

**Behavioural Avoidance in Excessive Worriers:
Maintenance and treatment**

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ABSTRACT

This research examined the role of behavioural avoidance on excessive worry and applied a behavioural activation treatment to excessive worriers. The first study examined the latent construct of worry across adults from a university population (N: 536) with consideration of direct and indirect relationships with emotional distress, problem solving orientation, cognitive avoidance and behavioural avoidance. Path analysis from this model highlighted a central role for behavioural avoidance to facilitate distress in worry. Clinical implications for this study suggested that targeting behavioural avoidance in excessive worriers may benefit treatment outcome. In the second study, Behavioural Activation treatment was applied to seven excessive worriers. Treatment targeted behavioural avoidance e.g. procrastination, excessive checking of family members' safety, delay in checking exam results. Treatment strategies included functional analysis to break down avoidance patterns and ongoing activation of goal orientated behavioural steps. This seven- week group-based treatment intervention appeared to have transdiagnostic potential by producing reduced scores in excessive worry as well as depression and anxiety symptoms. 43% of participants demonstrated clinically significant change on the primary outcome of excessive worry and 57% no longer met criteria for GAD diagnosis at the end of treatment. The third study described a treatment trial of Behavioural Activation for Worry compared to a waitlist control. Treatment was delivered to 49 participants, in groups of six-eight individuals. Treatment sessions were extended to eight weeks. Twice as many individuals in the treatment group reported clinical significant reductions compared to the waitlist group at the end of the intervention. Significant improvements were also seen in life functioning and GAD symptoms. Results were maintained at four week follow-up. Regression results also demonstrated that reduction in behavioural avoidance was the best predictor of excessive worry four weeks after treatment completion, highlighting the key role of behavioural avoidance in the treatment of excessive worry.

STATEMENT OF CANDIDATE

I certify that the work in this thesis entitled *Behavioural Avoidance in Excessive Worriers: Maintenance and Treatment* has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree at any other university or institution other than Macquarie University.

I also certify that the thesis is an original piece of research and it has been written in its entirety by me. As the three studies in the paper (Chapters 2-4) are written in the form of manuscripts for publication, additional authors are appropriately acknowledged. In Study 1 (Chapter 2), co-authors Chen, J. and Rapee, R. M. were involved at a conceptualisation and supervisory level. Chen, J. was also responsible for the collecting of data from Flinders University. In Study 2 (Chapter 3), co-authors Chen, J. and Rapee, R. M. were involved at a conceptualisation and supervisory level. Chen, J. also assisted with co-therapy for one of the two treatment groups. Author J., Gaston was involved at a supervisory level only. In Study 3 (Chapter 4), co-authors Chen, J. and Rapee, R. M. were only involved at a supervisory level. Assistance provided for research work including data collection, data entry, analysis and co-facilitation of treatment groups are detailed in the Acknowledgement section on page 118.

In addition, I certify that all information sources and literature used are indicated in the thesis.

The research presented in this thesis was approved by Macquarie University Ethics Review Committee, reference number:

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CHAPTER ONE

GENERAL INTRODUCTION

Emotional disorders such as depression and anxiety have the highest prevalence of mental health problems in primary health care settings (Kessler et al., 2005; Zimmerman, McDermt, & Mattia, 2000). Occurring in about 20% of the population across the world, emotional disorders cause substantial disability and are set to become the largest cause of disease burden by 2020 in developed nations (World Health Organisation, 2001). Substantial co-morbidity rates across emotional disorders have serious implications for diagnosis, prioritisation of treatment intervention and treatment dissemination (Ehrenreich-May & Bilek, 2012; Kessler, et al., 2005). Emerging evidence of common latent processes across emotional disorders has supported clinical interest in transdiagnostic treatment protocols (Barlow, Allen, & Choate, 2004; Mansell, Harvey, Watkins, & Shafran, 2009; Wilamowska et al., 2010). Worry, a form of repetitive negative thinking, is an example of such a latent process seen across emotional disorders (Segerstrom, Tsao, Alden, & Craske, 2000; Watkins, 2008). Considering the common process of worry across emotional disorders, a unique opportunity is presented for worry to be targeted within a transdiagnostic treatment. Behavioural activation (BA) treatment has demonstrated considerable success with depressive rumination and shares adequate conceptual match to mechanisms of worry. BA is unique in its ability to tackle behavioural avoidance in excessive worriers. In conjunction with the parsimonious nature of the behavioural focused treatment, a transdiagnostic treatment approach using BA principles has significant practical and theoretical implications for public mental health services.

Support for transdiagnostic treatment

A transdiagnostic treatment typically targets common features that produce symptoms in related classes of disorders, such as mood and anxiety disorders (Ehrenreich-May & Bilek, 2012). McEvoy et al (2009) reports that emphasis of transdiagnostic treatment is typically on functional links between components of the transdiagnostic formulation (e.g. cognitions, behaviours, emotions and physiology). While individualised case formulation is the bedrock of evidence-based treatment (Persons & Tompkins, 2007), transdiagnostic approaches

capitalise on the commonalities across individual formulations for emotional disorders (Clark & Taylor, 2009). Specifically, this entails the common elements in individuals that lead them to develop emotional disorders and the functional relationships that appear to maintain them (McEvoy, et al., 2009).

Research on evidence-based treatment of psychological disorders is currently dominated by a proliferation of disorder-specific protocols (Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010). This approach has contributed to the understanding and treatment of various psychological disorders (Clark & Fairburn, 1997). However, this approach is often criticised for neglecting to acknowledge parallel findings from other psychological disorders (Harvey, Watkins, Mansell, & Shafran, 2004), as well as issues of shared features across disorders (Clark & Taylor, 2009). For example, there are currently more than 15 published manuals that consider panic disorder as an isolated disorder, thereby disregarding the numerous other emotional and anxiety disorders that regularly occur concurrently (Wilamowska, et al., 2010). The complexity of these protocols and the sheer volume of treatments available become a barrier to the dissemination of evidence-based treatments (Barlow, Levitt, & Bufka, 1999) in clinical practice.

High levels of co-morbidity in individual presentations provides a strong case for the treatment of multiple disorders concurrently in a unified protocol (Harvey, et al., 2004). Evidence of common processes across disorders supports the case for developing effective evidence-based treatment protocols which target these core processes rather than disorder-specific symptoms. By targeting processes and not disorder specific symptoms, transdiagnostic approaches provide a single set of therapeutic principles across multiple disorders (Ellard, et al., 2010). In doing so, there is also a greater propensity to treat both principal and co-occurring diagnoses (Farchione et al., 2012). A review of treatment outcome studies by McEvoy and colleagues (2009) showed that individuals who received transdiagnostic treatment interventions demonstrated improvements across co-morbid

disorders and comparable results with disorder-specific treatments. Considering the pragmatic benefits in treatment dissemination and training of mental health professionals, this treatment approach presents a cost-effective means of providing mental health services in public health settings (Mansell, et al., 2009).

Co-occurrence of emotional disorders

While emotional disorders such as anxiety and mood disorders cause significant impairment and distress on their own, these detrimental effects are exponential when the disorders are experienced concurrently (Ehrenreich-May & Bilek, 2012). In primary health care settings, clients referred for psychological treatment often have complex and co-morbid presentations (Kessler, et al., 2005). In a large study conducted by Brown and colleagues (2001), it was found that 55% of patients who had been diagnosed with a principal anxiety or mood disorder experienced at least one additional anxiety or mood disorder at the time of assessment, and 76% had an additional disorder in their lifetime. Such high levels of co-morbidity in emotional disorders has led to great interest in the common processes which bridge these disorders (Watkins, 2008), as well as treatment interventions which are able to tackle multiple disorders concurrently (Harvey, et al., 2004). Clinical studies have long found that by targeting treatment to one disorder, it is not unusual that additional disorders also show improvement (Wilamowska, et al., 2010). In one particular study, Borkovec and colleagues (1995) found that symptoms of co-morbid emotional disorders were significantly reduced in individuals who received effective treatment specifically targeting Generalised Anxiety Disorder. However, little is known of the mechanisms which explain how treatment of one condition leads to the reduction of other non-targeted co-morbid disorders (Brown, Antony, & Barlow, 1995).

One explanation for the high co-occurrence of mood and anxiety disorders is that they may develop from the same underlying predisposition (Barlow, 2002). An explanation put

forward by the DSM-5 working group suggests that commonly co-occurring disorders such as depression and anxiety may be independent disorders linked by common pathogenic pathways which express shared symptoms (DSM-5 Workgroup, 2007). A latent variable of repetitive negative thought bridges across emotional disorders, such as depression and anxiety disorders (Watkins, 2008) Worry, an example of this repetitive negative thought process, is found across emotional disorders and has a conceptual overlap with a key mechanism which drives anxiety and depression (Mansell, et al., 2009; Segerstrom, et al., 2000).

Worry: a common process across emotional disorders

Excessive and uncontrollable worry is the central feature of Generalised Anxiety Disorder (GAD; American Psychiatric Association, 1994). Worry is defined as a predominantly verbal-based thought activity whose function appears to be a cognitive attempt to solve the problems of possible future danger (Borkovec, Alcaine, & Behar, 2004). However, recent research has found that a large proportion of individuals who experience excessive levels of worry do not meet criteria for GAD (Ruscio & Borkovec, 2004). Worry is also associated with all anxiety disorders (Brosschot, Gerin, & Thayer, 2006) and depression (Borkovec, Ray, & Joachim, 1998; McLaughlin, Borkovec, & Sibrava, 2007). Further Brown and colleagues (Brown, Antony, & Barlow, 1992) found that sufferers of a variety of anxiety disorders including panic disorder, social phobia and obsessive compulsive disorder reported much higher scores of excessive worry than non-clinical populations. All in all, the tendency to worry is seen as a potential risk factor for the development of anxiety and probably depressive disorders (Nestadt et al., 2001).

Research investigating worry in emotional disorders has led to an understanding that worry is a process that is similar to rumination (McLaughlin, et al., 2007; Segerstrom, et al., 2000; Watkins, 2008). Rumination is described as a negative thinking process that passively focuses on one's depressive symptoms and the implication of these symptoms (Nolen-

Hoeksema, 1998). Worry and rumination share a common function to enable avoidance (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; McLaughlin, et al., 2007) and are responsible for the generation of negative affect in emotional disorders. These processes allow individuals to blunt the distress of emotional experience but over the long term, they prevent emotional processing necessary for the extinction of fear responses and general deployment of coping resources (Borkovec, et al., 2004; Borkovec, et al., 1998).

What is worry?

Similar to avoidant behaviour present in phobias, worry can be strengthened and maintained through negative reinforcement (Borkovec, et al., 1998). The worry process suppresses somatic activation, which provides initial relief but consequently interferes with emotional processing and thus maintains the anxious meaning (Borkovec & Roemer, 1995). Worry is further reinforced by positive beliefs that worry is helpful for problem solving. When negative future events do not occur (due to avoidance of aversive stimuli), these positive beliefs are further reinforced.

For most individuals worry is a common and ordinary occurrence. Thinking about future events, particularly in relation to stressful and challenging events, is both adaptive and helpful (Behar, DiMarco, Hekler, Mohlman, & Staples, 2009). Early research into worrying first came about through examination of test anxiety. These studies demonstrate that the focus of attention on inner cognitive events and possible feared events is the greatest predictor of poor test performance (see Deffenbacher, 1980 for discussion). Performance is impaired in a number of ways. Participants who report higher levels of worrying tend to experience greater levels of intrusive negative thoughts (Borkovec, Robinson, Pruzinsky, & Depree, 1983) and more difficulty in dealing with ambiguity when compared to non-worriers (Metzger, Miller, Cohen, Sofka, & Borkovec, 1990). While every individual will worry to some degree, “pathological worry is distinguished from normal worry when it becomes chronic, excessive,

uncontrollable and essentially removes joy from a person's life" (p108; Borkovec, et al., 1998).

Worry processes and avoidance

Whilst excessive worriers don't differ on problem solving ability per se, they tend to have reduced problem solving confidence and orientation. When worriers attempt problem solving, a constant mental rehearsal of the threatening outcome or threat scenario is activated, causing poor problem solving confidence (Matthews, 1990) and reluctance to orientate towards problem resolution (D'Zurilla & Nezu, 1990). High level worriers believe that worry is useful because it helps prevent negative outcomes from occurring, including avoiding disappointment and preventing catastrophe (Freeston, Rheame, Letarte, Dugas & Ladouceur, 1994). During the decision making process, worriers tend to require a greater level of evidence on which to base a decision, resulting in a greater delay in decision-making compared to non-worriers (Szabo & Lovibond, 2002; Tallis, Eysenck, & Matthews, 1991). Worriers also tend to lack confidence in their own solutions, often leading to procrastination and delay (Metzger, et al., 1990; Stober & Joormann, 2001). The avoidance of anxiety provoking stimuli and difficulty implementing solutions further aggravates and maintains their distress and anxiety (Hong, 2007).

Treatment for excessive worry

In terms of disorders, worry is most strongly linked with GAD (Borkovec, et al., 2004). Cognitive Behavioural Therapy (CBT) for the treatment of GAD has demonstrated considerable success despite its short treatment history compared to other anxiety disorders (Barlow & Di Nardo, 1991). In a meta-analysis conducted by Covic and colleagues (2008), CBT was found to be an effective treatment for adults with GAD. They found particularly high effect size changes for a primary outcome variable of excessive worry compared to composite anxiety variables. These gains were also maintained at one year follow-up. As with

many diagnosis-specific treatments, several models of CBT treatments exist for GAD. The two models which yielded the strongest effect sizes in the Covin study were treatments based on Borkovec's (1994) and Dugas' and colleagues (1997) theoretical models of GAD.

Borkovec's avoidance model (Borkovec, 1994; 2004) theorises that worry is predominantly a thought-based activity that inhibits vivid mental imagery and associated somatic and emotional activation. As an enhancement of emotional activation is required for the extinction of fear, treatment typically requires individuals to be exposed to the feared stimuli as well as the meaning behind the fear (Foa & Kozak, 1986). Hence worry is often seen as an ineffective cognitive attempt to problem solve, an attempt to remove a perceived threat (Behar, et al., 2009). Treatment using this model would typically involve response prevention by postponing worry to a set time in the day, relaxation strategies to encourage present-moment focus of attention, imaginal exposure to facilitate the acquisition of coping responses and cognitive challenging to identify and target core fears (Behar & Borkovec, 2005).

Subsequent to the development of Borkovec's model, other CBT treatment models of GAD have been developed in an attempt to expand the scope of earlier formulations (Behar, et al., 2009). The intolerance of uncertainty model centres around the idea that individuals with excessive worry are far more intolerant of uncertainties inherent in daily life, compared to normal controls (Dugas, Gagnon, Ladouceur, & Freeston, 1998). As result of this intolerance, excessive worriers are more likely to see problems as threats to be avoided rather than a challenge to be met (Ladouceur et al., 2000). Key features of this treatment target education about intolerance of uncertainty, evaluation or worry beliefs, and processing of core fears. A further role of the treatment is to assist individuals to acquire a more positive orientation to problem situations. (Ladouceur, Blais, Freeston, & Dugas, 1998).

