and gender) moderated the relationship between constructs relevant to each theory (independently and in combination) and worry intensity. It was also necessary to determine whether worry/GAD status moderated the aforementioned relationship in any significant way. Consequently, the first part of this chapter discusses the findings relevant to determining the moderating effect of ethnicity, gender and worry/GAD status on the relationship between constructs relevant to the three models of worry and worry intensity in the current sample. Thereafter, the applicability of each of the three models of worry, as well as a model combining the variables relevant to each of the three models to worry in the multi-ethnic South African context will be discussed. Conclusions will be drawn based on the most salient findings of the current study prior to highlighting certain limitations. Finally, the practical implications of the findings of the current study will be discussed, and potential avenues for future research will be identified. It is important to note that only results that were significant at the 1% level and are indicative of at least a medium effect size – and thus of noteworthy practical importance – will be discussed in detail in this chapter.

7.2 THE MODERATING EFFECT OF BIOGRAPHICAL VARIABLES ON THE RELATIONSHIP BETWEEN COGNITIVE CONSTRUCTS AND WORRY INTENSITY

7.2.1 Ethnicity

One of the primary aims of the current study was to determine the applicability of three models of excessive worry to a multi-ethnic context. To this end, the extent to which ethnicity moderated the relationship between cognitive variables relevant to the three models of worry investigated in this study and worry intensity was investigated. The results of the moderated hierarchical multiple regression analyses revealed that ethnicity (Caucasian/black) did not moderate the relationship between the cognitive constructs comprising the AMW, MCM and IUM (independently or in combination) and worry intensity in the current sample. Although this is the first study to the researcher's knowledge to investigate the relationship of these variables to worry intensity with regard to ethnicity, a small number of studies previously investigated ethnic differences in the experience of worry. Neither Gillis et al. (1995) nor Scott et al. (2002) were able to find statistically significant ethnic differences in either the frequency or intensity of worry reported by the participants in their studies. Similarly, the results of the present study suggest that no statistically significant ethnic differences can be found in the extent to which the cognitive variables relevant to each of the three models of worry are able to account for the worry intensity reported by the current sample.

The findings of the current study appear to be somewhat contrary to recent reviews of the suitability of worry as a core feature of GAD across ethnicities (e.g. Lewis-Fernández, et al., 2010). The prerequisite that worry be excessive, uncontrollable and of specific duration before a diagnosis of GAD can be made has been questioned in the multi-ethnic arena (Diaz, 2000; Lee et al., 2009; Ruscio et al., 2005). Much of the cross-ethnic or cross-cultural work on worry in GAD focus on the manner in which certain ethnicities are purported to experience and express symptoms of anxiety. From this perspective, it is often reasoned that people from Western societies are more likely to experience and report cognitive symptoms of anxiety such as worry, while individuals from non-Western societies may experience

anxiety more somatically (Lewis-Fernández et al., 2010). Consequently, and of more relevance to the current study, one could argue that the relationship between cognitive variables hypothesised to underlie the development and maintenance of worry varies due to the effect of ethnicity. However, this does not appear to be the case in the current study.

The findings of the current study with regard to ethnicity and worry should not be viewed as evidence that no ethnic differences exist with regard to the experience of worry or the relationship between the cognitive variables underlying worry and worry intensity in the South African population as a whole, particularly because this study included only two broadly defined ethnic groups (black and Caucasian). The findings cannot be generalized to other ethnicities comprising the South African population. The current study made use of a sample of university students, and it could be argued that, as students, these individuals, irrespective of their particular ethnic backgrounds, have very similar day-to-day experiences and that the apparent lack of ethnic differences in the mechanisms underlying their worry may rather be a reflection of the homogeneity of the current life experiences of the sample. The possibility of a greater degree of westernisation among black individuals who have had prolonged exposure to Western-based education systems can also not be excluded in this instance. Furthermore, the work that has been done to date with regard to ethnicity and worry focussed primarily on the content and uncontrollability of worry (Diaz et al., 2000; Lee et al., 2009; Ruscio et al., 2005; Scott et al., 2002). Given that these aspects of worry were not specifically investigated in the current study, differences in the content of the worry experienced by participants from different ethnic backgrounds cannot be discounted. The exploration of the content and nature of worry across ethnicities in the South African context appears to be indicated. In addition, much of the research on ethnic differences in worry and worry in general, as well as the debate on the cross-ethnic validity of worry as a primary marker for GAD is limited to the clinical arena. Consequently, the extent to which the findings from most of the existing research can be generalized to normal worry or worry in a non-clinical context is questionable. Similarly, the findings of the current study – specifically with regard to ethnic differences in the relationship between cognitive constructs generally thought to underpin worry and worry intensity – cannot be readily generalized to the clinical context, and replication of these findings in clinical populations is necessary. Nevertheless, the conclusion that can be drawn from the present study is that ethnicity does not seem to

significantly influence the relationship between the cognitive constructs pertinent to the AMW, MCM and IUM and worry intensity in the current sample.

7.2.2 Gender

The current study appears to be one of only a handful to explore whether or not significant gender differences exist with regard to the cognitive variables hypothesised to underlie the development and maintenance of excessive worry (D’Zilla et al., 1998; Robichaud et al., 2003). However, a limited body of research suggests that gender differences are apparent with regard to the prevalence of GAD (Bijl et al., 1998; Carter et al., 2001; Wittchen et al., 1994), a disorder considered to be characterised by excessive and uncontrollable worry, and worry intensity (Lewinsohn et al., 1998; McCann et al., 1991, Olatunji et al., 2007; Robichaud et al., 2003). Literature on gender and worry suggests that women consistently report experiencing significantly higher levels of worry intensity than men do (Lewinsohn et al., 1998; McCann et al., 1991, Olatunji et al., 2007; Robichaud et al., 2003). Apparently, no studies have addressed gender differences in worry intensity and content across ethnicity. Thus, there may be a need for such a study to be conducted, as ethnic differences in the content of worry have been reported (Scott et al., 2002) and gender differences with regard to the content and intensity of worry have also been reported (Lewinsohn et al., 1998; McCann et al., 1991, Olatunji et al., 2007; Robichaud et al., 2003). Furthermore, the results of the current study suggest that, while ethnicity does not influence the relationship between the cognitive variables underlying worry and worry intensity, gender does. The interaction between gender and ethnicity as it relates to the content of worry, the intensity of worry and cognitive mechanisms underlying worry appear to be poorly understood at present.

In the current study, gender was found to moderate the relationship between cognitive variables relevant to the AMW, MCM and IUM and worry intensity. This suggests that, while the same or similar cognitive constructs can be said to underlie the development and maintenance of worry, they may do so in different ways across gender. The current findings appear to be generally in line with limited existing research in this area. According to Robichaud et al. (2003), men are reported to hold more positive beliefs about worry than women do. These authors hypothesise that men may be more inclined to view worry as making a positive contribution to problem solving. However, the current study found that

positive beliefs about worry contributed significantly to worry intensity in both the male and female participants. Moreover, viewing worry as a source of motivation accounted for a significant amount of the variance in worry intensity for both genders. However, viewing worry as a positive personality trait only made a significant and noteworthy contribution to accounting for the variance in worry intensity among the male participants. Thus, it seems that gender does influence the relationship between specific positive beliefs about worry and worry intensity. There appears to be a degree of agreement between the current findings and existing literature in this regard. It should be noted once again, however, that the current sample was comprised of university students and that their positive orientation towards worry as a source of motivation may be influenced to some degree by their current academic environment. Consequently, the current findings regarding gender and positive beliefs about worry cannot be generalized beyond the university context.

D’Zilla et al. (1998) and Robichaud et al. (2003) report that the women in their samples tended to be significantly more negatively oriented towards their problems than the men were. According to Robichaud and colleagues (2003), women are also more inclined to engage in thought suppression than men are. In the current study, cognitive avoidance and negative problem orientation were found to contribute significantly to the worry intensity of males and females. However, none of these findings was of noteworthy practical importance. Thus, it appears that there is little support in the current study for gender differences with regard to the contributions of negative problem orientation and cognitive avoidance to worry intensity in non-clinical individuals. Consequently, the contention made by Robichaud et al. (2003) that men view worry more positively than women and are thus less inclined to want to suppress worry (cognitive avoidance) has found little support in the current study.

Negative beliefs about worry were found to make a significant contribution to the worry intensity of both genders in the current study. However, the finding was only of noteworthy practical importance with regard to men. This appears to be somewhat contradictory to previous findings (Robichaud et al., 2003). Given the reported tendency for men to be more positively oriented toward worry in problem solving, as well as certain views that being labelled as or perceiving oneself as a worrier may be incompatible with the masculine identity or gender role (McCann et al., 1991; Wood, Conway & Dugas, 2005), negative perceptions of worry or beliefs that worry may be potentially harmful may contribute more

strongly to worry intensity in men than in women. However, given the limited number of studies conducted in this area and that negative beliefs about worry were found to contribute significantly to the worry intensity of both male and female participants, it would be prudent to interpret this finding with care.

The results of the current study suggest that gender does moderate the relationship between cognitive variables underlying worry and worry intensity in a non-clinical sample. However, the specific mechanisms by which this occurs are not apparent. There is some suggestion that viewing worry as a positive personality trait makes a more significant and noteworthy contribution to worry intensity among men. Thus, there appears to be a need for a more intensive investigation of the role of gender in the development and maintenance of worry, particularly from a cognitive perspective. It may be necessary not only to focus on the content and frequency of certain cognitive processes in the development and maintenance of worry, but also to investigate the manner in which gender may influence the interaction between these processes.

7.2.3 Worry/GAD status

A noteworthy proportion of the studies investigating worry, more relevantly the role of cognition in the development and maintenance of worry, appears to subscribe to the methodological convention of assigning participants to one of three categories based on their worry intensity and GAD diagnostic status (Behar et al., 2003; Chelminski & Zimmerman, 2003; Davis & Valentiner, 2000; Holaway et al., 2003; Ruscio, 2002; Ruscio & Borkovec, 2004). The current study followed this convention by categorising participants as either low worry (90.3%), high-worry non-GAD (4%) or high-worry GAD (5.7%) based on their PSWQ scores and GAD-QIV self-report diagnostic status. The prevalence of self-report-diagnosed GAD in the current sample is largely in keeping with epidemiological data for lifetime prevalence of GAD reported elsewhere (Kessler et al., 2005; Wittchen et al., 1994). The fact that the prevalence of self-report GAD so closely approximates international prevalence rates perhaps offers further evidence of a relatively high rate of cultural or educational homogeneity in the sample, especially when the wider debate on the applicability of generally accepted GAD diagnostic criteria in the wider multi-ethnic context is taken into account (Diaz et al., 2000; Lee et al., 2009; Lewis-Fernández, et al., 2010; Ruscio et al., 2005).