There is a broad range of limitations with both Borkovec and Dugas' treatment models. Despite considerable success of existing CBT treatment for GAD in the last two decades, up to 50% of afflicted individuals do not return to normal degrees of anxiety (Borkovec, 2002). These diagnostic-specific treatments are often lengthy (mean of 10 sessions; Gould, Otto, Pollack, & Yap, 1997), costly, and require a great deal of clinical expertise (Borkovec, 2002; Jacobson, Martell, & Dimidjian, 2001). Further, the abstract nature of cognitive challenging in traditional CBT is hard to comprehend for individuals with limited language ability, intellectual disabilities and poor psychological mindedness (Willner, 2006). Furthermore, the emphasis on cognitive interventions has resulted from an assumption that excessive worriers do not experience behavioural avoidance as a symptomatic feature and traditional exposure techniques have little relevance (Borkovec, et al., 2004). A body of research have emerged in recent years that not only provide evidence of behavioural avoidance in excessive worriers, but also provide support for possible improvements in treatment outcome when targeting behavioural avoidance. This will be explored in greater depth in the following section.

Behavioural avoidance and worry

Current treatment interventions for excessive worry and GAD have focused largely on strategies which target cognitive avoidance (Beesdo-Baum et al., 2012). However, there has been increasing clinical support for the treatment of overt behavioural avoidant symptoms in excessive worriers. Contrary to Borkovec's comments regarding the lack of behavioural symptoms in excessive worriers, Hazlett-Stevens (2008) suggests that it is the diffuse nature of anxiety in excessive worriers which renders specific avoidance behaviours difficult to identify for sufferers and clinicians alike. Clinical studies have shown that worriers engage in subtle behavioural strategies that aim to reduce or prevent discomfort in the short term. However, these strategies consequently serve to maintain excessive worrying in the longer term (Andrews, Crino, Hunt, Lampe, & Page, 1994; Hazlett-Stevens, 2008; Wells, 1999).

Behavioural avoidance in excessive worriers is likely to manifest itself through avoiding worrisome situations (e.g. promotions, dating) and information (e.g. reading the newspaper, collecting bills) or through decision making (Beesdo-Baum, et al., 2012). Others may seek reassurance from others to reduce their perception of threat or uncertainty (e.g. calling family members repeatedly to check on safety). Findings have also emerged that excessive worriers also engage in checking behaviours similar to what is seen in obsessive compulsive disorder (Coleman, Pietrefesa, Holaway, Coles, & Heimberg, 2011). This checking behaviour is used much like worrying, as a preventative behaviour to reduce the likelihood of negative events to occur (Beesdo-Baum, et al., 2012). These forms of subtle behavioural symptoms often undermine treatment efforts by strengthening perceptions of threat (Hazlett-Stevens, 2008).

Wells' metacognitive model of GAD (1999) remains one of the only treatment models of GAD which formally acknowledges the role of behavioural avoidance in the maintenance of worry symptoms. Stimulated by positive beliefs about the worry and avoidant strategies, the function of worry is a means to cope with threat. Hence worriers are likely to engage in both cognitive and behavioural strategies intended to avert the need to worry in the first place (Wells & Carter, 2001). Owing to the limited study in this area, there remains a gap in research which examines the efficacy between cognitive and behavioural treatments for anxiety disorders.

Despite the emerging evidence of behavioural symptoms, behavioural avoidance continues to be on the sidelines in terms of traditional evidence-based treatment of GAD. GAD is the only anxiety disorder which does not feature any form of behavioural symptoms in its diagnostic criteria (American Psychiatric Association, 1994). In a proposition for changes to the GAD criteria in the DSM-5, Andrews and colleagues (2010) suggested several behavioural criteria including “marked avoidance of potential negative events, marked procrastination in behaviour or decision making due to worries, and repeatedly seeking reassurance due to worries” (p142). It is also proposed that greater recognition of behavioural

symptoms in GAD may facilitate improved diagnosis and more effective treatment (Beesdo-Baum, et al., 2012).

Behavioural Activation treatment

The Behavioural Activation model highlights the centrality of patterns of behavioural avoidance and withdrawal (e.g. reduced social interactions, reduced activity or avoiding confrontation). Heavily influenced by the behavioural traditions of Beck (1976), Ferster (1973) and Lewinsohn (1974), the modern interpretation of Behavioural Activation for the Treatment of Depression (BATD) emphasises the central importance of the context of an individual's life and ways in which the individual responds to these contexts that trigger and maintain depression (see Dimidjian, Barrera, Martell, Munoz, & Lewinsohn, 2011 for discussion). The model conceptualises that depression may be initially triggered by a change in life circumstances which renders the individual's environment less rewarding. This leads to feelings of sadness and depression. When this occurs, the routine of the depressed individual is disrupted as they withdraw from possibly rewarding activities. Avoidance of these positive reinforcers minimises distress in the short term but causes long term difficulty as the individual loses confidence or skill or negative circumstances become more urgent. The BATD approach argues that simply increasing activity (such as in pleasant activity scheduling) is not enough. Informed by an individual functional analysis of behavioural avoidance patterns, activation strategies need to be individualised, broken down into achievable units and consistent with the individual's long term goals.

BATD has demonstrated success in several randomised control trials (Dimidjian et al., 2006; Hopko et al., 2011) and has also shown to work individually and in group treatment (Houghton, Curran, & Saxon, 2008). Sturmey (2009) has also conducted a systematic review comparing BATD with Cognitive Behavioural Therapy (CBT) and Cognitive Therapy (CT)

for depression and found similar effect sizes both post-treatment and in follow-up sessions. However, dropout rates in BATD were shown to be lower compared to CBT and CT.

To date, only a handful of research studies have applied BA with individuals who experience anxiety disorders. Chu and colleagues (2009) delivered BA treatment in a group format to high school students who were diagnosed with co-morbid depression and anxiety. The results were clinically significant for 75% of the pilot study group. In a separate study with three older adults, the clients also benefitted from a modified application of BA for anxiety (Turner & Leach, 2010). The individuals reported decreased scores in anxiety measures post-treatment and in a three-month follow-up. The results of these BA treatments on depression and anxiety disorders demonstrate a promising opportunity to extend BA transdiagnostically across emotional disorders.

How would Behavioural Activation treatment target worry?

Previous studies provide insight into how BA could interact with the mechanisms of worry. Behavioural Activation for Worry treatment has several components that may comprise active ingredients and these are likely to work together. Chu and colleagues (2009) concluded that BA is effective in breaking down anxious avoidant responses through gradual exposure to feared stimuli, which subsequently reduces associated stress. Increases to active goal-oriented behaviours are also likely to result in response-contingent positive reinforcement which could consequently lead to greater engagement in activities that have anxiolytic functions (p374; Turner & Leach, 2010). Further, the use of a BA-style functional analysis to break down patterns of avoidance and withdrawal allows the individual to develop activation strategies which target areas of avoidance that are maintaining their anxiety. This may include implementing assertiveness training for someone who persistently worries about workplace conflict or response prevention steps for someone who worries and checks on their family member obsessively.

Exposure strategies consistent with learning theories are also one of the components in BAW. The applications of BA are also consistent with learning theories commonly used in exposure therapy. Prolonged and repeated exposure to conditioned aversive stimuli is a typical component of anxiety treatment (Rachman & Hodgson, 1980). In the case of BA for Worry (BAW), ongoing activation of goal oriented behavioural steps creates opportunities for repeated exposure towards otherwise anxiety provoking stimuli. These principles are rarely used with excessive worriers due to the diffused nature of their worry topics (Borkovec, et al., 1998), however clinical support for targeting subtle behavioural avoidance strategies suggests that there is value in developing this approach further (Beesdo-Baum, et al., 2012).

Consistent with the intolerance of uncertainty model targeting excessive worry in GAD, activating behaviour may also serve to reduce the intolerance through gradual exposure towards activities that are likely to provoke anxiety (Dugas, Buhr, & Ladouceur, 2004). Guided gradual engagement with anxiety provoking issues are likely to correct and reduce the level of intolerance for uncertain outcomes of perceived problems. Subsequently, it is anticipated that encouraging re-engagement and reducing avoidance style problem orientation will enhance problem resolution and discontinue the maintenance of the anxiety (Chu, et al., 2009).

Behavioural Activation for Worry: Clinical implications

The application of BA for Worry (BAW) suggested in this thesis presents an innovative behavioural focused treatment for excessive worry that is theoretically grounded to address the function of behavioural avoidance. Although CBT for the treatment of excessive worry has yielded promising results, there is a need to further enhance the efficacy of evidence-based interventions (Behar, et al., 2009; Covin, et al., 2008). Considering the clinical evidence of behavioural avoidance among excessive worriers, the development of a

treatment targeting these symptoms may provide a greater understanding of the role in which behavioural avoidance may serve to maintain or exacerbate worry symptoms.

BAW presents several pragmatic benefits in addition to the capacity to treat multiple emotional disorders concurrently. Clinicians and researchers suggest that the success of BA is because of its simple and concrete treatment algorithms which are easier to teach (Dimidjian, et al., 2006; Hollon, 2001). Comparing BATD with the full package of CBT with a group of depressed participants, Jacobson (1996) demonstrated that behavioural activation was equally effective as the full packaged CBT. If behavioural interventions are comparable to the full package CBT, behavioural interventions may be preferable as they are simpler to deliver and therefore may be delivered more economically with less training required. This argument was extended further by Ekers and colleagues (2011) who engaged mental health nurses with no previous therapy experience to deliver BA treatment to a group of severely depressed patients who attended a university research clinic. Results from both studies supports Jacobson and colleagues' (2001) argument that BA is a parsimonious treatment more amenable to dissemination, even if the therapist is less experienced.

Summary and purpose of this thesis

As stated previously, aetiological studies demonstrate high co-morbidity across emotional disorders such as depression and anxiety. The proliferation of disorder-specific treatment approaches hamper efforts of widespread dissemination and training of mental health professionals. In light of these clinical issues, transdiagnostic treatment interventions which target common processes across multiple disorders are receiving growing support. Considering the evidence of worry as a common process prevalent across emotional disorders, this process presents a unique and suitable target for an integrated treatment approach.

A suitable transdiagnostic intervention requires a strong conceptual similarity across the multiple emotional disorders (Chu, et al., 2009). Its treatment strategies must also be flexible to allow applications to diverse problems. Behavioural Activation (BA) treatment has demonstrated considerable success in targeting the repetitive negative thinking process of rumination in depression (Dimidjian, et al., 2006). As a process with strong conceptual match with worry, BA is a logical candidate for treatment with emotional disorders (Chu, et al., 2009; Turner & Leach, 2010). BA strategies are also relatively simple to teach which greatly benefits training of mental health professionals (Ekers, et al., 2011).

Traditional CBT treatment of excessive and chronic levels of worry has focused largely on cognitive avoidance (Behar, et al., 2009). Furthermore, recent clinical evidence has demonstrated that worriers demonstrate significant levels of behavioural avoidance, which is largely unaccounted for in traditional conceptual models of worry (Beesdo-Baum, et al., 2012). Considering the evidence, further exploration of the role of behavioural avoidance in the maintenance of worry is required to fill the treatment and knowledge gap. Due to the applied nature of BA strategies, Behavioural Activation for Worry (BAW) also has pragmatic benefits within a public health framework, including ease of training and dissemination. When this is considered together with the transdiagnostic nature of targeting worry, there are considerable clinical implications for the treatment of emotional disorders.

The research described in the current thesis has three broad aims. First, to evaluate a theoretically-driven model of worry and identify factors which contribute to worry and the processes in which they serve to maintain distress and impairment. Drawing together evidence from theoretical and clinical studies of worry, the theoretical model examines factors such as problem solving orientation, cognitive and behavioural avoidance. Particular interest is paid to the role of behavioural avoidance due to the knowledge gap in this area. This first study is reported in Chapter two. Following evidence of the potential causal role of behavioural avoidance in the maintenance of distress in worriers, the second aim is to pilot the

application of Behavioural Activation treatment (Jacobson, et al., 2001) to target behavioural avoidance with 7 individuals who experience excessive worry. BAW is presented as a possible transdiagnostic treatment targeting the common variable of worry, but addressing emotional disorder symptomatology and dysfunction. This study is reported in Chapter three. Following success of the pilot, the third and final study describes a randomised control trial of BAW in which active treatment is compared with a waitlist control group at three time points. This study is presented in Chapter four,

The findings of these three studies are presented in three independent papers prepared for publication. As result, there is unavoidable overlap and repetition, especially in the background literatures.

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CHAPTER TWO

A MODEL OF EXCESSIVE WORRY:

MAPPING THE ROLES OF COGNITIVE AND BEHAVIOURAL AVOIDANCE

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Abstract

Researchers have focused extensively on the role of cognitive avoidance in the maintenance of distress and impairment among individuals experiencing chronic and excessive levels of worry, but behavioural avoidance has received relatively little attention. This study tested a model of excessive worry incorporating relationships between cognitive avoidance, behavioural avoidance, perceived problem solving and emotional distress. 536 participants from two universities in Sydney and Adelaide Australia completed measures of cognitive and behavioural avoidance, problem solving, depressive and anxious symptomatology. Path analysis supported the proposed model supporting a central role for behavioural avoidance in facilitating distress among worriers. Clinical implications from this study suggest that future treatment of excessive worry may benefit from greater emphasis on behavioural avoidance.

Introduction

Uncontrollable and excessive worry is a core feature of Generalised Anxiety Disorder (GAD; American Psychiatric Association, 1994). However, recent research has found that a large proportion of individuals who do not meet criteria for GAD may also experience the same severity of worry (Ruscio & Borkovec, 2004). Worry, defined as a chain of thoughts and images typically focused on possible negative consequences (Borkovec, et al., 1983), has also shown to be associated with other anxiety disorders (Brosschot, et al., 2006) as well as depression (Borkovec, et al., 1998; McLaughlin, et al., 2007). It has been considered one of the most prevalent symptoms of psychological disturbance (Stanley & Gibson, 1985). As Hong (2007) comments, worry is an “influential cognitive vulnerability factor that accounts for unique variance in both anxious and depressive symptoms” (p. 286). This sentiment, reflecting worry as an influential component of both anxiety and depression, suggests that a better understanding of the characteristics of worry will have broad implications for the management of internalising distress.

Treatment of worry, largely informed by treatments for GAD, has focused on cognitive avoidance as the key component in cognitive-behavioural models of excessive worry (Dugas, et al., 1998). However, clinicians have increasingly noted other constructs, which may play a role in the mediation of impairment and distress for worriers. Laboratory studies have found that poorer problem solving confidence and orientation have led chronic worriers to exacerbated levels of depression and anxiety (Hong, 2007). Further, clinical evidence has identified the importance of addressing behavioural avoidance in the form of safety behaviours in order to effectively treat excessive worrying in GAD (Hazlett-Stevens, 2008). Together, these results raise intriguing questions about the relationship between worry, avoidance and problem solving and present fertile ground to explore the role each of these constructs may play in facilitating symptoms of anxiety and depression.

Well established models of GAD which describe the aetiology and maintenance of worry commonly focus on worry as a cognitive phenomenon (Borkovec, et al., 1998; Dugas, et al., 1998). In particular, worry is seen as a negatively valenced “chain of thoughts and images” (p 10; Borkovec, et al., 1983) whose function is the cognitive avoidance of threat. This model argues that cognitive avoidance plays a key role in maintaining worry by preventing opportunities to desensitise to worry-provoking stimuli (Borkovec, et al., 1998). Evidence for this function of worry has been found in a number of laboratory studies which demonstrated that chronic or state worry was associated with reduced autonomic variability and linked with decreased parasympathetic activity in the short term (Thayer, Friedman, & Borkovec, 1996). Given this hypothesised function, treatment has primarily targeted cognitive avoidance as the key maintaining factor in GAD (Dugas, et al., 1998).

Another construct of interest that has been linked to the maintenance of distress in worriers is problem solving. Interestingly, research suggests that chronic worriers are not necessarily characterised by poorer problem solving skills. Rather, it appears to be low confidence in problem solving and poor perceived control over outcomes that cause procrastination and delay engagement in possible solutions (Davey, 1994). Chronic worriers tend to engage in constant mental rehearsal (worrying) of the threatening outcome or threat scenario (Matthews, 1990). In particular, they require a greater level of evidence during decision making, resulting in a greater delay in making a decision compared to non-worriers (Szabo & Lovibond, 2002; Tallis, et al., 1991). For example, in a community sample comparing high level worriers with low level worriers, participants were asked to complete a computerised decision making task (Tallis, et al., 1991). While there was no difference in the general reaction time, the response time increased for high level worriers when the evidence required to make decisions was removed. Persistent worrying about possible future catastrophes also limits the individual from taking steps towards their desired outcome

(Borkovec, Hazlett-Stevens, & Diaz, 1999). As a result, distressing situations without resolution further exacerbate and maintain depressed and anxious moods (Hong, 2007).

Traditional treatment for GAD has focused primarily on cognitive avoidance strategies (Roemer & Orsillo, 2002) due to the common conceptualisation of worry as a purely cognitive process and mental phenomenon (Borkovec, et al., 1998). However, there has been increasing interest in the role of avoidance behaviours in the maintenance of worry and the exacerbation of anxiety and depressive symptoms (Hazlett-Stevens, 2008). One of the clearer arguments for the presence of avoidance behaviour in GAD comes from Wells' (1999) meta-cognitive model of GAD where subtle forms of behavioural avoidance may arise as result of excessive worry. For instance, individuals who fear the loss of loved ones may continuously check on their safety or individuals who worry persistently about making mistakes may over prepare for exams. Few studies have investigated the presence of behavioural avoidance in individuals with GAD. Craske and colleagues examined worry monitoring records of individuals diagnosed with GAD and found that over half (52.6%) reported avoidance behaviours (Craske, Rapee, Jackel, & Barlow, 1989). Clinical treatment of GAD also recognises the importance of addressing safety behaviours ranging from subtle safety behaviours to overt avoidance of situations that provoke anxiety (Hazlett-Stevens, 2008). However a theoretical model that explores how behavioural avoidance might maintain worry and subsequent distress has yet to be explored.

Taken together, we hypothesize a strong link between problem solving confidence, avoidance and worry. When faced with problems, worriers tend to see the problem as a threat (low perceived problem-solving). Avoiding (inactive behaviours) the problem can create or exacerbate new problems secondary to the decreased activity which in turn lead to further distress about the problem (Hong, 2007). In Figure 1 we present a hypothesised model in which worry predicts distress equally through each of the mediating variables of behavioural avoidance, cognitive avoidance and perceived problem solving. Based on theoretical and

empirical evidence (Borkovec, et al., 1998; Davey, 1994; Hazlett-Stevens, 2008), we predict that worry works through all three mechanisms. Particular attention is paid to behavioural avoidance due to the limited knowledge available regarding its function in worry and as such, paths in the hypothesized model are in the direction towards behavioural avoidance. Examination of the variables contributing to worry underlying anxiety and depressive symptoms should provide valuable information to develop a better clinical and theoretical understanding of worry and its consequences. Moreover, research into treating multiple disorders by focusing on core mechanisms has been discussed by several authors (Barlow, et al., 2004; Mansell, et al., 2009). This study may have implications for future transdiagnostic treatment approaches which target underlying core processes of a broad-spectrum of mental health disorders including depression and anxiety disorders (Clark & Taylor, 2009) where excessive worry is a maintaining factor.

Method

Participants

A total of 534 undergraduate students studying psychology at Macquarie University (Sydney: 57.3%) and Flinders University (Adelaide: 42.7%) participated in the study. The sample was predominantly female (80.9%) with a mean age of 29.3 years ($SD=9.1$ years). 73.8% of participants were Anglo-Australian with 11.6% of South East Asian descent, 6% of European descent, and 5.1% of Middle Eastern descent.

Measures

The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990)

This is a 16-item measure assessing an individual's disposition to worry, including its breadth, frequency and intensity. The PSWQ is one of the most widely used questionnaires to measure pathological worry in both clinical and non-clinical populations. Brown, Antony, &

Barlow (1992) demonstrated that the items have strong internal consistency (Cronbach's $\alpha = 0.93$) and reported a unifactorial structure using a sample of anxiety disordered patients. The internal consistency in the current study was very good ($\alpha = .92$)

The Social Problem Solving Inventory- Revised Short Form (SPSI-R:S; D'Zurilla, Nezu, & Maydeu-Olivares, 2002)

This is a 25-item measure used to assess theoretical components linked to an individual's perceived problem-solving i.e. problem orientation and problem solving styles (D'Zurilla, et al., 2002). The questionnaire contains five component scales measuring - Positive Problem Orientation (PPO), Negative Problem Orientation (NPO), Rational Problem Solving (RPS), Impulsivity/Carelessness Style (ICS), Avoidance Style (AS). Participants rate each question on a 5 point Likert scale and scoring can either be based on individual scales or a total score can be obtained through a sum of PPO, RPS and reverse scoring of NPO, ICS and AS.

The short form used in the current study has demonstrated good psychometric properties including adequate internal consistency ($\alpha = .79-.83$), and good test-retest reliability at three weeks ($r = .74$). It also demonstrated adequate predictive, convergent, and discriminant validity (D'Zurilla, et al., 2002). The internal consistency in the current study was adequate, ranging from $\alpha = .77$ to $.80$ for subscales and $.71$ for the SPSI-R:S overall.

The short form version of the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995)

This is a 21-item self-report questionnaire designed to measure the severity of symptoms on three factors of depression, anxiety and stress. The depression scale includes items that measure symptoms typically associated with dysphoric mood (e.g. sadness or hopelessness), the Anxiety scale includes items related to symptoms of physical arousal (e.g.

panic, increased heart rate), and the Stress scale includes items related to symptoms of emotional distress or tension (e.g. irritability or overreaction to events). Participants indicate the extent to which they experienced symptoms during the previous week on a 4 point Likert type scale between 0 (did not apply to me at all) and 3 (Applied to me very much or most of the time). The three factors in the DASS 21 demonstrated good convergent and discriminant validity and high internal consistency in both clinical and non-clinical populations (Henry & Crawford, 2005; Lovibond & Lovibond, 1995) and across multiple ethnic groups (Norton, 2007). In the current study, the three scales were combined to create a general dimension of psychological distress. The validity of a combined scale was demonstrated by Henry and Crawford (2005) with excellent internal consistency for the overall scale ($\alpha=.93$). This was comparable with the value for the current sample ($\alpha=.96$).

The Cognitive-Behavioural Avoidance Scale (CBAS; Ottenbreit & Dobson, 2004)

This is a 31-item multidimensional measure of avoidance. The four factors, derived from factor analysis, include behavioural-social (e.g. “I find that I often want to leave social gatherings”), behavioural-nonsocial (e.g. “I avoid trying new activities that hold the potential for failure”), cognitive-social (e.g. “I try not to think about problems in my social relationships”) and cognitive-nonsocial (e.g. “I try not to think about my future”). Factor analysis of the CBAS demonstrated four factors - behaviour social, behaviour non-social, cognitive social and cognitive non-social – which accounted for 44.95% of the variance in item responses (Ottenbreit & Dobson, 2004). High correlations between subscales were demonstrated ($r=0.75-0.86$) suggesting that a composite avoidance score may be used and a coefficient alpha of 0.91 was obtained with the overall scale score. In the current study, the four factors in the CBAS were grouped to measure the two constructs of cognitive and behavioural avoidance. The factors were logically grouped to reflect behavioural avoidance – behaviour social and behaviour non-social; and cognitive avoidance - cognitive social and

cognitive non-social. Good internal consistencies were found for the two factors in the current study: $\alpha=.93$ for cognitive avoidance and $\alpha=.94$ for behavioural avoidance.

The CBAS has been found to be positively correlated with a range of self-report avoidance measures and negatively with a measure of active approaching. Three week test-retest reliability of the total scale was reported to be 0.92 reflecting high stability (Ottenbreit & Dobson, 2004).

Procedures

Participants were recruited from undergraduate psychology students at Macquarie University and Flinders University. Details of the study ('Worry and Problem solving styles') were advertised on the Psychology Participant Pool websites. Participants interested in the study were able to sign up for the research and were provided a link to an online survey which took approximately 20 minutes to complete. Items were presented one page at a time and participants were not able to skip questions. Upon completion, they were awarded course credits for their participation. Macquarie University participants were also invited to enter a draw to win one of two, \$200 dollar shopping vouchers as an incentive for their participation. The study was approved by the Human Research Ethics Committees of Macquarie University and Flinders University. All participants provided consent to participate.

Results

Descriptive statistics

Descriptive statistics for the variables are presented in Table 1. The distributions of all 7 indicators were acceptable in terms of skewness (range -.30 to .86) and kurtosis (range -.71 to .35). On average participants reported moderate levels of depression and stress, and severe levels of anxiety (Lovibond & Lovibond, 1995). Levels of worry were also higher than

generally found for non-clinical groups (Fresco, Heimberg, Mennin, & Turk, 2002; Meyer, et al., 1990).

Table 1. *Descriptive statistics for measures of interest*

Indicator	Mean	SD	Skew	Kurtosis	Range
Worry	54.41	13.21	-.17	-.71	62.00
Problem solving	11.35	2.24	-.30	-.09	12.50
Cognitive avoidance	17.59	7.09	.83	.21	34.00
Behavioural avoidance	15.27	6.52	.86	.03	28.00
Distress					
Depression	19.81	12.10	.56	.23	56
Anxiety	17.20	10.49	.54	.35	56
Stress	24.28	11.51	.23	-.29	56

Bivariate relationships

Bivariate Pearson correlations were calculated between each pair of measures. Data is presented in Table 2.

Table 2. *Bivariate relationships among model indicators*

	Worry	Problem solving	Cognitive avoidance	Behavioural avoidance	Distress
Worry	-	-	-	-	-
Problem solving	-.28	-	-	-	-
Cognitive avoidance	.27	-.64	-	-	-
Behavioural avoidance	.37	-.51	.81	-	-
Distress	.44	-.31	.43	.49	-

Note: All p 's < .001

Model testing

Path analysis was used to examine the hypothesised relationships between variables and to test direct and indirect relationships. Analysis of Moment Structures (AMOS) version 19 was used to conduct model testing. AMOS provides a conservative test of the hypothesised model as conducting regressions on each separate relationship would not account for the variance demonstrated by the other relationships. Relevant standardised regression weights were examined and both direct and indirect paths were estimated. The overall fit of models were examined based on a number of commonly used goodness of fit indices: the relative fit index (RFI; Bollen, 1986), the incremental fit index (IFI; Bollen, 1989), the Tucker-Lewis index (TLI; Tucker & Lewis, 1973) and the comparative fit index (CFI; Bentler, 1990). Values of the RFI, IFI, TLI and CFI range from zero to one and values of 0.95 or more indicate acceptable fit. To account for model complexity, the root mean square error of approximation (RMSEA; Steiger, 1990) was also examined, along with its 90% confidence interval (Browne & Cudeck, 1993). With regards to the RMSEA, values of 0.06 or less have been suggested to indicate acceptable fit (Hu & Bentler, 1999). Where the overall model fit was inadequate, modifications were made to improve the overall fit by removing non-significant paths. As a final step, M plus (Muthén & Muthén, 1998-2010) was used to estimate the significance of each relevant set of indirect paths.

Prediction of the relationships between variables

The first model (shown in Figure 1) explored the paths predicting the degree of distress associated to worry through direct and indirect relationships via perceived problem solving, cognitive avoidance and behavioural avoidance. In order for the analysis to be conducted, a hypothesized model with 1 less path than a saturated model was tested. As seen in Table 3, the original model provided a good fit for the data. However, the regression weights for the paths between Problem Solving and Distress; Cognitive Avoidance and

Distress were not significant ($\beta=-.01, p=.92$; $\beta=.11, p=.10$ respectively). Hence these paths were removed to improve the parsimony of the model. All significant paths ($p<.01$) were included in the model. A final model (shown in Figure 2) was tested and provided an excellent fit to the data with all individual paths significant (all p 's $<.01$). Total proportion of variance in distress accounted for by the variables was 32%.

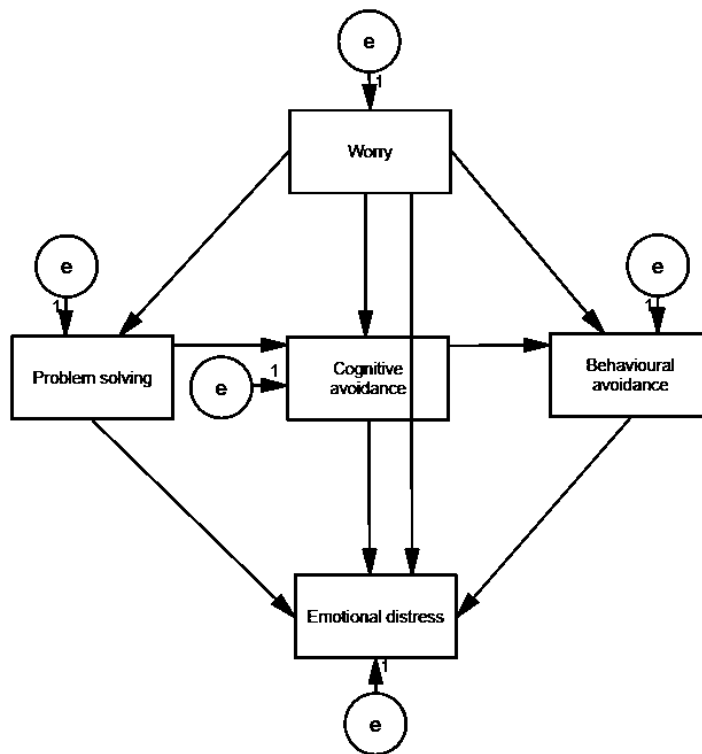


Figure 1. Model 1: Hypothesised model.