Moderated hierarchical regression analyses revealed that worry/GAD status moderated the relationship between cognitive constructs relevant to the AMW, MCM and IUM and worry intensity in the current sample. The current findings support the notion that differences are apparent between low-worry individuals and individuals who experience excessive worry with respect to certain cognitive variables that have been hypothesised to underpin worry (Ruscio, 2002; Ruscio & Borkovec, 2004). However, given the relatively small sizes of the high-worry non-GAD and high-worry GAD groups in the sample, the findings regarding the moderating effect of worry/GAD status should be interpreted with caution.

Analyses of the specific cognitive variables hypothesised to underlie worry revealed that positive beliefs about worry accounted for a significant amount of the variance in the worry intensity of the low-worry group, but in neither of the high-worry groups. This particular finding reflects an unresolved issue in literature on worry. Numerous authors contend that positive beliefs about worry are commonly held by all people, including those who experience excessive worry (Borkovec & Roemer, 1995; Davis & Valentiner, 2000; Freeston et al., 1994; Ruscio & Borkovec, 2004; Wells & Papageorgiou, 1998). In addition, Ruscio and Borkovec (2004) found that positive beliefs about worry are significantly related to excessive worry. However, others have demonstrated that positive beliefs about worry are significantly related to worry among low worriers, but not significantly related to worry among high worriers (Bakerman et al., 2004; Holowka et al., 2000). The results of the current study seem to support the latter view. The current study also suggests that the exact nature of the relationship between positive beliefs about worry and worry intensity is not yet understood clearly. The argument that positive beliefs about worry may play a role in the development rather than the maintenance of excessive worry (Bakerman et al., 2004) appears to be borne out by the current study. However, this assertion cannot be made with a high degree of confidence due to the small size of the two high-worry groups in the current study.

Literature suggests that negative problem orientation is related to excessive worry and that individuals suffering from GAD tend to report more negative problem orientation than controls do (Dugas et al., 1998; Dugas et al., 2004; Ladouceur et al., 1999). The findings of the current study support the existing literature to some degree. Negative problem orientation was found to account for a significant amount of the variance in worry intensity in the high-

worry GAD participants, as well as in the low-worry group. However, only the finding regarding the high-worry GAD participants was found to be of noteworthy practical importance. Thus, it seems that negative problem orientation made a specific contribution to the intensity of the worry experienced by the high-worry GAD participants. However, the lack of a similarly practically noteworthy significant finding in the high-worry non-GAD group seems to make it illogical to deduce that negative problem orientation plays a specific role in the development or maintenance of excessive worry outside the context of GAD. Furthermore, as negative problem orientation accounts for a significant amount of the variance of the worry intensity reported by the low-worry group (albeit that this finding is not considered to be of noteworthy practical importance), as well as in the high-worry GAD group, it cannot be concluded that negative problem orientation is uniquely related to GAD in some way. Apparently, additional research in this regard is required. The possibility that reliance on a self-report measure of GAD in the current study may have influenced the composition of both the high-worry non-GAD and the high-worry GAD groups should be kept in mind. Consequently, making use of more rigorous classification criteria might have yielded different results with regard to the manner in which specific cognitive variables appear to have contributed to worry intensity across worry/GAD statuses in the current study.

7.3 APPLICABILITY OF THE COGNITIVE MODELS OF WORRY

The primary aim of this study was to determine the applicability of three cognitive models of worry to the understanding of worry in a non-clinical multi-ethnic context. It has already been shown that ethnicity does not mediate the relationship between the cognitive variables included in the AMW, MCM and IUM and worry intensity in the current sample. However, it was found that gender and worry/GAD status moderate this relationship. Consequently, the applicability of the cognitive variables relevant to the three models of worry will be discussed with regard to the total sample, as well as with regard to gender and worry/GAD status. Initially, the models were dealt with in their entirety. The applicability of a combined model (a model including all the cognitive variables included in the AMW, MCM and IUM) will then be discussed. The discussion will then turn to the extent to which any of the four models (AMW, MCM, IUM and combined) has been shown to be superior to the others in accounting for worry intensity in the current sample. Finally, cognitive constructs that have

been shown to account for a significant proportion of the variance in the worry intensity of the current sample will be discussed.

7.3.1 Applicability of the avoidance model of worry and GAD

According to Borkovec and colleagues (1998), worry, particularly excessive worry, develops because of and is maintained by cognitive avoidance and positive beliefs about worry. Thus, individuals who are inclined to believe that worry aids them in solving problems and avoiding potential negative outcomes, as well as individuals inclined to use worry as a cognitive avoidance strategy to suppress somatic responses to threatening mental images are hypothesised to be at particular risk of engaging in excessive worry (Borkovec et al., 1998; Borkovec & Hu, 1990; Borkovec & Roemer, 1995). The current study found that the combination of positive beliefs about worry and cognitive avoidance accounted for significant proportions of the variance in the worry intensity of the total sample, as well as across gender and worry/GAD status. Thus, it seems that the avoidance model of worry and GAD is applicable to the understanding of worry in the South African multi-ethnic context. However, it should be borne in mind that the study made use of a non-clinical, multi-ethnic sample of university students. Therefore, this finding cannot be generalized to the broader South African multi-ethnic context, particularly because the sample consisted of only two broad ethnicities and may not reflect the role of cognitive avoidance and positive beliefs about worry in a wider range of ethnicities. Furthermore, the study made use of a non-clinical sample. Consequently, the findings cannot be generalised to more clinical populations.

7.3.1.1 Cognitive avoidance

Borkovec and colleagues (Borkovec et al., 1998; Borkovec et al., 2004; Sibrava & Borkovec, 2006) contend that the cognitive avoidance function of worry is central to the development and maintenance of excessive worry. However, in the current study, while cognitive avoidance did account for a significant proportion of the variance in the worry intensity of the total sample, across gender and for the low-worry participants, these results were not of noteworthy practical importance. Furthermore, cognitive avoidance did not account for a significant amount of the variance in the worry intensity of the two high-worry groups (both

GAD and non-GAD). Thus, the findings of the current study seem to contradict much of the cognitive literature on worry. Several studies support the role of worry as a cognitive process that assists in avoiding somatic experiences associated with intrusive mental images (Borkovec & Hu, 1990; Borkovec & Inz, 1990; Freeston et al., 1996; Hazlett-Stevens & Borkovec, 2001). It could be hypothesised that cognitive avoidance may better account for worry intensity in a western sample where ethnic influences on the experience of worry (e.g. Lewis-Fernández et al., 2010) and the applicability of cognitive constructs underlying worry (e.g. Scott et al., 2002) are less questionable. However, as it was found that ethnicity did not moderate the relationship between cognitive processes and worry intensity in the current sample, this line of reasoning seems inappropriate in this particular instance. In addition, the specific role that cognitive avoidance allegedly plays in the development and maintenance of excessive worry in the context of GAD in particular (Borkovec & Inz, 1990; Freeston et al., 1996) is not borne out in the current study, because cognitive avoidance failed to account for a significant proportion of the variance in worry intensity in either the high-worry GAD or the high-worry non-GAD groups. However, the relatively small size of the two high-worry groups could have affected the results mathematically. Consequently, these results should be interpreted carefully.

The failure of cognitive avoidance to make a significant and practically noteworthy contribution to the worry intensity of the participants in the current study may have been influenced by certain measurement issues. Borkovec and colleagues (2004) state that, although cognitive avoidance is an important element in the development and maintenance of worry, it is generally viewed as an automatic cognitive process. According to these authors, cognitive avoidance often only becomes available to conscious awareness during the therapeutic process. Consequently, there may be a chance that cognitive avoidance did play a role in the worry intensity of the current sample, but that these individuals were not aware of the cognitive avoidance they engaged in and thus could not report it. Similarly, the Cognitive Avoidance Questionnaire utilised in the current study measures explicit and implicit cognitive avoidance strategies (Sexton et al., 2004) and thus requires the individual to be consciously aware of the cognitive avoidance he/she employs. Therefore, self-report questionnaires may thus not be the most effective means of measuring cognitive avoidance in a non-clinical sample. In addition, as the current sample consisted predominantly of low-worry individuals, it could also be hypothesised that the relatively low levels of worry that

these individuals experienced did not cause them significant emotional distress or were not employed in an attempt to avoid or replace distressing mental images. Consequently, the majority of individuals in the current sample may not have needed to make use of cognitive avoidance strategies in any meaningful way. However, this does not explain the apparent absence of cognitive avoidance in the high-worry groups. This may be due to the lack of conscious awareness and measurement issues discussed above.

7.3.1.2 Positive beliefs about worry

The results of the current study suggest that the second component of the AMW, positive beliefs about worry, accounts for a significant proportion of the variance in the worry intensity of the total sample, both genders and the low-worry participants. A number of studies concluded that most individuals hold positive beliefs about worry (Borkovec & Roemer, 1995; Davis & Valentiner, 2000; Freeston et al., 1994; Ruscio & Borkovec, 2004; Wells & Papageorgiou, 1998). Thus, the current findings appear to provide further support for the widespread prevalence of positive beliefs about worry in non-clinical populations. Similarly, a number of researchers (Bakerman et al., 2004; Cartwright-Hatton & Wells, 1997; Holowka et al., 2000; Wells & Carter, 2001; Wells & Papageorgiou, 1998) previously reported the contribution of positive beliefs about worry to worry intensity among normal worriers or low worriers reflected in this study. However, the present findings appear to contradict the notion that positive beliefs about worry are common amongst individuals that experience excessive worry, particularly in the context of GAD (Davis & Valentiner, 2000; Ruscio & Borkovec, 2004; Wells & Carter, 2001). The current study suggests that positive beliefs about worry do not significantly contribute to worry intensity among highly worried individuals (including those with and without GAD). This finding appears to be in line with studies that demonstrated that positive beliefs about worry were significantly related to worry at low levels of worry, but were unrelated to worry at high (excessive) levels of worry (Bakerman et al., 2004; Holowka et al., 2000). Bakerman and colleagues (2004) argue that positive beliefs about worry may play an important role in the development rather than in the maintenance of excessive worry. These authors hypothesise that, as worry intensity increases, positive beliefs about worry become less prevalent and other processes contribute more significantly to the maintenance of excessive worry. The results of the current study appear to support this hypothesis.

Most of the existing research on positive beliefs about worry primarily treated this construct as a unitary entity. However, some researchers highlight specific types of positive beliefs about worry. Worry is said to be perceived as useful in problem solving and as increasing one's motivation (Borkovec & Roemer, 1995; Cartwright-Hatton & Wells, 1997), as well as a means of preventing and minimizing negative outcomes (Borkovec & Roemer, 1995; Freeston et al., 1994) or as a positive personality trait (Cartwright-Hatton & Wells, 1997). In the current study, specific positive beliefs about worry emerged as significant contributors to the worry intensity of the participants. More specifically, perceiving worry as a source of motivation accounted for a significant and practically noteworthy proportion of the variance in the worry intensity of the total sample and both genders. This finding supports previous research that suggests that specific positive beliefs about worry may demonstrate a particular relationship to the development and maintenance of worry (Borkovec & Roemer, 1995; Cartwright-Hatton & Wells, 1997). Perceiving worry as a positive personality trait was found to account for a significant and practically noteworthy proportion of the variance in the worry intensity of the male participants in the present study. This corresponds with findings published by Cartwright-Hatton and Wells (1997) that highlight the role of viewing worry as a positive personality trait in the development and maintenance of worry. Gender differences were evident with regard to the extent to which certain positive beliefs about worry, specifically viewing worry as a positive personality trait, accounted for the variance in the worry intensity of the current sample. This finding was discussed earlier in the current discussion.

7.3.2 Applicability of the metacognitive model of GAD

The metacognitive model of GAD (Wells, 1995) postulates that the vast majority of people hold positive beliefs about worry, and that these beliefs reinforce the perceived efficacy of worry as a means of coping. Negative beliefs about worry and attempts to control or avoid worry or worry-related stimuli facilitate the development and maintenance of excessive worry, and eventually result in GAD. The results of the current study reveal that the combination of positive beliefs about worry, negative beliefs about worry and cognitive control strategies account for a significant proportion of the variance in the worry intensity of the total sample, as well as across gender and worry/GAD status. Thus, it appears that the metacognitive model of GAD is applicable to the understanding of worry in the South

African multi-ethnic context. However, as highlighted in the preceding discussion on the applicability of the AMW, the specific composition of the current sample limits the extent to which this finding can be generalized across all ethnicities and to non-student and clinical populations.

7.3.2.1 Positive beliefs about worry

As in the AMW, positive beliefs about worry account for a significant proportion of the variance in the worry intensity of the total sample, both genders and among the low-worry participants in the current study. Further, these findings seem to underscore the role that positive beliefs about worry play in non-excessive worry or normal worry. Similar to the results of the AMW, the analyses involving the MCM reveal that positive beliefs about worry do not appear to make a significant and practically noteworthy contribution to worry intensity in the high-worry non-GAD or the high-worry GAD group. This finding offers additional support to the claim by Bakerman and colleagues (2004) that positive beliefs about worry appear to play a role in the development of worry, but that other processes may be responsible for the intensification and maintenance of worry that is associated with GAD and other anxiety disorders.

The results of the MCM analyses reveal that specific positive beliefs about worry account for a significant proportion of the worry intensity of the total sample, the female participants, the male participants and the low-worry participants. Similar to the results of the analysis involving the AMW, viewing worry as a source of motivation made a significant and practically noteworthy contribution to the worry intensity of the total sample, both genders and the low-worry participants. This result further supports the claims made by various researchers that worry is perceived by many non-clinical individuals as making a positive contribution to their functioning by increasing their motivation in certain ways (Borkovec & Roemer, 1995; Cartwright-Hatton & Wells, 1997). The findings with respect to specific positive beliefs about worry in the context of the MCM were also similar to those in the AWM in that, additional to the contribution of worry as a source of motivation, viewing worry as a positive personality trait accounted for a significant proportion of the variance in the worry intensity of the male participants. However, unlike the AWM analyses, the MCM analyses also found that viewing worry as an aid in problem solving made a significant and

practically noteworthy contribution to the worry intensity of the male participants. These findings seem to support the limited literature on gender differences in positive beliefs about worry. Robichaud and colleagues contend that males are inclined to view worry in a more positive light than women do (Robichaud et al., 2003).

7.3.2.2 Negative beliefs about worry

According to the metacognitive model of GAD (Wells, 1995), the activation of Type 2 worry, specifically negative beliefs about worry, is central to the development of excessive and uncontrollable worry. Moreover, numerous studies suggest that negative beliefs about worry are significantly associated with excessive and uncontrollable worry (Cartwright-Hatton & Wells, 1997; Davis & Valentiner, 2000; Ruscio & Borkovec, 2004; Wells, 1999a; Wells & Carter, 2001). It was reported that individuals suffering from GAD held significantly more negative beliefs about worry than individuals presenting with sub-clinical levels of anxiety and worry, and non-anxious controls (Cartwright-Hatton & Wells, 1997; Davis & Valentiner, 2000; Ruscio & Borkovec, 2004; Wells, 2005; Wells & Carter, 2001). Thus, it would have been reasonable to expect negative beliefs about worry to make a significant contribution to the worry intensity of the high-worry non-GAD and high-worry GAD participants in the current study. Furthermore, negative beliefs about worry may have been expected to make a more significant contribution to the worry intensity of these groups than to the worry intensity of the low-worry participants. However, this does not appear to have been the case. The current study found that negative beliefs about worry did not account for a significant proportion of the variance in the worry intensity of the high-worry non-GAD or the high-worry GAD participants. Conversely, negative beliefs about worry were found to make a significant contribution to the worry intensity of the total sample, as well as to the female, male and low-worry participants in the current study. However, these results are not considered to be of noteworthy practical importance because all of them indicate small effect sizes. Nonetheless, a trend appears evident in which negative beliefs about worry may be more relevant to the worry experience of the non-clinical individuals than to that of the excessive worriers in the current sample.

The results reported above appear to contradict a major tenet of the metacognitive model of GAD, namely that negative beliefs about worry not only distinguish excessive worriers from others, but that negative beliefs make a significant contribution to the development and maintenance of excessive worry. However, caution should be exercised in interpreting these results. First, the current sample is primarily non-clinical in nature. Consequently, these findings need to be replicated in clinical samples before the role of negative beliefs about worry in the development and maintenance of excessive and uncontrollable worry can be questioned. Second, the GAD and high-worry non-GAD groups in the current sample were relatively small, which may have had an effect on certain findings reaching statistical significance or being judged to be of noteworthy practical importance. The allocation of individuals to the GAD group was also based entirely on self-report. This, too, could have skewed the composition of the groups. However, negative beliefs about worry also failed to account for a significant proportion of the variance in the worry intensity of the high worriers who did not receive a self-report GAD diagnosis.

7.3.2.3 Thought-control strategies

In the context of the MCM, thought-control strategies such as thought suppression and cognitive avoidance are hypothesised to play a role in the maintenance and possibly the intensification of excessive and uncontrollable worry (Coles & Heimberg, 2005; Wells, 1995). However, in the current study, thought control and cognitive avoidance failed to account for a significant and practically noteworthy proportion of the variance in the worry intensity of the total sample or with regard to gender or worry/GAD status. Thus, the current findings tend to bring the role that cognitive avoidance and thought-control strategies (in the MCM) are hypothesised to play in the maintenance and intensification of excessive worry into question. However, according to the MCM, thought-control strategies are implemented in reaction to negative beliefs about worry (Wells, 1995; Wells, 1999b). Given that negative beliefs about worry appear not to contribute to the worry intensity of the current sample, it could be argued that no catalyst for the activation of thought-control strategies is apparent in this sample. This may point more to sampling and measurement issues than to theoretical inconsistencies per se. In addition, the questions raised with regard to the conscious awareness of cognitive avoidance strategies in the discussion on the AMW should also be considered with regard to the measurement of thought-control strategies.

7.3.3 Applicability of the intolerance of uncertainty model

The intolerance of uncertainty model proposes that intolerance of uncertainty, positive beliefs about worry, cognitive avoidance and negative problem orientation all contribute to the development and maintenance of excessive and uncontrollable worry (Buhr & Dugas, 2002; Dugas et al., 2005; Ladouceur et al., 1999; Ladouceur et al., 1998). However, intolerance of uncertainty is considered to play a central role in the development of worry and is hypothesised to underlie or influence the other three cognitive processes included in the model. Although relatively few studies to date appear to have included all four elements of the model, those that have demonstrated a significant relationship between each of the four elements of the model and worry (Dugas et al., 1998, Dugas et al., 2007; Dugas et al., 2005; Ladouceur et al., 1998; Laugesen et al., 2003; Robichaud et al., 2003). Furthermore, each of the four cognitive processes comprising the IUM has been shown to be individually associated with worry (Dugas et al., 1998; Robichaud et al., 2003). The findings of the present study seem to support the preceding literature in that all four elements of the IUM were found to account for a significant percentage of the variance in the worry intensity of the total sample, as well as across gender and worry/GAD status. Thus, the findings of the current study seem to suggest that the intolerance of uncertainty model is applicable to the understanding of worry in the multi-ethnic South African context. However, as with the AMW and the MCM, the specific composition of the current sample limits the extent to which this finding can be generalized across all ethnicities and to non-student and clinical populations.

7.3.1.1 Intolerance of uncertainty

Contrary to much of the existing literature, the current study found that intolerance of uncertainty did not account for a significant proportion of the variance in the worry intensity of the male participants, the high-worry non-GAD participants and the high-worry GAD participants. Moreover, while intolerance of uncertainty accounts for a significant percentage of the variance in the worry intensity of the total sample, as well as among the female and low-worry participants, these findings were found to be of limited practical importance. Consequently, intolerance of uncertainty does not appear to make a significant and practically

noteworthy contribution to the worry intensity of the current sample. However, the specific composition of the current sample limits the extent to which this finding can be generalized across all ethnicities, as well as to non-student and clinical populations.