Table 3. *Goodness of Fit Indices*

	χ^2/df	CFI	TLI	RFI	IFI	RMSEA	RMSEA (90% CI)
Model 1	1.96	1.00	.99	.98	1.00	.04	.00-.13
Model 2	1.82	1.00	.99	.98	1.00	.04	.00-.09

Path analysis using M Plus software demonstrated that all indirect paths in the final model were significant. The indirect effect of problem solving on emotional distress via cognitive and behavioural avoidance was highly significant ($p < .001$, $\beta = -.18$, $z = -8.64$), as was the indirect path of cognitive avoidance on emotional distress via behavioural avoidance ($p < .001$, $\beta = .29$, $z = 9.86$). The indirect influence of worry on behavioural avoidance, via cognitive avoidance and perceived problem solving was significant ($p < .01$, $\beta = .28$, $z = 5.18$), as was the indirect path between worry and emotional distress via behavioural avoidance ($p < .01$, $\beta = .064$, $z = 5.71$). Finally, the path between worry and distress via behavioural avoidance was also highly significant ($p < .01$, $\beta = .064$, $z = 5.71$).

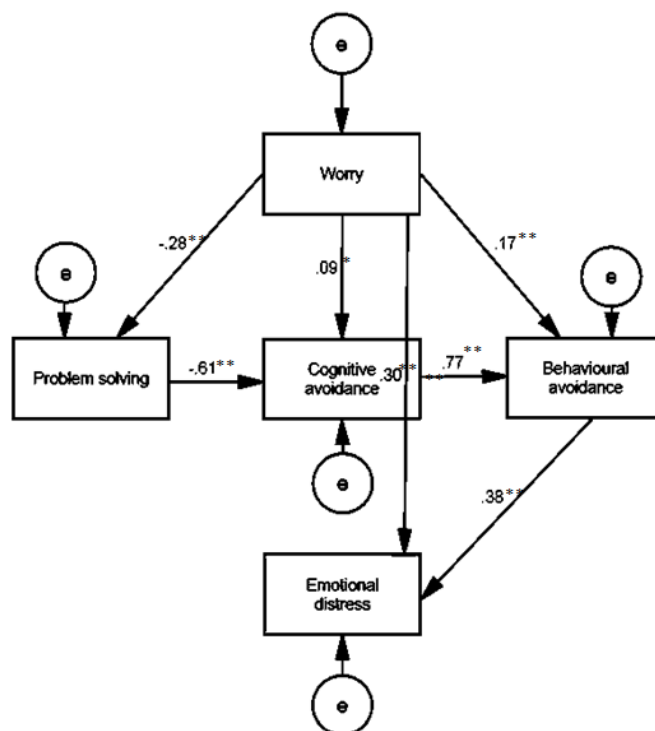


Figure 2. Model 2: Final modified model.

Note: $** = p < .001$; $* = p < .1$

Discussion

This study examined a model of worry that combines the conceptualisation of worry as both an ineffective attempt to solve problems and a method of emotional avoidance. Our results showed that while worry is directly related to emotional distress, it also describes additional variance in distress through its relationships with other factors including perceived problem solving i.e. problem solving confidence, cognitive and behavioural avoidance. Specifically, a central role for behavioural avoidance in facilitating distress was highlighted in the final model. A direct link between worry and emotional distress was also found indicating that some of the variance in distress predicted by worry is not associated with any of the above factors.

Previous research into problem solving suggests that excessive worriers do not lack problem solving skills per se but rather lack problem solving confidence, which in turn exacerbates and maintains high levels of emotional distress and impairment (Hong, 2007). In other words, while worriers are able to generate effective solutions to problems, it is their perceived problem solving ability and the lack of confidence in their own solutions which prevents problem resolution (Szabo & Lovibond, 2002). The current study identified an indirect link between worry and perceived problem solving, suggesting that reduced problem solving confidence predicts distress partly when worriers avoid thinking about the difficulty or avoid behavioural resolution of the difficulty. However, given the reliance on self-report measures in the current study, we were not able to specify whether this relationship reflects actual problem solving deficits. While previous studies have demonstrated a relationship between problem solving skills and excessive worry using both self-report measures and problem solving tasks (Ladouceur, et al., 1998; Tallis, et al., 1991), future studies will benefit from clarifying whether it is perceived problem solving or actual problem solving skills that are relevant to the distress experienced by worriers.

The current findings suggest that behavioural avoidance is not simply a result of excessive worry, but may in fact have an important role in exacerbating and maintaining the distress associated with worrying. Behavioural avoidance has long been discussed as a response to threat and anxiety in CBT treatment of anxiety disorders (Beck, 1976; Clark, 1986). Commonly termed safety behaviours, they serve a powerful role in amplifying or maintaining crucial threat appraisals. Behavioural interventions for excessive worry have sometimes been ignored by clinicians due to the common perception that the anxiety is broad and diffuse, sometimes referred to as ‘free floating’ (Borkovec & Roemer, 1995). However, clinical references to behavioural avoidance or safety behaviours can be found across treatment manuals and clinical guides (Andrews, et al., 1994; Hazlett-Stevens, 2008). Subtle in nature, avoidance behaviours in individuals with GAD can include aspects such as avoidance of stimuli which act as reminders of their fears e.g. reading newspapers, talking to certain people (Andrews, et al., 1994), reassurance seeking or checking behaviours. Such strategies inevitably serve to “maintain preoccupation with worry and prevent exposure to situations which may otherwise prove that worry is harmless and controllable” (p 531; Wells, 1999) and consequently exacerbated levels of emotional distress are maintained. The current model provides empirical support for these suggestions by demonstrating the central role that behavioural avoidance might play in facilitating distress. In the final model, both problem solving confidence and cognitive avoidance had indirect relationships with emotional distress through their relationship with behavioural avoidance. Given the overwhelming support for worry as a primarily cognitive process (Borkovec, et al., 2004; Dugas, et al., 1998), this study provides an important demonstration that behavioural avoidance may act as an intermediary between the cognitive process of worry and the resulting distress. One may expect this finding to stimulate new treatment development efforts for worry-based disorders.

There are a number of considerable limitations to this study. Firstly, the research was cross-sectional and therefore conclusions regarding causality and directions of effect cannot

be drawn. Whilst we had chosen the directional paths due to our interest in behavioural avoidance, several other directional models might have been hypothesised with similar plausibility. It is also possible that other factors not assessed in this study are equally or even more important in mediating the relationships. Future studies would benefit from employing longitudinal designs in order to more carefully determine the direction of relationships between variables (Cole & Maxwell, 2003). Secondly, the model was tested using a homogenous university student population who are completing studies in psychology. Even though the current data demonstrated levels of anxiety and worry much higher than non-clinical norms (Fresco, Heimberg, et al., 2002; Meyer, et al., 1990), researchers have long warned against extrapolating empirical findings from a student population based on self-report measures to evaluate the discrete phenomena of psychopathology (Gotlib, 1984; Nezu, Nezu, & A., 1986). In order for the data to be generalizable, replication with clinical populations would be beneficial.

Finally, the reliance on a self-reporting instrument to measure avoidance and problem solving may be influenced by reporting bias and social desirability (Feldman, 1993; Tanaka-Matsumi & Kameoka, 1986). The combination of behavioural and cognitive constructs in the current study complicates the use of alternative behavioural or other-reported measures. While behavioural tasks may be used to measure the level of behavioural avoidance or problem solving confidence, cognitive avoidance reflects a covert event that cannot be observed by others (Ottenbreit & Dobson, 2004). A methodology which allows clinicians to measure problem elaborations with anxious individuals has been proposed as a valid non-self-reported measure of cognitive avoidance (Stober & Borkovec, 2002). Future research will benefit from using a range of behavioural and cognitive tasks in addition to generalising the research to a broader clinical population.

While keeping these limitations in mind, the present study provided preliminary support for a conceptual model of worry. In particular, the model pointed to aspects of worry

that might provide important targets for treatment. Given that worry is a core component of several forms of psychopathology, it presents as a unique vehicle for the development of a transdiagnostic treatment approach to emotional disorders such as depression and anxiety. Until recently, traditional evidence based psychological treatments have emerged from disorder specific approaches where treatment models are developed to account for the onset and maintenance of specific disorders (Mansell, et al., 2009). An emerging body of research has demonstrated an alternative treatment approach by targeting cognitive and behavioural processes that are shared across a range of psychological disorders (Watkins, 2008). There are also further pragmatic benefits to providing assessment and intervention that target key maintaining processes (Mansell, et al., 2009). In addition to the rationale of shared processes, there is also the recognition that many clients referred for psychological treatment have complex and co-morbid presentations (Kessler, et al., 2005) whereby a high proportion of individuals diagnosed with an emotional disorder have additional anxiety or mood disorders (Brown, et al., 2001). In summary, the findings from the current study further bolster the promise of transdiagnostic treatment approaches and suggest that focussing on reducing behavioural avoidance may prove to be a valuable avenue.

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CHAPTER THREE

CAN BEHAVIOURAL ACTIVATION REDUCE WORRY?

A PILOT STUDY

Submitted for publication to Journal: Cognitive and Behavioural Practice.

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Abstract

Excessive worry is a common feature across anxiety disorders and depression. Given this core role, worry presents itself as an ideal target for transdiagnostic intervention for emotional disorders. Over the last decade Behavioural Activation (BA) has found success in addressing avoidance and withdrawal in depression. When applied to the mechanism of worry, BA treatment breaks down avoidance behaviours (e.g. procrastination, rumination) and improves problem orientation by increasing active behaviours. This paper describes a pilot study of Behavioural Activation for Worry (BAW) involving a group treatment with seven adults whose main complaint was excessive worry and had raw scores of 55 or higher on the Penn State Worry Questionnaire. Participants also received a diagnosis of Generalised Anxiety Disorder. Preliminary results showed that at the end of the seven week treatment, 43% of participants demonstrated clinically significant change and 57% no longer met GAD diagnoses. Our findings suggest that BAW is a feasible treatment for excessive worry and is able to accommodate participants with a range of emotional disorders.

Introduction

Clinical interventions have traditionally been confined to diagnostic specific treatment models. However, high co-morbidity rates, particularly in the case of emotional disorders (Kessler, et al., 2005), have called for a rethink of traditional disorder-based approaches. For example, in a large clinical study conducted across three university outpatient clinics, 55% of patients who had a principal diagnosis of anxiety or mood disorder experienced at least one additional anxiety or mood disorder at the time of assessment, and 76% had an additional disorder in their lifetime (Brown, et al., 2001). With this in mind, there are important pragmatic and theoretical benefits to providing unified treatments for emotional disorders (Barlow, et al., 2004).

Assessments and interventions that target key maintaining processes across disorders are seen as pragmatic and viable alternative treatment options (Mansell, et al., 2009). Excessive worry is one such process that is highly prevalent across emotional disorders (Stanley & Gibson, 1985). Studies of Generalized Anxiety Disorder (GAD) have revealed a wealth of information about the function and consequences of excessive worry. Widely regarded as the central defining characteristic of GAD (American Psychiatric Association, 1994), uncontrollable and excessive worry is considered an avoidant coping strategy which enables individuals to suppress somatic and emotional processing of fear (Borkovec, et al., 2004). Excessive worry is not only central to GAD but is also associated with other anxiety disorders (Brosschot, et al., 2006) as well as depression (Borkovec, et al., 1998). Laboratory studies have also demonstrated that induction of worry will elicit both anxiety and depression in comparable degrees (Andrews & Borkovec, 1988). Given this broad relevance, worry presents itself as an ideal target for transdiagnostic intervention for emotional disorders such as depression and anxiety. To our knowledge, there is currently no existing transdiagnostic program for excessive worry for this purpose.

In order to be successful in targeting the process of worry, transdiagnostic treatment approaches must demonstrate success in targeting other disorders with similar underlying mechanisms (Chu, et al., 2009). Having demonstrated considerable success in treating rumination in depression, Behavioural Activation (BA) is one such plausible treatment (Dimidjian, et al., 2011; Jacobson, et al., 2001). The Behavioural Activation model is rooted in the behavioural therapy tradition established by Ferster (1973) and Lewinsohn (1974), with heavy emphasis on patterns of avoidance and withdrawal. Recent research has pointed to strong similarities between the features of worry and those of rumination – one of the key predictors of severity and chronicity in depression (Lyubomirsky & Nolen-Hoeksema, 1995). Watkins (2008) suggests that worry and rumination are examples of shared processes known as thinking bridges which are “repetitive, prolonged and recurrent thoughts about one’s self and one’s concerns” (p. 163).

Worry and rumination appear to share a functional role in enabling avoidance (Fresco, Frankel, et al., 2002). Both these processes serve a function which allows individuals to blunt the distress of emotional experience in the short term but over the long term, “inhibit emotional processing and the ability to deploy adaptive coping resources” (p. 187). As emotional processing is a necessary precursor to fear extinction, this avoidance response is ultimately responsible for the maintenance of emotional distress (Borkovec, et al., 2004; Borkovec, et al., 1998). Within the BA framework, rumination is conceptualized as an “escape behaviour, that keeps the individual separated from others and prevents true problem solving” (p. 121; Martell, Addis, & Jacobson, 2001). Although rumination is a less obvious form of avoidance compared to activities such as social withdrawal, it provides a similar function in avoiding active engagement with one’s environment (Moulds, Kandris, Starr, & Wong, 2007).

Behavioural Activation (BA) treatment has gathered a strong following in research and clinical settings for its ability to address avoidance in depression (Dimidjian, et al., 2006;

Hopko, Lejuez, Lepage, Hopko, & McNeil, 2003). The BA model works by highlighting the pattern of avoidance and withdrawal to encourage individuals to re-engage in opportunities where there are natural reinforcers of mood and confidence. In depression, BA is effective in reducing rumination, and enhancing motivation and engagement in instrumental behaviours towards problem solving (Jacobson et al., 1996). Randomized treatment trials have demonstrated that among individuals diagnosed with severe depression, BA was comparable to antidepressant medication in symptom improvement and significantly outperformed cognitive therapy (Dimidjian, et al., 2006). A systematic review conducted by Sturme (2009) revealed that BA for depression demonstrated similar effect sizes at post-treatment and follow-up, as well as lower drop-out rates compared to cognitive therapy and cognitive behavioural therapy (the standard treatment for depression).

When applied to the mechanism of worry, BA is also expected to break down anxious behaviours through the extinction of fear by repeated exposure (Chu, et al., 2009). Fear extinction through gradual exposure towards anxiety provoking situations is known to be an effective form of treatment for anxiety disorders such as social phobia and panic disorder (Bouton, Mineka, & Barlow, 2001). Until recently, theoretical studies have focused primarily on cognitive avoidance as a key component of excessive worry (Dugas, et al., 1998). However, clinical evidence has identified the critical role that behavioural avoidance plays in maintaining worry (Hazlett-Stevens, 2008). Commonly known as safety behaviours, gross and subtle forms of behavioural avoidance can be found among most worriers (Craske, et al., 1989). These may range from overtly avoiding situations which provoke worry to over-preparation when worried about an exam performance. In a study conducted with over 500 university students, preliminary supporting evidence highlighted the critical role which behavioural avoidance plays in maintaining distress in excessive worriers (Liu, et al, under review). Results from this study suggest that behavioural avoidance is not simply a

consequence of excessive worry, but may potentially play a causal role in exacerbating distress for worriers.