The current findings appear to contradict studies that have demonstrated that a significant relationship exists between intolerance of uncertainty and worry, not only in non-clinical samples (Dugas et al., 2001; Ladouceur et al., 1999), but also among individuals suffering from GAD and high worriers who did not meet the diagnostic criteria for GAD (Buhr & Dugas, 2002; Dugas et al., 1997; Dugas et al., 1998). In addition, individuals suffering from GAD have been found to report higher levels of intolerance of uncertainty than individuals suffering from other anxiety disorders and non-clinical controls (Dugas et al., 2005; Ladouceur et al., 1999). The contradiction with regard to previous findings on excessively worried individuals who do not meet the criteria for GAD, as well as for individuals suffering from GAD may be partially attributed to the relatively small size of the two high-worry samples in the current study. In addition, recent literature highlights problems with the Intolerance of Uncertainty Scale (IUS), which was used as a measure of intolerance of uncertainty in the current study. It is claimed that the IUS measures general reaction to uncertainty rather than the tendency to consider uncertainty to be intolerable or unacceptable (Gosselin et al., 2008; Norton, 2005). Therefore, the construct validity of the IUS could be in question (Carleton, Norton & Asmundson, 2007). Furthermore, Norton (2005) reports that, while the IUS demonstrated high levels of internal consistency in a multi-ethnic North American sample, the measure failed to demonstrate a consistent factor structure across ethnicity. Thus, the findings of the current study could possibly be a reflection of measurement limitations rather than indicative of theoretical inconsistency in the IUS. However, Sexton and Dugas (2007) were able to confirm a two-factor structure for the IUS that was consistent across four ethnicities in a North American sample. In addition, Buhr and Dugas (2002) report acceptable convergent and divergent validity for the IUS. Taken together, the preceding discussion seems to indicate that more research is needed on the construct validity of the IUS, specifically across ethnicity. Only once this measure has been shown to measure intolerance of uncertainty specifically can responsible deductions be drawn from intolerance of uncertainty research in a multi-ethnic context.

7.3.1.2 Positive beliefs about worry

As with the AMW and the MCM, positive beliefs about worry were found to account for a significant proportion of the variance in the worry intensity of the total sample, the female participants, the male participants and the low-worry participants. Once again, positive beliefs about worry failed to account for a significant and practically noteworthy percentage of the variance in the worry intensity of the two high-worry groups. These findings continue to suggest that positive beliefs about worry play a significant role in the worry intensity of non-clinical low worriers, while not significantly contributing to the worry intensity of excessive worriers. However, once again, these results cannot be generalized confidently outside a non-clinical student population. The small size of the two samples of high worriers also underscores the need to replicate these results in clinical populations before specific conclusions can be drawn regarding the role of positive beliefs about worry in excessive worry.

Analyses of the contribution of specific positive beliefs about worry to worry intensity in the context of the IUM continue to demonstrate that viewing worry as a source of motivation accounted for a significant and practically noteworthy percentage of the variance in the worry intensity of the female participants, while perceiving worry to be a positive personality trait continues to account for a significant and practically noteworthy proportion of the variance in the worry intensity of the male participants. These findings continue to underscore the relevance of these two specific positive beliefs about worry to the worry of non-clinical men and women. Similarly, the limitations alluded to in the discussion on positive beliefs about worry in the two previous models are also relevant in this instance.

7.3.1.3 Negative problem orientation

The current study indicates that negative problem orientation accounts for a significant percentage of the variance in the worry intensity of the total sample, both genders, the low-worry participants and the high-worry GAD participants. However, only the results pertaining to the high-worry GAD group are deemed to be of noteworthy practical importance. Consequently, negative problem orientation appears to make a significant and

noteworthy contribution only to the worry intensity of the high-worry GAD participants in the current study.

Considering this finding, it seems that negative problem orientation might be specifically related to individuals suffering from GAD. In general, literature suggests that negative problem orientation is related to excessive worry and that individuals suffering from GAD tend to report more negative problem orientation than non-clinical controls (Dugas et al., 1995; Dugas et al., 1997; Dugas et al., 1998; Dugas et al., 2004; Ladouceur et al., 1999). Robichaud and Dugas (2005b) report that negative problem orientation appears to demonstrate greater specificity to worry than to depression. However, these authors suggest that future research should compare the specificity of negative problem orientation to excessive worry and GAD to other anxiety disorders.

The current finding that negative problem orientation accounts for a significant and noteworthy percentage of the variance in the worry intensity in GAD could be viewed as supporting a specific link between problem orientation and excessive worry. This seems logical because excessive worry is widely considered the central feature of GAD (Barlow, 2002; Dugas & Robichaud, 2007) and a possible mechanism by which GAD develops (Borkovec et al., 1998; Dugas et al., 1998; Mennin et al., 2002; Roemer & Orsillo, 2002; Wells, 1995). However, the apparent failure of negative problem orientation to contribute significantly to the worry intensity reported by the high-worry non-GAD participants in the study suggests that negative problem orientation may play a specific role in GAD, but not necessarily in excessive worry. However, this conclusion seems counterintuitive given that excessive worry and GAD are reported to be strongly related to one another (Chelminski & Zimmerman, 2003; Craske et al., 1989; Dugas & Robichaud, 2007). Moreover, the composition of the current sample and the use of self-report measures to assign GAD status necessitate the replication of these findings in more controlled conditions and in a variety of clinical populations before any firm conclusions can be drawn with regard to the specificity of negative problem orientation to GAD.

7.3.1.4 Cognitive avoidance

Cognitive avoidance accounted for a significant proportion of the variance in the worry intensity of only the total sample and the female participants in the current study. However, these findings were judged not to be of noteworthy practical importance. Consequently, as with the AMW and the MCM, cognitive avoidance or cognitive control strategies continue to fail to make a significant and noteworthy contribution to worry intensity in a non-clinical multi-ethnic sample of South African students. However, as mentioned previously, measurement of cognitive avoidance strategies may have been negatively influenced because of these strategies possibly not being available to the conscious awareness of the participants in the present study. Furthermore, the need to engage in cognitive avoidance may not be as strong in a predominantly non-clinical sample as it may be in a sample of individuals who experience significantly elevated levels of worry and report associated negative beliefs about worry or more severe intolerance for uncertainty than are reported by the current sample. Consequently, this particular finding, while consistent across all three models, cannot be readily generalized outside a non-clinical sample.

7.3.4 Applicability of a combined cognitive model of worry

The final step in determining the applicability of three cognitive models of worry to the understanding of worry in the South African context seems to require determining to what extent a combination of all the cognitive processes comprising the AWM, MCM and the IUM could account for the variance in the worry intensity of a multi-ethnic non-clinical sample. The overlap that is apparent in the three models with regard to common cognitive processes (e.g. positive beliefs about worry and cognitive avoidance) and the findings related to the contribution of one of these common processes (positive beliefs about worry) to the worry intensity of the current sample further emphasizes the need to explore the applicability of a combined model.

The results of the study suggest that a combined cognitive model of worry – consisting of all the components comprising the AMW, MCM and IUM – accounts for a significant percentage of the variance in the worry intensity of the total sample, both genders and all

three worry/GAD statuses. In the combined model, positive beliefs about worry were found to account for a significant and practically noteworthy proportion of the variance in the worry intensity of the total sample, both genders and the low-worry participants. However, as with the three cognitive models of worry, positive beliefs about worry did not account for a significant and practically noteworthy percentage of the variance in the worry intensity of the two high-worry groups. This finding provides further evidence for the significant role that positive beliefs about worry appear to play in the worry intensity of non-clinical individuals. As discussed previously, this finding is in line with the majority of research on the role of positive beliefs about worry in normal or non-clinical worry (Bakerman et al., 2004; Borkovec & Roemer, 1995; Davis & Valentiner, 2000; Freeston et al., 1994; Holowka et al., 2000; Ruscio & Borkovec, 2004; Wells & Carter, 2001; Wells & Papageorgiou, 1998). The gender-specific pattern regarding the contribution of specific positive beliefs about worry to worry experienced by non-clinical individuals with regard to the AMW, MCM and IUM was again reflected in the combined model. The perception that worry served as a form of motivation accounted for a significant and practically noteworthy proportion of the variance in the worry intensity of the female participants, while considering worry to be part of a positive personality accounted for a significant and practically noteworthy percentage of the variance of the worry intensity reported by the male participants in the current study. Thus, while positive beliefs about worry contribute to the worry intensity of non-clinical males and females, differences in the specific content or nature of these positive beliefs appear evident.

Differences in proportional variance were also calculated to determine whether the combination of the cognitive processes from all three of the cognitive models of worry was able to account for a significantly greater proportion of the variance in the worry intensity of a non-clinical multi-ethnic sample. The results of this analysis revealed that the combined model predicted a significantly greater proportion of the worry intensity of the total sample, the male participants, the female participants and the low-worry participants in all three instances. However, only the ability of the combined model to account for a significantly greater proportion of the variance in worry intensity than the AMW appears to be of noteworthy practical importance. Thus, it can be deduced that a combination of the cognitive processes comprising the three models of worry under investigation is only superior to the AMW in accounting for a significant proportion of the variance in the worry intensity in all participants in the current study, except for the high-worry participants. However,

considering that cognitive avoidance has consistently failed to account for a significant proportion of the worry intensity of the current sample and that this specific cognitive construct appears to play a more central role in the AMW than in the other two models, the inferior ability of the AMW to account for the worry intensity of participants in the current study may be mainly due to the importance that the model ascribes to cognitive avoidance in the development and maintenance of worry.

7.4 CONCLUSIONS

The primary aim of this study was to explore the applicability of three cognitive models of excessive worry (AMW, MCM and IUM) in a multi-ethnic context. The individual applicability of these models to clinical, and to a lesser extent, to non-clinical contexts was investigated previously. However, the current study appears to be the first to compare these three cognitive models of worry in a non-clinical multi-ethnic sample. Overall, all three cognitive models of worry (AMW, MCM and IUM) appear to be applicable to the understanding of normal or non-clinical worry in the multi-ethnic South African context. However, it should be noted that ethnicity did not significantly moderate the relationship between the cognitive processes underlying the three models of worry and worry intensity in the current sample. Nonetheless, gender and worry/GAD status were found to moderate this relationship significantly. The findings from the current study thus seem to support gender and diagnostic status differences in the cognitive processes underlying worry, but do little to promote current understanding of the role of ethnicity with regard to these processes. All three cognitive models of worry were found to account for a statistically significant proportion of the variance of the worry intensity reported by the sample. These findings were consistent across gender and worry/GAD status. Moreover, a model combining the cognitive processes from all three models was also able to account for a significant proportion of the worry intensity reported by the current sample. When the three models were compared to one another as well as to the combined model, it was found that only the AMW accounted for a significantly lower proportion of the variance in worry intensity of the sample as a whole, as well as across gender and worry/GAD status. Thus, while all three cognitive models of worry appear to be applicable to the understanding of non-clinical or normal worry in a multi-ethnic

context, the AMW appears to be less applicable than the other two models and a model consisting of the cognitive processes included in all three models of worry.