While reduction of safety behaviours has been addressed in clinical treatment of GAD (Andrews, et al., 1994), few treatment models of excessive worry have specifically targeted behavioural avoidance. One of the key components of BA for anxiety involves a functional analysis to derive specific behavioural patterns (Chu, et al., 2009). The participant is then assisted to generate goal orientated alternative behaviours to avoidant responses towards sources of worry. Participants are guided to try out these ‘approach behaviours’ (Chu, et al., 2009) as a means to breaking the worry cycle. In doing so, it is expected that their fear extinction is also likely to generalise over time as they experience success using behavioural activation to tackle their worrying.

BA for Worry (BAW) uniquely addresses this link between worry and behavioural avoidance. BA is likely to impact on the characteristic of worriers to engage in a mental loop in persistently generating all possible outcomes without acting on resolution (Davey, Startup, MacDonald, Jenkins, & Paterson, 2004). By targeting behaviour interruption, BA is likely to impact on excessive worrying through a guided activation approach to situations that are anxiety provoking. Over time the individual is likely to experience increased positive reinforcement in their environment either by resolving difficulties or improving the overall quality of their life.

An additional mechanism through which BAW may work to reduce worry is by reducing intolerance of uncertainty. An intolerance of uncertainty refers to a difficulty in tolerating and accepting uncertainty, leading to an excessive requirement for evidence before acting on problem solving (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). This cognitive bias is said to be one of the key factors in the development and maintenance of pathological worry and GAD (Dugas, Marchand, & Ladouceur, 2005). Activating behaviour

may serve to reduce the intolerance of uncertainty by guiding participants to engage in acting on an alternative solution regardless of their uncertainty about whether it is the 'perfect solution' (Dugas, et al., 1997). Although participants are taught problem solving strategies to work out the most favourable alternative action, they are also guided to tolerate making mistakes and continue to try other alternatives when their efforts fail to resolve their difficulties (Leahy, 2002).

To our knowledge, only a handful of studies have applied BA to anxiety. Single case samples have included older adults experiencing mixed anxiety disorders (Turner & Leach, 2010) and a single adult diagnosed with anxiety and a chronic medical condition (Hopko, Lejuez, & Hopko, 2004). The study which best described the application of BA treatment as a transdiagnostic treatment for emotional disorders was reported by Chu and colleagues (2009). In this study, treatment was delivered to five adolescents using a modified group based BA protocol including an exposure component, to address anxiety related problems. At the end of treatment, two out of five participants reported clinically significant improvements to both depressive and anxious symptoms. A handful of studies have also applied BA to individuals experiencing mixed Posttraumatic Stress Disorder (Mulick & Naugle, 2004; Jakupak, et al., 2006). Whilst these studies all feature limited sample size and moderate-large effect gain, they demonstrate that effective BA treatment can be delivered for a mixed anxiety and depression presentation within a short time frame in both individual and group formats. The current study aims to extend these findings by evaluating the effectiveness of an adapted Behavioural Activation for Worry (BAW) based on a BA treatment manual for depression developed by Addis and Martell (2004). It is expected that after completion of the BAW intervention, participants will experience reduced excessive worry as well as depressive and anxious symptomatology.

Method

Participants

Participants self-referred to the study as a result of advertising posted around the Macquarie University campus, Sydney, Australia, for a free treatment study on excessive worry. Inclusion in the study required participants to be adults (18-65 years) who worried excessively and uncontrollably about a range of topics and had raw scores of 55 or higher on the Penn State Worry Questionnaire (PSWQ; Meyer, et al., 1990) (i.e. within 1 standard deviation of GAD means; Gillis, Haaga, & Ford, 1995). Exclusion criteria included significant current suicidal ideation, active psychosis, alcohol or drug dependency and current treatment for anxiety or depression. Use of antidepressant medication was not an exclusion criterion if use had begun before treatment and maintained on a stable dosage throughout the study. The psychological treatment protocol used in this study was reviewed and approved by the Macquarie University Human Research Ethics Committee and all participants gave written informed consent for participation in the study.

21 potential participants contacted the program via email and telephone over a period of 3 months of participant recruitment. Three did not meet inclusion criteria (primary presenting problem was not excessive worry) and eight chose not to continue with the assessment process (uncontactable or no longer interested in seeking treatment). Ten participants who met criteria for the study were invited to complete a face to face structured diagnostic interview - Anxiety Disorders Interview Schedule IV (Brown, Di Nardo, & Barlow, 1994). The ADIS IV provided diagnostic information on co-morbidity. A post ADIS IV assessment was not conducted at post treatment. During the interview, two more participants were excluded due to active suicidal ideation and primary presenting problem was not excessive worry, which were not revealed during the paper based assessment questionnaires. One participant dropped out prior to the first session citing work

commitments. In total, seven participants took part in two separate groups with four and three participants in each group. Participants completed a minimum of five of seven weekly sessions and were included in the study as treatment completers. Several of the participants missed out on sessions due to work/study commitments. The participants were full-time students, aged 19 to 31 (mean=23.1 years; SD=4.1 years).

All seven participants met full diagnostic criteria for GAD, four also met criteria for comorbid social phobia, two for comorbid dysthymia and one for comorbid Obsessive Compulsive Disorder (OCD) at pre-treatment. One participant presented with antidepressant medication (SSRI) use (Participant 6). All but one of the participants (Participant 4) had sought mental health services prior to commencing the treatment program but all had concluded therapy at the time of treatment Table 1 summarises the demographic characteristics of the participants.

Assessment measures

The following are assessment and self-rating scales used in the present study. All the self-report measures were completed at two time points: pre-treatment and one week following treatment.

Anxiety Disorders Interview Schedule for DSM-IV Adult version (Brown, et al., 1994)

The ADIS IV was conducted by a registered psychologist familiar with treatment and assessment of anxiety disorders. The ADIS IV is a semi-structured interview that assesses for current periods of Axis I diagnoses with a focus on anxiety disorders. Upon completion of the interview, clinicians assign a clinical severity rating (CSR) out of 8, where ratings of 4 or higher reflect a clinical diagnosis. The ADIS interviewer was trained to reliability standards by observing three interviews conducted by an experienced interviewer then conducting at least three interviews under observation. The CSR for each participant was discussed in

supervision with the Clinical Director of the Centre for Emotional Health, Macquarie University. Good to excellent inter-rater reliability has been demonstrated with kappa coefficients ranging from .67 to .86 for the various anxiety disorders (Di Nardo, Brown, & Barlow, 1994) and kappa = .67 for GAD (Brown, et al., 2001).

Clinical outcome measures

Penn State Worry Questionnaire (PSWQ; Meyer, et al., 1990)

One of the most widely used questionnaires for pathological worry, the PSWQ has 16 items that measure trait worry as well as the general excessiveness and uncontrollable characteristics of pathological worry. The PSWQ is unifactorial and has shown high internal consistency with samples consisting of anxiety disorder patients (Brown, et al., 1992) as well as community populations (Olatunji, Schottenbauer, Rodriguez, Glass, & Arnkoff, 2007). Cronbach's alphas range from .86 to .93 for anxiety disorder patients and from .87 to .95 for community populations. Test-retest reliability is excellent ($r = .93$) and convergent validity is high when compared to other measures of worry and anxiety (Meyer, et al., 1990).

The Depression Anxiety and Stress Scales Short Form (DASS-21; Lovibond & Lovibond, 1995)

The DASS-21 is a 21 item self-report scale designed to measure the negative emotional states of depression, anxiety and stress. Symptoms experienced in the previous week are indicated using a 4 point Likert scale, where the depression scale measures symptoms including dysphoria, lack of interest, inertia and hopelessness. The anxiety scale assesses symptoms typical of physical arousal including panic or increased heart rate. The stress scale is sensitive to levels of chronic non-specific arousal typically associated with GAD such as difficulties relaxing, muscle tension and agitation (Brown, Chorpita, Korotitsch, & Barlow, 1996). Total scores on each subscale range from 0 to 21, with high scores

indicating greater symptomatology. Cut-off points are 10, 14, 21 and 28 for mild, moderate, severe and extremely severe levels of depression. Cut-off points for the anxiety subscale are 8, 10, 15 and 20. Whereas cut-off points for stress subscale are 15, 19, 26 and 34. High internal consistency is demonstrated in both clinical and non-clinical populations (Henry & Crawford, 2005; Lovibond & Lovibond, 1995) with $\alpha = .88$ for depression scale, .82 for anxiety, .90 for stress and .93 for the total scale (Lovibond & Lovibond, 1995).

Generalized Anxiety Disorder Questionnaire (GAD Q; Roemer, Borkovec, Posa, & Borkovec, 1995)

The GAD-Q is a self-report measure of GAD symptomatology based on DSM-III diagnostic criteria. Roemer and colleagues (1995) have described a scoring system, based on criteria consistent with DSM-III-R a) experiencing excessive, uncontrollable and/or unrealistic worry, b) being bothered by worriers more days than not over the past 6 months, c) worrying about two or more topics, d) often experiencing six or more of the 18 associated symptoms in the past 6 months, and e) worry interfering with their daily lives by a “moderate” or greater degree. Participants are categorised as GAD when they meet criteria a), b) and d). Using an undergraduate sample (Roemer, et al., 1995), it was found that the GAD-Q had 80% agreement with diagnoses of GAD based on the ADIS-R (Di Nardo & Barlow, 1988).

The scoring criteria for the GAD-Q proposed by (Roemer, et al., 1995) was used to delineate GAD status including: excessive and uncontrollable worry, be bothered by worry on more days than not in the last 6 months and experience 6 or more associated symptoms including restlessness, irritability and muscle tension.

Life Interference Scale (LIS)

The Life Interference Scale is a 6 item measure that assesses the impact of an individual's worrying on various components of their life including work, family and leisure activities. Participants use 9 point Likert scales that are summed to provide a total interference scale (0 = no interference, 48 = extreme interference). Analysis conducted using a clinical sample (Rapee, Abbott, Baille, & Gaston, 2007) has demonstrated that the LIS has excellent internal consistency ($\alpha = .90$) and correlates significantly with the mental component subscale in the Short Form Health Survey (Ware, Kosinski, & Keller, 1996).

Other measures

In addition to clinical outcome measures, the current study included several measures to explore possible change in cognitive and behavioural characteristics related to excessive worry as a result of treatment. Areas of interest also included problem solving orientation, avoidance and intolerance of uncertainty.

The Social Problem Solving Inventory – Revised Short Form (SPSI-R:S; D'Zurilla, et al., 2002)

The SPSI-R:S is a 25 item measure used to assess five problem solving dimensions, taken together to measure problem orientation and problem solving styles. The dimensions include positive problem orientation (PPO), rational problem solving (RPO), negative problem orientation (NPO), impulsivity/carelessness style (ICS) and avoidance style (AS). Standard scores for each individual's total score are calculated using the age-based normative data provided in the measure's manual. NPO, ICS & AS scores are reversed and combined with PPO and RPO to form the total score where a greater score indicates greater problem solving orientation. Good psychometric properties have been demonstrated with adequate internal consistency (PPO = .76; RPO = .92; NPO = .91; ICS: .83 and AS: .88) for each of the

measures and good test-retest reliability at three weeks ($r = .87$) (D'Zurilla, et al., 2002). In the current study, the total SPSI-R:S was used as a measure of problem solving orientation and the AS score was also used to measure avoidance.

The Intolerance of Uncertainty Scale (Freeston, et al., 1994)

The English translation (Buhr & Dugas, 2002) of the original French version of the IUS (Freeston, et al., 1994) is a 27 item self-report measure developed to assess beliefs about uncertainty, i.e. “reactions to ambiguous situations, implications of being uncertain and attempts to control the future” (p 791; Freeston, et al., 1994). The English version of the IUS (Buhr & Dugas, 2002) demonstrated excellent internal consistency ($\alpha = .94$) and adequate test-retest reliability at five weeks ($r = .74$). Whilst the IUS is reported as having four factors, the significant overlap of the factors and the items in those factors meant that a total scale score is most commonly used (Antony, Orsillo, & Roemer, 2001).

Treatment

Behavioural Activation for Worry (BAW) treatment included seven weekly two-hour sessions. A treatment manual was adapted for excessive worry largely based on the Behavioural Activation for depression handbook, *Overcoming Depression One Step at a Time* (Addis & Martell, 2004). The approach in this handbook has been based on several large controlled research studies demonstrating BA to be an effective treatment for depressed individuals (Dimidjian, et al., 2006; Jacobson, et al., 1996). The foundations of the treatment models are based on the behavioural interventions recommended by Beck (1976).

The adapted treatment for BAW is consistent with previous BA programs that emphasize functional outcomes (Chu et al., 2009) where participants identify functional domains which they want to enhance. Goals are identified in relation to these domains and broken down into small steps which are completed as weekly homework tasks. The core

strategies in BAW do not differ from BATD. The psychoeducation and treatment focus of BAW emphasize how behavioural reactions to events interact with worry to exacerbate or maintain depressive or anxious symptomatology. In addition, the treatment manual also includes applications of BA applied to assertiveness to illustrate how behavioural avoidance can appear in interpersonal interactions. Given the common link between assertiveness and anxiety disorders (Reiter, Otto, Pollack, & Rosenbaum, 1991), worriers commonly avoid confrontations and situations which require negotiation. Further, a number of participants in the current study reported having sleep difficulties upon start of treatment, so a brief section on sleep hygiene was included to prescribe appropriate behavioural changes for insomnia. This inclusion is supported by findings that a significantly large proportion of individuals who seek treatment for insomnia are diagnosed with anxiety disorders, particularly those who worry excessively (Belanger, Ladouceur, & Morin, 2005).

Consistent to BATD, one of the core components of BAW treatment is the use of functional analysis to explain the maintenance of worry through negative reinforcement of behaviours (Dimidjian, et al., 2011; Ferster, 1973). The functional analysis focuses on assessment and treatment of avoidance behaviours - variability of (1) Worry (e.g. differences between helpful and unhelpful thinking about problems); (2) Associated behaviours and (3) Counter-worry behaviours such as effective engagement in tasks. This detailed analysis of context and function is then used to help clients: (1) Recognise warning signs for worry; (2) Develop alternative strategies and contingency plans, some helpful alternative behaviours including allowing worry to cue the clients to take action, attending to their experience, etc.; (3) Alter environmental and behavioural contingencies maintaining worry. A general outline of the treatment program is included below:

Session 1

Session 1 began with psychoeducation regarding worry and the BA treatment model. This included: functional impact of excessive and uncontrollable worry, confronting avoidance and a model of BA. Education on worrying and related thinking styles was also provided and group exercises helped to differentiate between helpful and unhelpful thinking styles. Participants were introduced to the concept of self-monitoring by completing a Daily Activity Record for the following week and developed a worry cycle to illustrate how avoidance perpetuated distress and further anxiety. An example of a Worry Maintenance Cycle is presented in Figure 1.