At the level of specific cognitive processes, only positive beliefs about worry appear to have accounted for a significant proportion of the worry intensity of the normal or non-clinical worriers across all four models (AMW, MCM, IUM and the combined model). Thus, the current study appears to support the majority opinion in the cognitive literature on worry that viewing worry as adaptive or useful tends to increase the use of worry as a coping strategy in non-clinical individuals. This trend appears to be evident in a multi-ethnic setting as well. Moreover, the current study supports the contention that positive beliefs are related significantly to low levels of worry intensity, but not to excessive worry. In addition, the current study revealed a gender-specific pattern regarding the contribution of particular positive beliefs about worry to the understanding of normal or non-clinical worry across all three cognitive models of worry. Generally viewing worry as an effective means of motivation appears to increase the likelihood that women will make use of worry as a coping strategy, while men appear more inclined to do so if they perceive their worry to reflect a positive aspect of their personality. These findings appear to be consistent with the limited research that was conducted on gender differences regarding the cognitive processes underlying normal worry.

The current study provides some evidence for a specific link between negative problem orientation and GAD. This finding, while in keeping with existing research in this area, should be interpreted with care, as certain reservations exist with regard to the categorisation of participants into diagnostic categories based on self-report measures, as well as the size of the GAD groups in the current study. In addition, the current study was not able to establish that negative beliefs about worry, intolerance of uncertainty, negative problem orientation or cognitive avoidance made a significant contribution to the worry experienced by normal or non-clinical individuals in a multi-ethnic setting. Moreover, contrary to much of the existing theoretical and empirical literature, intolerance of uncertainty, negative beliefs about worry and cognitive avoidance were found not to make significant contributions to the worry experienced by excessive worriers, irrespective of their self-reported GAD diagnostic status. Thus, the current study appears to have raised a number of questions regarding the applicability of the three cognitive models of worry and their specific components to the

understanding of worry, particularly excessive worry, in the multi-ethnic South African context. However, much more research is required in this area before any meaningful conclusions can be reached.

7.5 LIMITATIONS

Certain limitations should be highlighted with regard to the current study. First, the current sample was comprised of a convenience sample of university students. Consequently, the findings of the study cannot be generalized validly beyond this particular population. Generalizing the results of the current study to individuals with relatively low levels of formal education or from particularly deprived socio-economic backgrounds would be inappropriate. It would be advisable to replicate this study in a randomly selected cross-sectional sample of South African citizens.

Second, the finding that the relationship between the cognitive processes hypothesised to underpin worry and worry intensity is not moderated by ethnicity cannot be generalized beyond the current sample. Participants in the current study would be considered to be relatively westernised, given their socio-economic status and the duration of their exposure to predominantly westernized systems of formal education. Consequently, these individuals may not be entirely representative of the views and attitudes held by others from their particular ethnic groups. Furthermore, the current study made use of a relatively narrow operationalisation of ethnicity (black/Caucasian). The current sample is not representative of the full range of ethnic diversity in South Africa. In addition, the current student sample could be viewed as homogenous with regard to their daily experiences and developmental concerns. As a result, it could be hypothesised that common situational influences have possibly outweighed ethnic or cultural differences in the current study.

Third, worry intensity served as the criterion variable in the current study. Consequently, the findings of this study cannot speak to the role of cognitive processes, ethnicity, worry/GAD status and gender in the content, nature or uncontrollability of worry in the South African context. This is a particularly important limitation to bear in mind, given that most of the work on ethnicity or culture and worry to date has focussed on the content and

uncontrollability of worry (Diaz et al., 2000; Lee et al., 2009; Ruscio et al., 2005; Scott et al., 2002).

Fourth, the current sample was comprised predominantly of low-worry individuals. Consequently, the findings cannot be applied to the understanding of cognitive processes in the development and maintenance of clinical worry or worry specifically occurring in the context of psychopathology. The findings of this study would have to be replicated in a variety of clinical samples before these findings could be generalised beyond the context of normal or low worry. In addition, the high-worry non-GAD and high-worry GAD groups included in the study were relatively small. Therefore, it is possible that findings that did not approach statistical significance or were not judged to be of noteworthy practical importance may be an artefact of the size of the specific sample rather than of the character or dynamics of worry in highly worried individuals as such. Furthermore, the use of self-report GAD diagnostic status to classify individuals as high-worry GAD or high-worry non-GAD is not the most stringent method for assigning clinical status. The composition of these specific samples may thus have been influenced by the particular methodology adopted in the study. However, the prevalence of self-report-diagnosed GAD in the current sample fell within the lifetime prevalence range reported within the general population internationally (Kessler, et al., 2005; Wittchen et al., 1994). In addition, all individuals who were classified as GAD also scored above the cut-off for excessive worry on the PSWQ. Nonetheless, the current findings as they relate to high-worry and GAD should not be generalised beyond this particular sample and certainly not to clinical populations.

Fifth, the current study was largely exploratory in nature. As such, it aimed primarily to determine the applicability of three models of excessive worry to the understanding of worry intensity in a specific sample. The primary goal was to determine to what extent each model, and the individual elements of each model, could account for the variance in the worry intensity of the current sample. Consequently, the methodology and analyses employed are not suitable to answer questions regarding the structure of the relevant models or the specific interaction or contribution of the specific constructs comprising each model. It is perhaps worth noting that, to the best of the researcher's knowledge, no studies have attempted to explore the hypothesised interaction of the constructs in the relevant cognitive models of

worry empirically. However, empirical investigation of these chiefly theoretical models via structural equation modelling or similar analyses is necessary.

Sixth, the current study was cross-sectional in nature and as such provides limited insight into the development and maintenance of non-clinical and excessive worry. More longitudinal approaches may be better suited to understanding the contribution of specific cognitive processes to worry over time. Furthermore, longitudinal studies may provide more insight into the interaction between various processes within the respective models of worry over time, as well as across the development-maintenance continuum of worry.

Finally, a number of constructs that have been linked theoretically and empirically to the development and maintenance of worry, such as cognitive avoidance, negative beliefs about worry and intolerance of uncertainty, were not found to account for a significant proportion of the worry intensity of the current sample. As a result, the possibility of measurement problems and the construct validity of some of the measures used in the current study must be considered. This is of particular relevance to questions surrounding the extent to which cognitive avoidance is available to conscious awareness in low-worry individuals and the effect that this has on the accurate measurement of this process. Also, the construct validity of the TCQ (Fehm & Hoyer, 2004), IUS (Carleton et al., 2007; Gosselin et al., 2008; Norton, 2005) and the CAQ (Sexton & Dugas, 2008) has been debated in the literature. Similarly, the validity of the MWQ appears to have been investigated in only one study (Wells, 2005), and while the MCQ-30 is frequently used in applied research on metacognition, no research appears to have investigated the construct or external validity of the measure. Consequently, definite conclusions regarding the constructs reportedly measured by these instruments should not be drawn before the findings of the current study have been replicated by either making use of more qualitative methods or after having developed more appropriate measuring instruments. Thus, although the current study investigated the applicability of three cognitive models of worry to the understanding of worry, it aimed to investigate whether three cognitive models of excessive worry (individually, or in combination) were able to account for a significant amount of the variance in the worry intensity of low worriers (in normal worry) and high worry (both GAD and non-GAD). Although this study investigated the specific elements of each model (individually and in combination), the methodology of this study did not allow for the investigation of the nature of interactions

between the specific aspects or elements of each model. Such an investigation could possibly have provided important information about specific mechanisms of interaction between the cognitive variables, as well as between cognitive variables and excessive worry.

7.6 FUTURE RESEARCH AND PRACTICAL IMPLICATIONS

As with most exploratory studies, the value of the current study appears to be that it has taken the first step in attempting to understand the applicability of existing cognitive models of worry in the multi-ethnic South African context. The current study has also enhanced understanding of the contribution of specific cognitive processes to the development and maintenance of worry in a non-clinical context. The contribution of this particular study appears to be with regard to the theoretical understanding of predominantly normal or non-clinical worry in a multi-ethnic context from a cognitive perspective. Consequently, the areas of potential research identified in the process of conducting this study and in terms of its findings appear to be predominantly with regard to promoting understanding of the utility, structure and dynamics of cognitive models of worry in the applied multi-ethnic non-clinical and clinical contexts. Moreover, the current implications of the current study appear to be related to issues of methodology rather than to clinical or therapeutic application per se.

Given that the current sample was a convenience sample of university students, it is necessary to replicate this study, specifically with regard to normal or non-clinical worry, in a more representative multi-ethnic sample. More specifically, there would be value in replicating this study in samples with a wider age range, samples stratified with regard to socio-economic status and samples stratified with regard to education and possibly also with regard to ethnic identity. The latter would help to ascertain whether the degree to which individuals identify with their particular ethnicity and are resistant to influences of other ethnicities in any way affects the interaction between cognitive processes and worry in these specific individuals.

The findings of the current study cannot be generalised to clinical samples. Consequently, there is a definite need to replicate this study among individuals from various ethnicities suffering from anxiety disorders in general and GAD in particular. Studies such as these

appear to be of particular importance, given the lack of support for the role of specific cognitive processes in the development and maintenance of excessive worry in the current study. Future research in this regard would do well to make use of multiple criteria (e.g. self-report measures and structured diagnostic interviews) for assigning individuals to diagnostic categories. The conclusions reached in these studies may be more clearly attributable to diagnostic status than is currently the case.

The finding that ethnicity does not moderate the relationship between cognitive processes and worry intensity in the current sample perhaps poses more questions than it provides answers. Additional research is required in this regard. Future studies should attempt to make use of samples that more accurately reflect the ethnic and cultural diversity of the broader South African society. Drawing samples that provide a more nuanced ethnic picture than that provided by the current black/Caucasian dichotomy would be a significant step in attempting to understand the interplay between ethnicity, cognition and worry more clearly. Similarly, the majority of cross-cultural or multi-ethnic research published in the field of worry appears to relate more to the content of worry than to worry intensity. Thus, it may be necessary to first develop a better understanding of any ethnic or cultural differences in the expression or structure of worry before attempting to measure the intensity of worry across ethnicities or trying to link worry intensity to specific cognitive processes. A greater understanding of the specific character and structure of worry across ethnicities may be an important step in developing a measure of worry intensity that is more relevant to the multi-ethnic context.