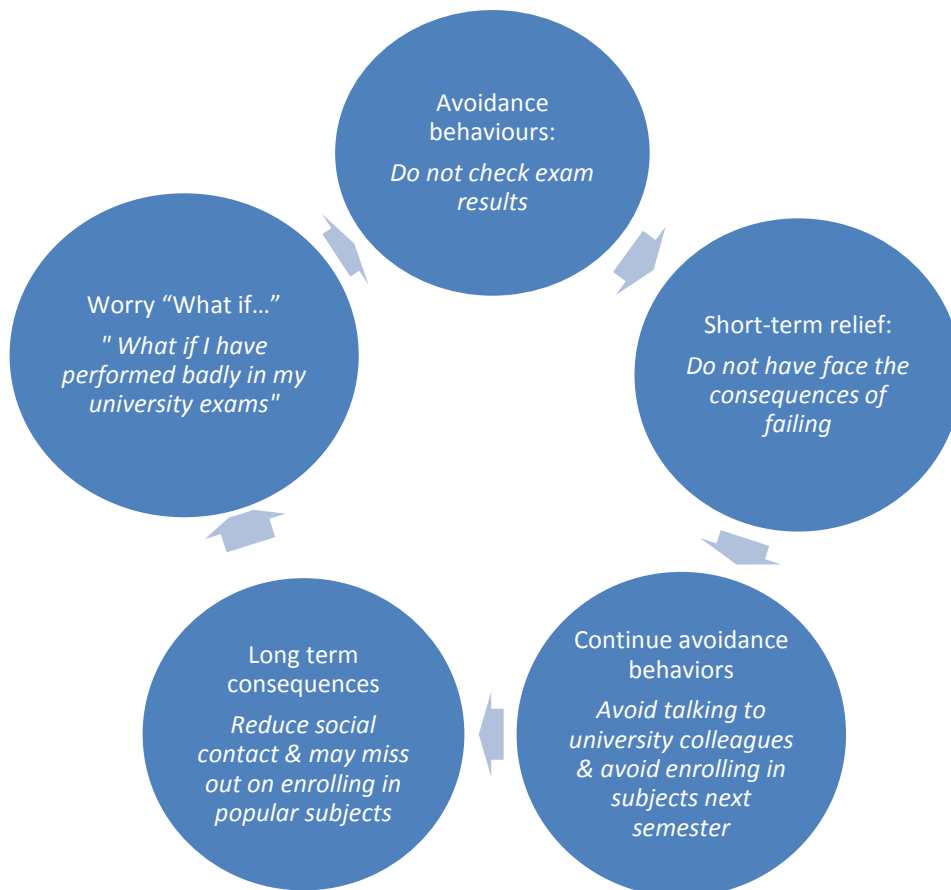


Figure 1: Worry Maintenance Cycle

Session 2

The second session started with reviewing the self-monitoring form and worry cycle. From this, individuals were supported to perform an individual functional analysis to map out their avoidance behaviors. Through the functional analysis and education on the avoidance function of worry, participants were taught to be aware of the contingency between certain activities and their levels of arousal, tension and worry. Treatment goals were created to allow individuals to target topics of worries where behavioural avoidance was present. Vignettes were presented to illustrate strategies to gaining control over worry. Participants were given homework to practice a “two minute rule” to recognize worry and monitor its occurrence throughout the week.

Session 3

This session provided psychoeducation as well as individual support in problem solving skills and developing alternative strategies to avoidance.

A review of the homework from Session 2 enabled therapists to continue demonstrating functional analyses of participants' avoidance behaviours. Participants began to perform functional analyses of fictional characters through the use of case illustrations and worked together as a group to identify avoidance behaviours and potential consequences. An acronym of TRAP – Trigger, Response, Avoidance Pattern (Addis & Martell, 2004) was introduced to help identify specific worry situations and the sequence of events that trigger and maintain the worry. Participants were encouraged get back on TRAC (Trigger, Response, Alternative Coping) by responding with active behaviours in accordance with their goals rather than avoid to ‘get rid of bad feelings’. Examples of alternative coping strategies were discussed with the group. During the following week, participants were asked to practice identifying their personal TRAPs and identify alternative active responses to these worry triggers.

Session 4

Much of Session 4 was dedicated to explaining the idea of functional analysis and alternative coping. Therapists provided individual support in problem solving and developing alternative strategies to avoidance with each participant. Participants were also taught skills to break down alternative coping behaviours into specific achievable units to facilitate successful behavior change. For instance, participants who avoided work tasks and colleagues at work may be assisted to create a to-do list, break down each work task into achievement units, ask for help from their colleagues, and so forth. The purpose was that successful completion of a subtask will in turn reinforce and motivate the individual to continue with the next subtask to ultimately complete the entire task. Participants were reminded during this process that the aim was to get started working on important tasks, increase activation and disrupt avoidance. The importance of repetition and integrating change into daily routine was emphasized throughout. Homework tasks involved completing TRACs, breaking down behaviours into doable steps and committing to gradual exposure starting from low grade tasks.

Session 5

Participants were taught to observe the results of their TRACs from the previous week and evaluate their own progress. During this process therapists continued to emphasize the long term detriment of avoidance behaviors (including worrying). Participants were taught a process of selecting rewards for incremental behavioural change and to reinforce the use of alternative active behaviours over avoidant behaviours. In this session, participants were taught basic sleep hygiene strategies (e.g. no caffeine after 3pm, regular sleep and wake patterns, a regular bedtime routine, etc.) and relaxation strategies to improve their sleep. Homework involved continuing to progressively try out alternative coping behaviours in relation to their worry topics and practicing the relaxation strategies.

Session 6

Session 6 involved a discussion of application of BA for interpersonal interactions. Assertive communication was described as a form of non-avoidant behaviour that is helpful in confrontations and negotiations. Different communication styles (passive, aggressive and assertive) were introduced and practiced through group discussions and role plays.

The final part of the session involved linking short-term treatment goals set in session 2 with long-term life goals. From here, participants developed a hierarchy of steps based on selected activities towards achieving their long term goals. This was aimed at encouraging participants to actively consider and take proactive steps towards a fulfilling life based on their broader life goals.

Session 7

The last session focused on review and consolidation of treatment gains. Participants were asked to review the treatment gains they had made and reflect back on changes to their avoidance and approach behaviours over the last seven weeks. Relapse prevention also formed a large part of the session to ensure that participants were able to continue with the process with future worries. Participants were assisted to identify upcoming events which were likely stressors and draft a self-help plan to activate in the face of a stressful situation. Finally, therapists reviewed the basic skills taught in the course of seven weeks to ensure that participants leave the treatment with a consolidated understanding of how to apply the skills on their own.

Training and supervision of therapists

The two treatment groups were co-facilitated by a registered psychologist with one year clinical experience and trained in cognitive behavioural therapy. A co-therapist was present in the first group. The co-therapist was a trained CBT therapist with ten years of

experience. The therapists delivered the treatment within the treatment protocol and received weekly supervision from the Clinical Director of the Centre for Emotional Health, Macquarie University.

Results

Due to the small sample size and the nature of pilot study, descriptive analysis was undertaken instead of statistical analysis. First, to explore the effectiveness of the treatment, the pre-treatment and post-treatment scores for the primary outcome of PSWQ score were compared. Individuals were considered to show high end-state functioning if they fell into the normative range (i.e. within 1 *SD* of the published norm) (Ladouceur, et al., 2000). Participant GAD criterion was also compared between pre and post treatment.

In addition, the percentage of participants who showed clinically significant change on the primary outcome measure was calculated based on reliable change index (RCI; Jacobson & Traux, 1991). The RCI can be used to determine if the magnitude of an individual participant's change following treatment is statistically reliable. Change scores (i.e., RCI) greater than 1.93 are considered to be statistically significant and clinically meaningful. Accordingly, change in excessive worry from pre to post treatment was obtained by using the following formulation: $RCI = (x_1 - x_2) / S_{diff}$ where x_1 = pre-treatment score, x_2 = post-treatment score.

Additional clinical outcomes were examined by comparing pre and post scores. These included the GAD Q, DASS 21 (depression, anxiety and stress scales) and LIS (life interference). Finally, pre and post scores of process measures were also examined. These included the SPSI-R:S and the IU.

Demographic characteristics of the participants.

Table 1 shows the demographic characteristics of participants. None of the seven participants had been married or had children. Three of the participants were of Chinese ethnicity (43%), three were Anglo Australian (43%) and one participant (14%) was born in Eastern Europe. Of these participants, 43% reported that English was their second language and they had lived in English speaking countries for no longer than three years.

Table 1. Pre-Treatment and Post-Treatment Outcome Measure Scores

	Age	Sex	Pre Tx Diagnoses		DASSd	DASSa	DASSs	LIS
1	19	F	GAD	Pre	2	-	18	34
				Post	-	-	10	10
2	20	F	GAD Dys SP	Pre	22	14	34	38
				Post	4	10	26	17
3	21	F	SP GAD Dys	Pre	14	20	32	24
				Post	14	24	24	20
4	22	F	SP GAD	Pre	6	12	8	34
				Post	12	12	18	32
5	26	F	GAD SP	Pre	10	20	22	30
				Post	2	8	20	17
6	23	F	GAD SP OCD	Pre	8	-	-	22
				Post	10	2	4	19
7	31	M	GAD	Pre	20	8	24	38
				Post	8	4	20	19
Mean	23yrs	F 86%		Pre	12	11	20	31
SD	4.1 yrs	M14%		Post	7	8.6	17	19
				Pre	7.3	8.4	12	6
				Post	5	8.1	8	7

Note. DASSd=Depression Anxiety and Stress Scale Depression subscale; DASSa=Depression Anxiety and Stress Scale Anxiety subscale; DASSs=Depression Anxiety and Stress Scale Stress subscale; LIS=Life Interference Scale; GAD=Generalised Anxiety Disorder; Dys=Dysthymia; SP=Social Phobia; OCD=Obsessive Compulsive Disorder. Reduced scores indicate improvements in distress (depression, anxiety and stress scores) and life interference.

Primary outcome measure

The mean score for excessive worry at pre-treatment was 65 ($SD = 5.9$). This score is at the 90th percentile when compared to community norms (Gillis, et al., 1995) and within 1 standard deviation of the mean score for individuals diagnosed with GAD: 68.11 ($SD = 7.33$) (Fresco, Mennin, Heimberg, & Turk, 2003). Figure 2 demonstrates that the intervention was successful in reducing excessive worry for all participants, and four out of the seven participants scored at least 1 SD below the normative mean. In addition, according to the reliability change index (Jacobson & Traux, 1991), Three out of seven participants (43%) showed clinically significant change at $\alpha = .05$. Finally, according the GAD Q scores, all seven of the participants met criteria for GAD at pre-treatment (see Table 2) whereas four out of seven (57%) of participants no longer met criteria for GAD at the end of the seven week group treatment.

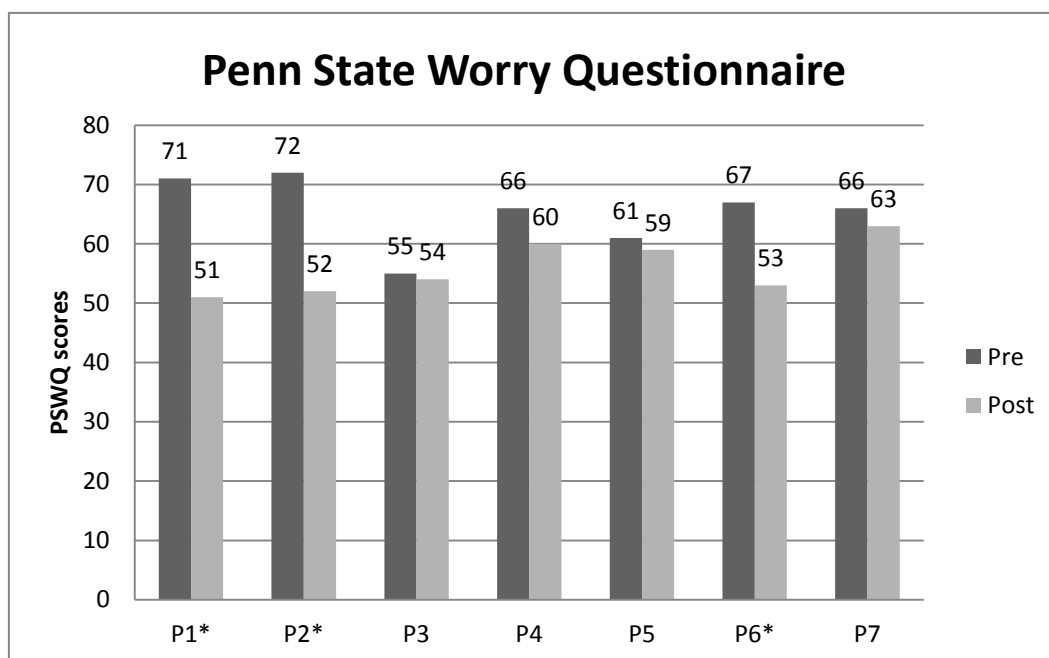


Figure.2. Pre Treatment and Post Treatment PSWQ scores

Note. * Indicates participants who experienced clinically significant change based on the Jacobson & Traux change index (1991). Reduced scores indicate improvement in worry.

Table 2. Pre-Treatment and Post-Treatment GAD Q Scores

Criterion for GAD		
P1	Pre	yes
	Post	yes
P2	Pre	yes
	Post	no
P3	Pre	yes
	Post	no
P4	Pre	yes
	Post	yes
P5	Pre	yes
	Post	yes
P6	Pre	yes
	Post	no
P7	Pre	yes
	Post	no
	Pre	7 met criteria
	Post	3 met criteria

Note: Criterion for GAD diagnosis: (A) experiencing excessive and/or unrealistic worry, (B) being bothered by worries more days than not over the past 6 months, (D) 6 or more symptoms associated with GAD are present in the past 6 months. Participants are categorised as GAD when they meet criteria (A), (B) and (D).

Clinical outcomes

Depression symptoms reduced for 54% of participants with the largest reductions for Participant 2 and Participant 7 who dropped from severe to normal levels of depression (see Table 1). On average there was a reduction of five points ($SD = 8.5$) at post treatment and the severity ratings dropped from mild depression to normal levels of depression - based on the DASS 21 cut-off (Lovibond & Lovibond, 1995). Measures of physical arousal measured by

the DASS 21 anxiety scale reduced across the group by two points ($SD = 5$) and improvements were seen for 43% of the participants. 71% of participants reported reductions in stress symptoms and overall, participants improved by two points ($SD = 7$). Participant 2 and Participant 3 experienced the greatest change, reducing their reported level of stress from severe to moderate. Life interference reduced across all participants, with reductions most substantial for Participants 1, 2, 5 and 7. An average of 12 points ($SD = 9$) reduction was found between pre and post treatment scores.