The results of the study, specifically with regard to the lack of a specific link between cognitive processes hypothesised to underpin excessive worry and high levels of worry, raise questions with regard to the construct validity and/or cross-ethnic utility of certain measuring instruments. More research seems to be necessary to determine the psychometric properties of these instruments in a truly multi-ethnic and multilingual context. Pending the outcome of the aforementioned research, there may be a need to develop measures of worry intensity that are more relevant as well as measures that are more efficient in eliciting or identifying cognitive processes involved in worry across various ethnicities.

Finally, there appears to be merit in more in-depth analyses of individual models of worry. Future research could build on the findings of the current exploratory study by attempting to

determine the utility of the specific models of worry to the experience of normal worry and to a variety of clinical conditions individually. Structural equation modelling could be employed to provide a clearer impression of the interaction between the specific components of each model with regard to normal and excessive worry across ethnicities. This approach possibly may more readily identify elements or relationships within the specific theoretical models that are less effective in explaining worry across ethnicities. Longitudinal studies may also provide better insight into how worry develops overtime and possibly across ethnicity or gender. Longitudinal studies could shed light on variations in the role of specific contribution of particular cognitive processes to non-clinical and excessive worry over time, as well as on the specific manner in which cognitive processes may facilitate the progression from non-clinical to excessive or clinical worry within individuals over time. Mixed methods (quantitative and qualitative) and approaches to understanding how specific cognitive processes and interactions result in the experience of worry across ethnicities may also be of value in developing a clearer understanding of worry in the multi-ethnic context. Although costly, studies making use of laboratory-based cognitive paradigms may be the most effective means of investigating the contribution of specific cognitive processes to the experience of worry across ethnicities.

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APPENDIX A

CONSENT TO PARTICIPATE IN RESEARCH

We are currently investigating the different processes underlying worry, as well the eating habits of university students. We are also interested in the general health and emotional wellbeing of these individuals.

You as a student would thus be able to provide us with valuable information regarding these issues. However, participation in this project is totally voluntary, and you will not be negatively influenced should you choose not to participate. You may also withdraw from the study at anytime. You will incur no additional expense by participating in the study.

Should you agree to participate in the study, you will be required to complete the attached questionnaires. If you do wish to participate in the study please sign this consent form and complete the questionnaires. Once you have completed it, you may hand it back to the person who gave it to you.

The results of this research may be published in a scientific journal. However, your identity and personal information will remain strictly confidential. You may contact ms. Chrisma Pretorius (PhD Student and Counseling psychologist) or ms. Marnell van Rooyen (Masters student) at 051-401 2775 with any questions you may have regarding the research.

I hereby voluntarily **agree** to participate in the abovementioned study.

Signature of participant

Date

TOESTEMMING OM AAN DIE NAVORSING DEEL TE NEEM

Ons is tans besig om die verskillende prosesse onderliggend aan bekommernis (“worry”) sowel as individue se eetgewoontes onder univesiteitstudente te ondersoek. Ons is ook geïnteresseerd in hierdie individue se algemene gesondheid en emosionele welstand.

U as student sal dus aan ons waardevolle inligting oor hierdie aspekte kan verskaf. Deelname aan hierdie projek is egter heeltemal vrywillig en indien u kies om nie deel te neem nie, sal dit u geensins benadeel nie. U mag op enige stadium van hierdie studie onttrek. U sal geen addisionele uitgawes aangaan met die deelname aan hierdie studie.

Indien u instem om aan die studie deel te neem, sal dit van u verwag word om die aangehegte vraelyste in te vul. Indien u wil deelneem, teken asseblief hierdie toestemmingsvorm en voltooi die vraelyste.

Die resultate van hierdie navorsingsprojek mag moontlik in ‘n wetenskaplike tydskrif gepubliseer word. U identiteit en persoonlike inligting sal egter streng vertroulik bly. U kan me. Chrisma Pretorius (PhD student en Voorligtingsielkundige) of me. Marnell Van Rooyen (Meestersgraad-student) kontak by telefoon 051-401 2775 indien u enige vrae rakende die navorsing het.

Hiermee **stem ek vrywillig in** om aan bogenoemde projek deel te neem.

Handtekening van deelnemer

Datum

APPENDIX B

AFRIKAANS TRANSLATION OF THE GENERALIZED ANXIETY QUESTIONNAIRE – IV (GADQ-IV)

- 1 Ervaar jy oormatige bekommernis (“worry”)? Ja _____ Nee _____
- 2 Is jou bekommernis (“worry”) oormatig met betrekking tot intensiteit, gereeldheid, of hoeveelheid ongemak wat dit veroorsaak? Ja _____ Nee _____
- 3 Vind jy dit moeilik om jou bekommernis (“worry”) te beheer (of om op te hou om jou te bekommer) as dit eers begin het? Ja _____ Nee _____
- 4 Bekommer (‘worry’) jy jou oormatig en onbeheerbaar oor nietige dinge soos om laat te wees vir ‘n afspraak, nietige herstelwerk, tuiswerk ens.? Ja _____ Nee _____
- 5 Lys asseblief die onderwerpe waaroor jy jou die meeste oormatig en onbeheerbaar bekommer:

a. _____	d. _____
b. _____	e. _____
c. _____	f. _____
- 6 Is jy gedurende die **laaste ses maande** lastig geval deur oormatige en onbeheerbare bekommernisse vir meer dae as glad nie? Ja _____ Nee _____

INDIEN JA, GAAN VOORT; INDIEN NEE, IGNOREER DIE OORBLYWENDE VRAE.

- 7 Hoe gereeld is jy die afgelope 6 maande lastig geval deur enige van die volgende simptome? Merk asseblief elke simptoom wat vir meer dae aanwesig was as glad nie:

_____ Rusteloos of opgewerk voel
_____ Geïrriteerd
_____ Probleme om aan die slaap te raak/aan die slaap te bly/onbevredigende slaappatroon
_____ Raak maklik moeg
_____ Probleme met konsentrasie of konsentrasie ‘n nul
_____ Spierspanning
- 8 Hoeveel meng bekommernis (“worry”) en fisiese simptome in met jou lewe, werk, sosiale aktiwiteite, familie ens.? Omkring ‘n nommer:

0	1	2	3	4	5	6	7	8
Geen		Ligtelik		Matig		Ernstig		Baie ernstig
- 9 Hoeveel word jy lastig geval deur bekommernis (“worry”) en fisiese simptome (hoeveel ongemak veroorsaak dit vir jou)? Omkring ‘n nommer:

0	1	2	3	4	5	6	7	8
Geen ongemak		Ligte ongemak		Matige ongemak		Ernstige ongemak		Baie ernstige ongemak

AFRIKAANS TRANSLATION OF THE PENN STATE WORRY QUESTIONNAIRE (PSWQ)

Dui asseblief aan tot watter mate die volgende stellings kenmerkend van jou is:

		Glad nie ken- merkend van my nie		Tot 'n mate ken- merkend van my		Baie kenmerkend van my
1	As ek nie genoeg tyd het om alles te doen nie, is ek nie bekommerd (worry) daaroor nie	1	2	3	4	5
2	My bekommernisse (worries) oorweldig my	1	2	3	4	5
3	Ek is nie geneig om bekommerd (worry) te wees oor dinge nie	1	2	3	4	5
4	Baie situasies maak my bekommerd (worry)	1	2	3	4	5
5	Ek weet ek moenie bekommerd (worry) wees oor dinge nie, maar ek kan nie daarvoor help nie	1	2	3	4	5
6	Wanneer ek onder druk is, bekommer (worry) ek myself baie	1	2	3	4	5
7	Ek is altyd bekommerd (worried) oor iets	1	2	3	4	5
8	Ek vind dit maklik om ontslae te raak van kwellende (worrisome) gedagtes	1	2	3	4	5
9	Sodra ek een taak voltooi het, begin ek bekommerd (worry) raak oor alles anders wat ek nog moet doen	1	2	3	4	5
10	Ek is nooit oor enigiets bekommerd (worried) nie	1	2	3	4	5
11	Wanneer daar niks meer is wat ek aan 'n kweiling kan doen nie, is ek nie meer bekommerd (worry) daaroor nie	1	2	3	4	5
12	Ek is my lewe lank 'n tobber/kwelgees (worrier)	1	2	3	4	5
13	Ek merk op dat ek bekommerd (worrying) is oor dinge	1	2	3	4	5
14	As ek eers begin om bekommerd (worry) te wees, dan kan ek nie ophou nie	1	2	3	4	5
15	Ek is altyd bekommerd (worry)	1	2	3	4	5
16	Ek is bekommerd (worry) oor projekte totdat alles voltooi is	1	2	3	4	5

AFRIKAANS TRANSLATION OF THE COGNITIVE AVOIDANCE QUESTIONNAIRE (CAQ)

Dui asseblief aan tot watter mate die volgende stellings kenmerkend van jou is:

		Glad nie ken- merkend van my nie	Effens ken- merkend van my	Tot 'n mate ken- merkend van my	Baie kenmerkend van my	Heeltemal ken- merkend van my
1	Daar is dinge waaraan ek eerder nie wil dink nie	1	2	3	4	5
2	Ek vermy sekere situasies wat my daartoe lei om aandag te gee aan dinge waaraan ek nie wil dink nie	1	2	3	4	5
3	Ek vervang bedreigende geestesbeelde (mental images) met dinge wat ek vir myself in my kop sê	1	2	3	4	5
4	Ek dink oor dinge wat my raak asof dit met iemand anders gebeur	1	2	3	4	5
5	Ek het gedagtes wat ek probeer vermy	1	2	3	4	5
6	Ek probeer om nie aan die mees ontstellende aspekte van sommige situasies te dink nie, want dit help my om nie te bang te wees nie	1	2	3	4	5
7	Ek vermy soms voorwerpe wat aanleiding kan gee tot ontstellende gedagtes	1	2	3	4	5
8	Ek lei my aandag af sodat ek dit vermy om aan sekere ontstellende onderwerpe te dink	1	2	3	4	5
9	Ek vermy mense wat my laat dink aan dinge waaraan ek nie wil dink nie	1	2	3	4	5
10	Ek doen gereeld dinge om my aandag van my gedagtes af te lei	1	2	3	4	5
11	Ek dink aan onbenullighede sodat ek nie hoef te dink aan belangrike onderwerpe wat my bekommer (worry) nie	1	2	3	4	5
12	Ek neem soms deel aan 'n aktiwiteit, net om nie aan sekere dinge te dink nie	1	2	3	4	5
13	Ek forseer myself om aan iets anders te dink, sodat ek dit vermy om aan onderwerpe te dink wat my ontstel	1	2	3	4	5
14	Daar is dinge waaraan ek probeer om nie te dink nie	1	2	3	4	5