Process measures

The Intolerance of Uncertainty scale (Freeston, et al., 1994) scores demonstrated reductions in participants' intolerance to uncertainty for all but one participant (Participant 4 remained on similar levels). Overall the mean reduction was nine points with a SD of ten. To examine the impact of the treatment on problem solving scores, SPSI-R:S total pre- treatment score as well as SPSI-R:S Avoidance Style subscale pre-treatment scores were compared with their respective post treatment scores (see Table 3). The average problem solving orientation score improved by .5 points ($SD = 2.7$) and avoidance score by .16 ($SD=1.1$) demonstrating a relatively small improvement in problem solving orientation and reduced avoidance. This improvement was seen from five out of the seven participants for the overall problem solving orientation as well as reduced avoidance.

Table 3. Pre-Treatment and Post-Treatment Process Measure Scores

Participant		IU	SPSI-R:S	SPSI-R:Sa
1	Pre	90	10.8	1.2
	Post	71	15	3.2
2	Pre	108	11	1.8
	Post	93	10.2	1.2
3	Pre	81	11.2	2.4
	Post	79	11.4	2.2
4	Pre	64	8	1.6
	Post	65	12.2	3
5	Pre	84	13.2	3.6
	Post	82	10.8	2.8
6	Pre	95	11	3.2
	Post	71	10.4	2.8
7	Pre	66	12	2.6
	Post	64	10.4	2
Mean	Pre	84	11	2.3
	Post	75	11.5	2.5
SD	Pre	16	1.7	1
	Post	10	2.7	1.1

Note. IU=Intolerance of Uncertainty scale; SPSI-R:S=Social Problem Solving Inventory Short form total score; SPSI-R:Sa= Social Problem Solving Inventory Avoidance Style subscale score. Reduced scores indicate improvement in intolerance of uncertainty and increased scores indicate improvements in problem solving and avoidance.

Discussion

The current study delivered a pilot study evaluating a seven session group based behavioural activation treatment for excessive worry. Our preliminary results show promise for the use of behavioural activation in reducing excessive worry. 43% of participants demonstrated clinically significant change on the primary outcome of excessive worry and 57% no longer met GAD diagnostic criteria at the end of the seven week treatment. These results are comparable to the efficacy seen in traditional CBT treatment where only about half of participants return to high end state function at the end of an average of 10 sessions of treatment (Borkovec & Whisman, 1996; Roemer & Orsillo, 2002). Despite the lack of focus on depression treatment, six out of seven participants demonstrated reductions in their depressive symptoms from severe to normal or mild levels at post treatment. Improvements in life interference were most pronounced with improvements across the entire group. Tolerance of Uncertainty also improved for all but one participant. Mild improvements were seen in problem solving orientation and avoidance. Improvements were seen between 71-86% of participants. Due to the small sample size, the relationship between these factors and the degree of change could not be inferred. Future studies will benefit from exploring these factors as potential mechanisms of change.

Several other interesting results also emerged in this study. In particular, life impairment reduced to a much greater degree compared to symptom relief including worry and distress symptoms. The premise of Behavioural Activation and Behavioural Activation for Worry involves a clear functional analysis of the impact of avoidance reactions on their quality of life and resulting lack of positive reinforcement. Through this, individuals are guided to take gradual steps towards enhancing functional domain goals. Given this focus of BAW, participants are likely to experience greater improvements to their life interference compared to depressive and anxious symptoms in the initial period after treatment.

Several clinical insights were gained from this study. It appears that BAW lends itself to applications with certain worries more readily than others. For issues that were concrete and current (e.g. worrying about academic progression, procrastination, dealing with immediate relationships with colleagues, applying for work), participants were more able to identify alternative coping strategies. With more distal issues such as future and past orientated concerns (e.g. how to pay my parents back for my education, career options, will I be single for the rest of my life), behavioural interventions were less obvious. This was illustrated by participants Participant 1 and Participant 2 who were more able to identify behavioural steps for their worries regarding procrastination, and guilt about not completing tasks. This contrasted with Participant 4 who wanted to address worries regarding moving overseas when she graduated from university and difficulties forming romantic relationships. Despite guidance to focus on breaking down long term goals into smaller achievable goals and steps, Participant 4 struggled to identify alternative options. These differing contents of worry may have contributed to the varying degrees of treatment success. Future studies may benefit from exploring treatment efficacy with different worry content in a more systematic manner. Further identifying BA techniques targeting on more distal worries may also benefit future studies.

Perceived controllability of the worries appears to be another category of worries which are difficult for individuals to utilise BA strategies. For example, when comparing the previously described categories of worries, it can be argued that there is greater objective controllability over current worries relative to future orientated worries. Davey (1994) suggests that when individuals experiencing high levels of trait anxiety encounter an uncontrollable stressor, they are likely to adopt cognitive styles which exacerbate rumination on the problem and catastrophic thinking. This is illustrated in the current study where Participant 5 initially focused on the worry of “would people judge me for coming from a broken home”. Participant 5 struggled to identify alternative coping strategies became

intensely frustrated. Over the course of the program, she was guided to identify functional domains and avoidance reactions relating to this worry and use the negative internal experience of the worry as a cue to engage in active behavioural steps. When Participant 5 was able to practice these skills on more current worries e.g. workplace performance, she became more skilled at generalising across to worries which were initially perceived with lower controllability.

There were several positive aspects to using BAW. For some of the participants, behavioural interventions and functional analysis allowed them to bypass the focus on analysing and changing their thoughts or internal experience. Participants who had previously attended CBT treatment reported finding this particularly helpful. For instance Participant 1 and Participant 2 both reported that a struggle they had in previous treatment was the over-analysing of thoughts i.e. why they felt the way they did and was it helpful to worry. Whereas in the past they would get into a bind with analysing evidence for and against the validity of their thoughts, by focusing on the avoidant function of worrying, they learnt to focus on behavioural steps towards their goals instead. As result, their negative internal experiences became a cue to action, rather than a source of distress. This illustrated the benefits of a few sessions of short term intervention as Participant 1 and Participant 2 felt they were able to generalise these skills towards bigger worries and felt more capable of coping with future worries.

There were also some difficulties encountered in the current study which can be attributed to the use of a purely behavioural intervention. Participants initially struggled with the idea of acting “despite” fear i.e. engaging in alternative coping without any strategies to reduce their fear. In traditional CBT, the use of cognitive restructuring prior to behavioural interventions would typically provide individuals with reduce anxiety prior to engaging in behavioural strategies. In a behavioural activation model, participants were expected to make these changes prior to changes in threat appraisal. The reluctance to act reduced as initial

steps were taken and for participants who experienced a degree of initial success, progress occurred more readily. In contrast, those who didn't experience initial success such as Participant 4 and Participant 5, found it much more difficult to continue staying motivated despite efforts to guide them in creating tangible treatment goals and breaking them down into steps. This finding suggests a potential difficulty to tackling worry using a purely behavioural approach. As this is the first study to explore the efficacy of behavioural activation on worry, it is unclear whether it is a limitation of this particular treatment protocol or a conceptual disadvantage that requires further exploration.

To our knowledge, this is the first group based treatment study exploring worry as a transdiagnostic focus using behavioural activation as the treatment. While these results are too preliminary to demonstrate overall program efficacy, they reveal a promising trend towards reduced impairment and psychopathology within a relatively short period of time. The low attrition rate also suggests that the treatment was feasible for the group delivery format: 0% dropout for current study compared to 8% in Jacobson's study (1996). The program appears to be able to accommodate a diverse client group with 57% of participants from non-Anglo Australian backgrounds and 43% reporting English as their second language. This is likely due to the very applied and practical nature of BAW, particularly compared to the language-based focus of cognitive therapy. The abstract nature of challenging irrational thought and testing the validity of thoughts is often criticised (Hofmann & Asmundson, 2008), particularly when working with populations with poorer linguistic skills or abstract thinking (Sams, Collins, & Reynolds, 2005). Given this, BAW may present itself as a possible alternative treatment for clients who traditionally find CBT difficult, including those with learning disabilities or those from non-English speaking backgrounds.

There are a number of limitations to be considered. Firstly, this study only included seven participants. The homogenous nature of the sample – full time university students between the ages of 19 and 31 – greatly limits the generalizability of the data. Replications in

the form of randomized control trials using a larger sample size and follow-up measures would be recommended. Potentially, future trials will also benefit from non-treatment controls and/or component analysis trials comparing behavioural treatment with the full package of CBT, similar to that seen in the original Jacobson study (Jacobson, et al., 1996). Secondly, the study was hindered by the lack of standardised measures of behavioural and cognitive avoidance. Another consideration is the limited BA training of the treatment facilitators and lack of supervision from BA specialists. It is likely that improved specialist training for facilitators would have enhanced treatment outcome. Future studies will benefit from incurring further training by BA specialists as well as measuring treatment adherence. Finally, the lack of post treatment follow-up meant little is known about the long term efficacy of BAW treatment. Future studies will benefit from follow-up of treatment effects.

Even with these limitations, the encouraging results from this study support the extension of BA protocols to group based worry treatment. This is consistent with results from a handful of studies delivering BA treatment for mixed presentation of depression and anxiety (Chu, et al., 2009; Hopko, Roberston, & Lejuez, 2006). Given these findings, BAW presents future promise as a simple and cost-effective transdiagnostic intervention. It provides an alternative to cognitive based treatments in particularly for excessive worry. Future studies can expand on the trials to compare efficacy of BAW for different worry content and compare BAW with control conditions to generalise the findings.

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CHAPTER FOUR

BEHAVIOURAL ACTIVATION: A CONTROLLED TRIAL OF A TRANSDIAGNOSTIC TREATMENT FOR EXCESSIVE WORRY

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Abstract

Transdiagnostic treatment interventions present pragmatic benefits in treatment dissemination and training of mental health professionals when faced with high levels of co-morbidity across emotional disorders such as anxiety and depression. Excessive worry is a common feature across emotional disorders and thus represents an ideal candidate target for transdiagnostic intervention. The current study describes a controlled trial utilising a modified behavioural activation treatment adapted for mixed emotional disorder presentation. Behavioural Activation for Worry (BAW) targets avoidance behaviours in excessive worriers (e.g. procrastination, reassurance seeking) whilst improving problem orientation by increasing active goal orientated behaviours. 49 individuals experiencing excessive worry were randomised into waitlist or treatment group receiving an 8 week group based BAW intervention. Results demonstrated that BAW was successful in reducing excessive worry, symptoms of generalised anxiety, life impairment, cognitive and behavioural avoidance and improving problem solving orientation. Twice as many individuals showed clinically significant reductions in excessive worry after BAW treatment compared to the waitlist control. Despite limitations to sample size and power, this study presents promising support for BAW as a practical and effective transdiagnostic treatment of emotional disorders. Regression results also demonstrate that changes in behavioural avoidance strongly predicts improvements to excessive worry at post treatment and follow-up.

Introduction

Anxiety and depression are the most commonly reported psychological problems in adults and cause significant burden to health services across the world. More than one quarter of the adult American population report having experienced an emotional disorder at some time in their life, with a 29% prevalence of anxiety and 21% prevalence of mood disorders (Kessler, et al., 2005). While anxiety and depression cause substantial impairment separately, there are added complications when these disorders are experienced concurrently. Up to 55% of individuals diagnosed with an anxiety disorder report an additional anxiety or mood disorder at the time of assessment, which increases to 76% with a lifetime diagnosis (Brown, et al., 2001). Despite this high level of co-morbidity, clinical interventions continue to be dominated by a proliferation of disorder specific treatments (Ellard, et al., 2010). These interventions are often lengthy (mean of ten sessions; Gould, et al., 1997), costly to the public health care system and require a great deal of clinical expertise (Borkovec, 2002; Jacobson, et al., 2001). Clinicians require substantial training to treat each diagnostic category but often lack expertise when faced with common patterns of accompanying co-morbidity (Wilamowska, et al., 2010). A transdiagnostic treatment approach will typically target common features that produce symptoms in related classes of disorders, such as mood and anxiety disorders (Ehrenreich-May & Bilek, 2012). This allows greater flexibility and convenience for the training of clinicians and service provision of clients by providing a common treatment protocol across a range of commonly co-occurring disorders.

Worry is often experienced concurrently with emotional disorders (Borkovec, et al., 1998; Brosschot, et al., 2006; Stanley & Gibson, 1985) and presents an ideal target for transdiagnostic treatment. Worry is an essential feature of Generalised Anxiety Disorder (GAD; American Psychiatric Association, 1994) and considered to be a presenting characteristic across all anxiety disorders (Barlow & Di Nardo, 1991). Commonly defined as a repetitive negative valenced thinking process, worry is best understood as an unsuccessful

attempt to prevent the occurrence of negative events or to devise coping strategies in case such events occur (Borkovec & Roemer, 1995). It functions as an avoidant response which brings initial relief but also interferes with emotional processing, resulting in the maintenance of anxiety (Borkovec, et al., 1998). Research by Nolen-Hoeksema (2000) also suggests that worrisome thinking is a process closely linked to rumination, a factor which can maintain and exacerbate negative affect in depression. McLaughlin and colleagues (2007) found that laboratory inductions of worry with non-clinical participants elicited both anxiety and depression in nearly equal parts. In addition, worry and rumination also appeared to interact to affect mood and anxiety levels. The authors inferred that worry may in fact be a mediator of the relationship between trait negative affect and state experiences of anxiety and depression.

Research with individuals diagnosed with GAD has revealed a wealth of information about worry. Individuals who worry excessively have difficulties dealing with uncertainty, reducing their ability to resolve problematic situations (Tallis, et al., 1991) and are more likely see a problem as a threat to be avoided rather than a challenge to be met (Ladouceur, et al., 2000). This is despite the fact that their actual knowledge of problem-solving is normal (Davey, 1994). The avoidant function of worry holds conceptual similarity to rumination. Individuals who engage in rumination are also found to have less confidence and satisfaction with self-generated proposed solutions and are less likely to follow through with a generated solution (Lyubomirsky, et al., 1999). It appears that for both worriers and ruminators, the repetitive negative thoughts disrupt the implementation of effective strategies to solve problems, resulting in maintained or exacerbated levels of distress (Hong, 2007).

Behavioural Activation (BA) treatment, an intervention which addresses patterns of avoidance in depression (Dimidjian, et al., 2006; Jacobson, et al., 1996), has demonstrated adequate conceptual fit as a possible transdiagnostic treatment for depression and anxiety disorders (Chu, et al., 2009; Turner & Leach, 2009, 2010). In depression, BA targets dysfunctional patterns of avoidance, withdrawal and inactivity which serve to maintain

depressive symptoms and prevent effective problem solving (Martell, et al., 2001). BA for depression is also described as a parsimonious treatment, equally effective but simpler to deliver than the full package Cognitive Behavioural Therapy (Dimidjian, et al., 2006; Jacobson, et al., 1996), and is effective even when delivered by mental health professionals with minimal training (Ekers, et al., 2011). Taking into account parsimony, an effective BA treatment targeting worry has potential cost effectiveness benefits in terms of training of therapists and treatment dissemination (Jacobson, et al., 2001; Longmore & Worrell, 2007).