		Glad nie ken- merkend van my nie	Effens ken- merkend van my	Tot 'n mate ken- merkend van my	Baie kenmerkend van my	Heeltemal ken- merkend van my
15	Ek hou aan om dinge vir myself in my kop te sê, net om dit te vermy om tonele ('n reeks geestesbeelde) wat my bang maak, te visualiseer	1	2	3	4	5
16	Ek vermy soms plekke wat my laat dink aan dinge wat ek verkies om nie aan te dink nie	1	2	3	4	5
17	Ek dink oor gebeure van die verlede, net om nie te dink aan toekomstige gebeure wat my onseker laat voel nie	1	2	3	4	5
18	Ek vermy aksies wat my herinner aan dinge waaraan ek nie wil dink nie	1	2	3	4	5
19	Wanneer ek geestesbeelde (mental images) het wat ontstellend is, sê ek vir myself dinge in my kop om die beelde te vervang	1	2	3	4	5
20	Ek dink oor baie onbenullige dinge, net om nie oor belangriker sake te dink nie	1	2	3	4	5
21	Ek hou myself soms besig, net om te voorkom dat gedagtes in my kop opspring	1	2	3	4	5
22	Ek vermy situasies waar mense, wat my aan onplesierige dinge laat dink, betrokke is	1	2	3	4	5
23	Ek probeer om gebeure te beskryf deur 'n interne monoloog (dinge wat ek vir myself in my kop sê), eerder as om beelde van ontstellende gebeure in my kop te vorm	1	2	3	4	5
24	Ek stoot die geestesbeelde (mental images) verwant aan 'n bedreigende situasie weg, deur te probeer om die situasie te beskryf deur middel van 'n interne monoloog	1	2	3	4	5
25	Ek dink eerder oor dinge wat ander mense bekommer (worry) as om oor my eie bekommernisse (worries) te dink	1	2	3	4	5

AFRIKAANS TRANSLATION OF THE INTOLERANCE OF UNCERTAINTY SCALE (IUS)

Jy sal hieronder 'n reeks stellings vind wat beskryf hoe mense mag reageer op onsekerhede in die lewe. Gebruik asseblief die ondergenoemde skaal om aan te dui tot watter mate elke item kenmerkend is van jou. Omkring asseblief 'n nommer (1 tot 5) wat jou die beste beskryf.

		Glad nie ken- merkend van my nie		Ietwat ken-merkend van my		Geheel en al ken- merkend van my
1	Onsekerheid weerhou my daarvan om 'n ferm opinie te hê	1	2	3	4	5
2	Om onseker te wees, beteken dat 'n persoon ongeorganiseerd is	1	2	3	4	5
3	Onsekerheid maak die lewe ondraaglik	1	2	3	4	5
4	Dit is onregverdig om geen waarborge in die lewe te hê nie	1	2	3	4	5
5	My kop ('mind') kan nie ontspan as ek nie weet wat môre gaan gebeur nie	1	2	3	4	5
6	Onsekerheid maak my ongemaklik, angstig of gespanne	1	2	3	4	5
7	Onvoorsiene gebeure ontstel my geweldig	1	2	3	4	5
8	Dit frustreer my om nie al die inligting te hê wat ek benodig nie	1	2	3	4	5
9	Onsekerheid weerhou my daarvan om 'n vol lewe te lei	1	2	3	4	5
10	Mens moet altyd vorentoe kyk, om verrassings te vermy	1	2	3	4	5
11	'n Klein onvoorsiene gebeurtenis kan alles bederf, selfs ten spyte van die beste beplanning	1	2	3	4	5
12	Wanneer dit tyd is om tot aksie oor te gaan, word ek deur onsekerheid verlam	1	2	3	4	5
13	Om onseker te wees, beteken dat ek nie eerste klas is nie	1	2	3	4	5
14	Wanneer ek onseker is, kan ek nie vooruit gaan nie	1	2	3	4	5
15	Ek funksioneer nie goed wanneer ek onseker is nie	1	2	3	4	5

		Glad nie ken- merkend van my nie		Ietwat ken-merkend van my		Geheel en al ken- merkend van my
16	Almal, behalwe ek, lyk altyd of hulle weet waarheen hulle met hulle lewens oppad is	1	2	3	4	5
17	Onsekerheid maak my kwesbaar, ongelukkig of hartseer	1	2	3	4	5
18	Ek wil altyd weet wat die toekoms vir my inhou	1	2	3	4	5
19	Ek hou niks daarvan om onkant gevang te word nie	1	2	3	4	5
20	Die kleinste mate van twyfel kan my keer om tot aksie oor te gaan	1	2	3	4	5
21	Ek behoort in staat te wees om alles vooruit te kan organiseer/beplan	1	2	3	4	5
22	Om onseker te wees beteken dat ek 'n tekort aan selfvertroue het	1	2	3	4	5
23	Ek dink dit is onregverdig dat ander mense seker oor hulle toekoms lyk	1	2	3	4	5
24	Onsekerheid weerhou my daarvan om rustig te slaap	1	2	3	4	5
25	Ek moet wegkom van alle onseker situasies	1	2	3	4	5
26	Die twyfelagtighede / duisterhede van die lewe maak my gespanne	1	2	3	4	5
27	Ek kan dit nie hanteer om besluiteloos oor my toekoms te wees nie	1	2	3	4	5

AFRIKAANS TRANSLATION OF THE META COGNITIONS QUESTIONNAIRE-30 (MCQ-30)

Hierdie vraelys handel oor oortuigings (menings) wat mense het oor hulle denke.

Hieronder volg 'n aantal oortuigings (menings) van mense. Lees asseblief elke item en dui aan hoeveel jy oor die algemeen daarmee saamstem, deur die toepaslike nommer te omkring.

Voltooi asseblief al die items, daar is geen regte of verkeerde antwoorde nie.

		Stem nie saam nie	Stem effens saam	Stem tot 'n mate saam	Stem heeltemal saam
1	Bekommernis ('worrying') help my om probleme in die toekoms te vermy	1	2	3	4
2	My bekommernis ('worrying') is gevaarlik vir my	1	2	3	4
3	Ek dink baie oor my gedagtes	1	2	3	4
4	Ek kan myself siek maak met bekommernis ('worrying')	1	2	3	4
5	Ek is bewus van hoe my kop werk wanneer ek 'n probleem deurdink	1	2	3	4
6	As ek nie beheer uitoefen oor 'n kommerwekkende gedagte nie, sal dit my skuld wees as dit gebeur	1	2	3	4
7	Dit is nodig om bekommerd ('worry') te wees, want dan bly ek georganiseerd	1	2	3	4
8	Ek het min vertroue in my geheue vir woorde en name	1	2	3	4
9	My kommerwekkende ('worrying') gedagtes hou aan, dit maak nie saak hoe ek probeer om dit te stop nie	1	2	3	4
10	Bekommernis ('worrying') help my om dinge in my kop uit te sorteer	1	2	3	4
11	Ek kan nie my kommerwekkende ('worrying') gedagtes ignoreer nie	1	2	3	4
12	Ek kontroleer ('monitor') my gedagtes	1	2	3	4
13	Ek behoort ten alle tye in beheer te wees van my gedagtes	1	2	3	4
14	My geheue kan my met tye mislei	1	2	3	4
15	My bekommernis ('worrying') kan veroorsaak dat ek mal word	1	2	3	4

		Stem nie saam nie	Stem effens saam	Stem tot 'n mate saam	Stem heeltemal saam
16	Ek is voortdurend/gedurig bewus van my gedagtes	1	2	3	4
17	Ek het 'n swak geheue	1	2	3	4
18	Ek gee baie aandag aan die manier waarop my kop werk	1	2	3	4
19	Bekommernis ('worrying') help my om dinge te hanteer ('cope')	1	2	3	4
20	Dit is 'n teken van 'n swakheid as ek nie my gedagtes kan beheer nie	1	2	3	4
21	Wanneer ek begin om bekommerd ('worrying') te wees, kan ek nie ophou nie	1	2	3	4
22	Ek sal gestraf word omdat ek nie beheer oor sekere gedagtes uitoefen nie	1	2	3	4
23	Bekommernis ('worrying') help my om probleme op te los	1	2	3	4
24	Ek het min vertroue in my geheue om plekke te onthou	1	2	3	4
25	Dit is sleg om sekere gedagtes te dink	1	2	3	4
26	Ek vertrou nie my geheue nie	1	2	3	4
27	As ek nie my gedagtes kon beheer nie, sou ek nie in staat wees het om te kan funksioneer nie	1	2	3	4
28	Om my werk goed te kan doen, is dit vir my nodig om bekommerd ('worried') te wees	1	2	3	4
29	Ek het min vertroue in my geheue vir handeling / verrigtinge	1	2	3	4
30	Ek ondersoek gedurig my gedagtes	1	2	3	4

AFRIKAANS TRANSLATION OF THE META-WORRY QUESTIONNAIRE (MWQ)

Hierdie vraelys assesser gedagtes en idees oor bekommernis (“worrying”). Hieronder is ‘n paar gedagtes gelys wat jy oor jou bekommernis (“worrying”) kan hê wanneer jy jouself sien bekommer (“worry”). Dui asseblief aan hoe dikwels elke gedagte voorkom deur die toepaslike nommer te omkring.

		Nooit	Soms	Dikwels	Amper altyd
1	Ek is besig om mal te raak van bekommernis (“worrying”)	1	2	3	4
2	My bekommernis (“worrying”) sal intensifiseer (toeneem) en ek sal ophou om te funksioneer	1	2	3	4
3	Ek maak myself siek met bekommernis (“worrying”)	1	2	3	4
4	My bekommernis (“worrying”) is abnormaal	1	2	3	4
5	My kop kan nie die bekommernis (“worrying”) vat nie	1	2	3	4
6	Ek mis uit op dinge in die lewe as gevolg van bekommernis (“worrying”)	1	2	3	4
7	My liggaam kan nie die bekommernis (“worrying”) vat nie	1	2	3	4

Wanneer jy jouself bekommer, tot hoe ‘n mate glo jy elkeen van hierdie gedagtes? Dui asseblief by elke item aan tot hoe ‘n mate jy die gedagte glo deur die toepaslike nommer langs elke stelling in te vul.

0 10 20 30 40 50 60 70 80 90 100

Ek glo glad nie hierdie gedagte nie *Ek is heeltemal oortuig daarvan dat hierdie gedagte waar is*

1	Ek is besig om mal te raak van bekommernis (“worrying”)	
2	My bekommernis (“worrying”) sal intensifiseer (toeneem) en ek sal ophou om te funksioneer	
3	Ek maak myself siek met bekommernis (“worrying”)	
4	My bekommernis (“worrying”) is abnormaal	
5	My kop kan nie die bekommernis (“worrying”) vat nie	
6	Ek mis uit op dinge in die lewe as gevolg van bekommernis (“worrying”)	
7	My liggaam kan nie die bekommernis (“worrying”) vat nie	

AFRIKAANS TRANSLATION OF THE NEGATIVE PROBLEM ORIENTATION QUESTIONNAIRE (NPOQ)

Mense reageer dikwels op verskillende maniere wanneer hulle probleme in hulle daaglikse lewe in die gesig staar (bv. gesondheidsprobleme, argumente, 'n tekort aan tyd ens.). Gebruik asseblief die skaal hieronder om aan te dui tot watter mate elk van die volgende items ooreenstem met die manier waarop jy optree of dink wanneer jy gekonfronteer word met 'n probleem. Omkring asseblief die nommer by elke item wat die beste met jou ooreenstem.

		Glad nie waar van my nie	Effens waar van my	Redelik waar van my	Baie waar van my	Besonder waar van my
1	Ek sien probleme as 'n bedreiging van my welstand	1	2	3	4	5
2	Ek twyfel dikwels aan my vermoë om probleme op te los	1	2	3	4	5
3	Ek vertel dikwels vir myself dat dit moeilik is om probleme op te los, selfs voordat ek eers probeer het om 'n oplossing te vind	1	2	3	4	5
4	My probleme lyk dikwels onoorkombaar	1	2	3	4	5
5	Wanneer ek probeer om 'n probleem op te los, bevraagteken ek dikwels my vermoë	1	2	3	4	5
6	Ek kry dikwels die indruk dat my probleme nie opgelos kan word nie	1	2	3	4	5
7	Selfs as ek dit regkry om sommige oplossings vir my probleme te vind, twyfel ek dat hulle maklik opgelos sal kan word	1	2	3	4	5
8	Ek is geneig om my probleme as 'n gevaar te sien	1	2	3	4	5
9	My eerste reaksie wanneer ek 'n probleem in die gesig staar is om my vermoë te bevraagteken	1	2	3	4	5
10	Ek sien dikwels my probleme as groter as wat dit in werklikheid is	1	2	3	4	5
11	Selfs al het ek van alle kante af na 'n probleem gekyk, wonder ek steeds of die oplossing waarop ek besluit het effektief sal wees	1	2	3	4	5
12	Ek beskou probleme as struikelblokke wat met my funksionering inmeng	1	2	3	4	5

AFRIKAANS TRANSLATION OF THE THOUGHT CONTROL QUESTIONNAIRE (TCQ)

Meeste mense ervaar onaangename, en/of ongewenste gedagtes, (in verbale en/of in prentjie vorm), wat moeilik kan wees om te beheer. Ons is geïnteresseerd in die tegnieke wat jy **oor die algemeen** gebruik om sulke gedagtes te beheer.

Hieronder is 'n aantal dinge wat mense doen om hierdie gedagtes te beheer. Lees asseblief elke stelling versigtig en dui aan hoe dikwels jy elke tegniek gebruik, deur die toepaslike nommer te **omkring**. Daar is geen regte of verkeerde antwoorde nie. Moenie te veel tyd spandeer om oor elke stelling te dink nie.

Wanneer ek 'n onaangename / ongewenste gedagte ervaar:

		Nooit	Soms	Dikwels	Amper altyd
1	Herroep ek eerder positiewe beelde	1	2	3	4
2	Vertel ek myself om nie so verspot te wees nie	1	2	3	4
3	Fokus ek op die gedagte	1	2	3	4
4	Vervang ek die gedagte met 'n meer alledaagse / onbeduidende slegte gedagte	1	2	3	4
5	Praat ek met niemand oor die gedagte nie	1	2	3	4
6	Straf ek myself vir die dink van die gedagte	1	2	3	4
7	Tob ek oor my bekommernisse ('worries')	1	2	3	4
8	Hou ek die gedagte vir myself	1	2	3	4
9	Hou ek my in plek daarvan met werk besig	1	2	3	4
10	Daag ek die geldigheid van die gedagtes uit	1	2	3	4
11	Raak ek kwaad vir myself vir die dink van die gedagte	1	2	3	4
12	Vermyn ek bespreking van die gedagte	1	2	3	4
13	Skreeu ek op myself vir die dink van die gedagte	1	2	3	4
14	Analiseer ek die gedagte rasioneel	1	2	3	4
15	Klap of knyp ek myself om die gedagte te stop	1	2	3	4
16	Dink ek aangename gedagtes in die plek daarvan	1	2	3	4

		Nooit	Soms	Dikwels	Amper altyd
17	Vind ek uit hoe my vriende hierdie gedagtes hanteer	1	2	3	4
18	Is ek meer bekommerd oor onbelangrike dinge	1	2	3	4
19	Doen ek iets wat ek geniet	1	2	3	4
20	Probeer ek om die gedagte te herinterpreteer	1	2	3	4
21	Dink ek oor iets anders	1	2	3	4
22	Dink ek meer oor die onbelangriker probleme wat ek het	1	2	3	4
23	Probeer ek om op 'n ander manier daarvoor te dink	1	2	3	4
24	Dink ek in plaas daarvan oor bekommernisse ('worries') van die verlede	1	2	3	4
25	Vra ek my vriende of hulle dieselfde gedagtes het	1	2	3	4
26	Fokus ek op verskillende negatiewe gedagtes	1	2	3	4
27	Bevraagteken ek die redes hoekom ek hierdie gedagte het	1	2	3	4
28	Vertel ek vir myself dat iets sleg sal gebeur as ek aan die gedagte dink	1	2	3	4
29	Praat ek met 'n vriend oor die gedagte	1	2	3	4
30	Hou ek myself besig	1	2	3	4

AFRIKAANS TRANSLATION OF THE WHY WORRY II QUESTIONNAIRE (WW-II)

Hieronder is 'n reeks stellings wat verband hou met bekommernis ("worry"). Dink asseblief terug aan tye toe jy bekommerd was, en dui aan tot watter mate elke stelling op toepassing is van jou, deur die toepaslike nommer te omkring.

		Glad nie waar nie	Effens waar	Tot 'n mate waar	Baie waar	Heeltemal waar
1	As ek myself nie bekommer ("worry") het nie, dan sou ek agterlosig en onverantwoordelik gewees het	1	2	3	4	5
2	As ek myself bekommer ("worry"), sal ek minder verontrus wees as onvoorsiene gebeure plaasvind	1	2	3	4	5
3	Ek bekommer ("worry") myself om te weet wat om te doen	1	2	3	4	5
4	As ek myself vooruit bekommer ("worry") oor dinge, sal ek minder teleurgesteld wees as iets ernstig gebeur	1	2	3	4	5
5	Die feit dat ek myself bekommer ("worry") help my om my optrede te beplan om 'n probleem op te los	1	2	3	4	5
6	Die handeling van bekommernis ("worry") self kan voorkom dat ongelukke gebeur	1	2	3	4	5
7	As ek myself nie bekommer ("worry") het nie, sou dit van my 'n nalatige / agterlosige persoon maak.	1	2	3	4	5
8	Dit is deur myself te bekommer ("worry") dat ek uiteindelik die werk wat ek moet doen, aanpak.	1	2	3	4	5
9	Ek bekommer ("worry") myself omdat ek dink dit kan my help om 'n oplossing vir my probleem te vind	1	2	3	4	5
10	Die feit dat ek myself bekommer ("worry") wys dat ek 'n mens is wat na my besigheid en sake omsien	1	2	3	4	5
11	Om te veel te dink aan positiewe dinge, kan voorkom dat dit gebeur	1	2	3	4	5
12	Die feit dat ek myself bekommer ("worry") bevestig dat ek 'n verstandige persoon is	1	2	3	4	5

		Glad nie waar nie	Effens waar	Tot 'n mate waar	Baie waar	Heeltemal waar
13	As 'n ongeluk oor my pad kom, sal ek minder verantwoordelik voel as ek myself voor die tyd daaroor bekommer ("worry") het	1	2	3	4	5
14	Deur myself te bekommer ("worry") kan ek 'n beter manier vind om dinge te doen	1	2	3	4	5
15	Bekommernis ("worrying") stimuleer my en maak my meer effektief	1	2	3	4	5
16	Die feit dat ek myself bekommer ("worry") spoor my aan om op te tree	1	2	3	4	5
17	Die handeling van bekommernis ("worrying") self verminder die risiko dat iets ernstig sal gebeur	1	2	3	4	5
18	Deur myself te bekommer ("worrying"), doen ek sekere dinge wat ek nie andersins sou doen nie	1	2	3	4	5
19	Die feit dat ek myself bekommer ("worry") motiveer my om die dinge wat ek moet doen te doen	1	2	3	4	5
20	My bekommernisse kan op hulle eie die risiko's van gevaar verminder	1	2	3	4	5
21	As ek myself minder bekommer ("worry"), verminder ek my kanse om die beste oplossing te kry	1	2	3	4	5
22	Die feit dat ek myself bekommer ("worry") sal my toelaat om minder skuldig te voel indien iets ernstig gebeur	1	2	3	4	5
23	As ek myself bekommer ("worry") sal ek minder ongelukkig wees wanneer 'n negatiewe gebeurtenis voorkom	1	2	3	4	5
24	Deur jouself nie te bekommer ("worry") nie, kan jy ongeluk aantrek	1	2	3	4	5
25	Die feit dat ek myself bekommer ("worry") wys dat ek 'n goeie persoon is	1	2	3	4	5

APPENDIX C

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20 November 2010

TO WHOM IT MAY CONCERN

**STATEMENT WITH REGARD TO LANGUAGE EDITING OF DOCTORAL
THESIS**

Hereby I, Jacob Daniël Theunis De Bruyn STEYL (I.D. 5702225041082), a language practitioner accredited with the South African Translators' Institute (SATI, confirm that I have language edited the following thesis:

Title of thesis: Cognitive processes in excessive worry: A cross-cultural investigation of three theories

Author: Ms Chrisma Pretorius

Yours sincerely



J.D.T.D. STEYL

PATran (SATI)

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