When applied to worry, BA is expected to break down patterns of anxious avoidance through repeated exposure to goal orientated behaviours (Chu, et al., 2009). For example, an individual who is worried about a workplace conflict and avoids dealing with issues at work may benefit from practicing assertive communication and taking gradual steps towards discussing issues with colleagues. By increasing the range of alternative approach responses to the worry-provoking situation, access to potential positive reinforcers is also increased. The reduction of fear of task difficulty or threat through repeated exposure provides further negative reinforcement towards avoidant behaviours (Turner & Leach, 2009). The repeated exposure towards anxiety provoking situations is expected to result in fear extinction and increased problem solving orientation (Andrews, et al., 1994; Ladouceur, et al., 2000). Over time, the individual is expected to experience reduced worrying, anxious symptomatology and life impairment.

Application of BA to worry will also be unique in targeting interference and distress caused by behavioural avoidance. Worry is largely viewed as a cognitive avoidant response to suppress emotional processing required for fear extinction (Borkovec, et al., 1998). This conceptualisation has resulted in a focus on strategies to reduce cognitive avoidance in the treatment of excessive worry (Beesdo-Baum, et al., 2012; Behar, et al., 2009; Roemer & Orsillo, 2002). However, there is a growing body of evidence highlighting the role of behavioural avoidance in the maintenance of worry. Clinicians report that individuals

diagnosed with GAD engage in a range of behaviours that are aimed at reducing distress in the short term but contribute to the long term maintenance of their symptoms (Beesdo-Baum, et al., 2012; Hazlett-Stevens, 2008; Wells, 1999). These include seeking reassurance, checking behaviours or overt avoiding of situations and activities that are anxiety provoking (Beesdo-Baum, et al., 2012). Liu and colleagues (2012a) recently explored several factors including problem solving orientation, cognitive avoidance and behavioural avoidance, that may maintain emotional distress in non-clinical worriers. The authors found that cognitive avoidance only had an indirect relationship with distress through behavioural avoidance. These results suggest that behavioural avoidance may not only act as a consequence of worry but also play a causal role in the maintenance of worry, over and above cognitive avoidance. Furthermore, the pilot study conducted by Liu and colleagues (Liu, Chen, Rapee, & Gaston, 2012b) demonstrated that BAW had a positive impact on a series of process factors including problem solving orientation, cognitive avoidance, behavioural avoidance as well as intolerance of uncertainty. Owing to the limited research that examines the nature of behavioural avoidance in excessive worriers, much is still unknown of the processes which interact with this variable.

BA for worry (BAW) is a novel treatment which targets the link between behavioural avoidance and worrying. To date, there has only been a handful of single case studies that have applied BA to the management of anxiety (Armento & Hopko, 2009; Hopko, et al., 2006; Turner & Leach, 2009, 2010). To our knowledge, none have compared the application of BA to anxiety with a control condition. Furthermore, as Turner and Leach (2010) suggest, BA treatment studies with anxiety to date have a propensity towards a simplistic application of behavioural strategies such as graded exposure rather than tailoring Jacobson's (1996) original BA model to accommodate anxiety models. One study which best describes the modification of BA for mixed emotional disorders was conducted by Chu and colleagues (2009) with a population of adolescents in a high school setting. Results from this

uncontrolled study demonstrated reductions in anxious and depressive symptoms, supporting the use of BA treatment as a transdiagnostic approach for emotional disorders. More recently, Liu and colleagues (2012b) conducted an uncontrolled pilot with seven adults reporting difficulties controlling worry. Using a modified BA treatment protocol for worry (BAW), 43% of participants demonstrated clinically significant reductions in worry symptoms and 57% no longer met criteria for a GAD diagnosis after the seven week treatment. Measures including life interference, intolerance of uncertainty and problem solving orientation also improved, suggesting that BAW may have an effect on worriers' willingness to resolve difficulties despite feelings of uncertainty.

The current paper attempts to extend these findings in a randomised controlled trial with high level worriers. Specifically, the study examines: 1) the efficacy of BAW compared to waitlist; and 2) whether changes in putative process factors such as problem solving orientation, behavioural avoidance, cognitive avoidance and intolerance of uncertainty are related to immediate and long term levels of worry. These factors were shown to contribute to symptoms of emotional distress including worry, depression and anxiety symptoms in two previous studies which inform this treatment (Liu, et al., 2012a; Liu, et al., 2012b). It is expected that changes in behavioural avoidance will have an impact on excessive worry scores.

Method

Procedure and Participants

Recruitment for participants to the free treatment trial took place through local newspaper stories and posters on community noticeboards. Inclusion criteria for treatment included age (18-65 years), self-reported excessive and uncontrollable worry, a stated treatment goal to address generalised worrying, and raw scores of 55 or higher on the Penn State Worry Questionnaire (PSWQ; Meyer, et al., 1990) (i.e. within 1 standard deviation of

GAD means; Gillis, et al., 1995). Participants were excluded if they reported active suicidal ideation, active psychosis, alcohol or drug dependency and current treatment for worry related issues. Antidepressant medication was not an exclusion criterion provided participants agreed to stay on constant dosage for at least two months prior to treatment and/or waitlist and continue on the dosage until the end of the follow-up period (1 month).

Figure 1 presents a diagram of participant flow. Of the 151 participants who contacted the study over the recruitment period of 12 months, 130 were contacted for assessment and 94 met telephone screening (experienced excessive and uncontrollable worrying, suitable treatment goal) and were sent initial questionnaires. Of the 73 questionnaires that were returned (18 were could not be contacted and three had sought other treatment), three had reported active suicidal ideation upon which suicide risk assessment was performed and appropriate referrals were made, one reported alcohol dependence and was referred, and seven reported levels of PSWQ below 55. Of the 62 participants invited to the study, three started other treatment and ten withdrew from study prior to randomisation. Individuals were randomly allocated to groups using a random number generator through Microsoft Excel package 2010. In total 49 adults (female: 77.6%) took part in the treatment program with 25 allocated to active treatment and 24 allocated to waitlist.

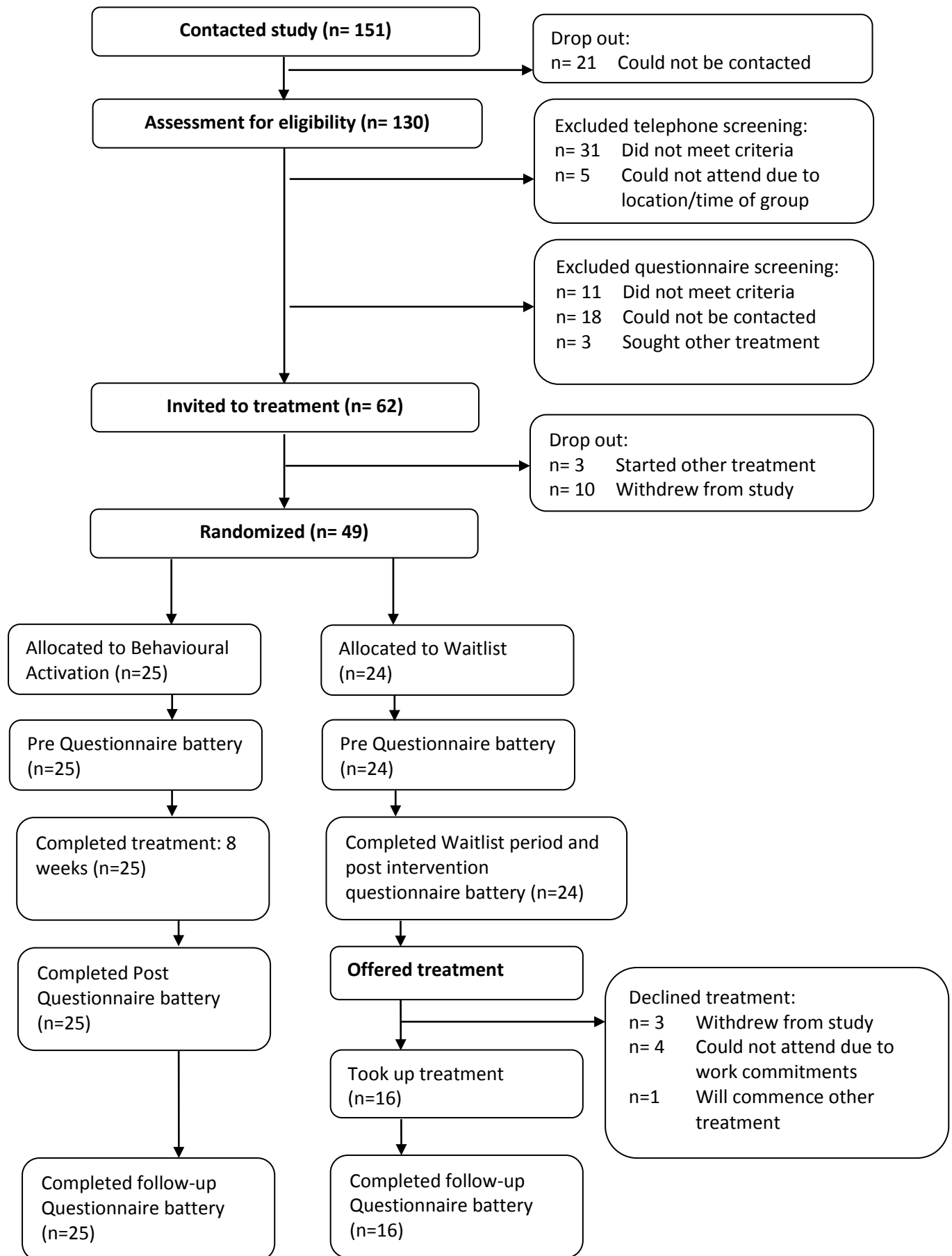


Figure 1. Flow diagram of participation.

Both waitlist and active treatment participants completed the assessment measures at Time 1 (pre-treatment and waitlist) and Time 2 (after eight weeks of treatment or waitlist period). Participants in active treatment also completed a follow-up assessment four weeks after completing the program (Time 3). Retention rates were excellent with no participants dropping out of the study. All waitlist participants were offered treatment after the eight week waitlist period. Nine out of 24 participants declined the offer of treatment due to: work commitments (5), starting other treatment (1) or no explanation (3). Waitlist participants who were later given active treatment also completed outcome measures at post treatment and at follow-up. In total, 40 participants completed treatments in seven groups of between five-seven participants.

Behavioural Activation for Worry Treatment

The group treatment was conducted with six- seven participants per group. Weekly sessions ran across eight consecutive weeks using a treatment protocol which was adapted and tested in a pilot study (Liu, et al., 2012b). The pilot treatment manual was largely based on a Behavioural Activation for depression handbook *Overcoming Depression one step at a time* (Addis & Martell, 2004). The approach from Addis & Martell (2004) was guided by the BA treatment used in several randomised control studies of BA for depression (Dimidjian, et al., 2006; Jacobson, et al., 2001; Sturmey, 2009). Several modifications were made to the manual after completion of the pilot trial. Treatment was extended from seven to eight sessions. It was found that with seven sessions, there was a very limited amount of time provided to guide participants in the application of Behavioural Activation. Further, a more in-depth discussion of participants' values and activities relating to these valued life domains was included. This section was based on the BA manual developed by Hopko and colleagues (2011).

Behavioural Activation for Worry (BAW) consisted of a structured program which used functional analysis to create awareness of avoidant patterns of behaviour and reduce the frequency of negatively reinforcing avoidant behaviours. A shared formulation was created to describe how worry is reinforced through patterns of avoidant behaviours. It was also emphasised that while avoidant responses provide short term relief, they also create long term negative consequences by preventing problem resolution and fear extinction. Participants were guided to identify short term goals and life goals, which together with the functional analyses of their avoidance patterns, helped guide the development of alternative goal orientated behaviours. Subsequent specific strategies were incorporated including self-monitoring, identifying ‘worry behaviours’ and behaviour scheduling in the form of weekly homework activities. Applications of BAW were discussed and practised using a range of activities including scenarios, role-plays and group discussions. In the final session, relapse prevention strategies were discussed at length in order to develop anxiety prevention strategies for later use. The overall goal of BAW was to re-engage participants with a diverse source of positive reinforcement that could provide an anxiolytic function.

Training and supervision of therapists

In total, seven treatment groups were delivered. Each treatment group was led by the first author, who is a registered psychologist with two years’ clinical experience, is trained in Cognitive Behavioural Therapy (CBT) and had run a pilot group for BAW (see Liu, et al., 2012b). A co-therapist also assisted with each group. There were three co-therapists across the seven treatment groups. Two co-therapists were four year trained psychology interns who took part in five of the groups. The third co-facilitator was a registered psychologist with two years clinical experience and trained in CBT. Regular supervision was provided by the Director of the Centre for Emotional Health, Macquarie University.

Clinical outcome measures

The Penn State Worry Questionnaire (PSWQ; Meyer, et al., 1990)

The PSWQ has 16 items that measure a trait-like tendency to worry. As one of the most widely used questionnaires to measure pathological worry, items have been demonstrated to have strong internal consistency for anxiety disordered ($\alpha=.93$; Brown, et al., 1992) and community populations ($\alpha=.95$; Olatunji, et al., 2007). Convergent validity is high when compared to other measures of worry and anxiety (Meyer, et al., 1990); and test re-test reliability is excellent ($r=.93$). There is high internal consistency for pre-treatment questionnaire ($\alpha=.81$). Internal consistency for post-treatment could not be calculated due to missing data.

Generalised Anxiety Disorder Questionnaire for DSM IV (GAD Q IV; Newman et al., 2002)

The GAD-Q-IV is a revision of the original GAD-Q to reflect DSM-IV diagnostic criteria (4th ed.; DSM-IV; American Psychiatric Association, 1994). The questionnaire is a self-report measure of GAD symptomatology, containing checklists of relevant symptoms and Likert rating scales to assess the degree of interference and distress from associated symptoms. GAD is indicated when the sum total falls above a nominated cut-off score (5.7) (Newman, et al., 2002). Agreement between clinician ratings using the Anxiety Disorders Interview Schedule for DSM IV (ADIS IV; Di Nardo, et al., 1994) and the GAD Q IV is good ($\kappa=.67$) with 88% of participants correctly classified. Test re-test reliability is high ($\kappa=.64$) and convergent validity is also adequate (Newman, et al., 2002).

The short form version of the Depression Anxiety Stress Scales (DASS 21; Lovibond & Lovibond, 1995)

The DASS 21 measures current symptoms of depression (dysphoric mood), anxiety (arousal) and stress (emotional distress). Each of the items is rated on a 4-point Likert scale.

Items in the stress scale are commonly associated with GAD symptomatology including muscle tension and agitation (Brown, et al., 1996). Favourable test retest correlations are indicated ($r = 0.71-0.81$) along with high internal consistency ($\alpha = .88$ for depression scale, .82 for anxiety, .90 for stress) (Lovibond & Lovibond, 1995). High internal consistency was found for all subscales at pre-treatment ($\alpha = .88$ for depression scale, .84 for anxiety and .86 for stress) as well as post-treatment ($\alpha = .94$ for depression scale, .91 for anxiety and .87 for stress).

The Work and Social Adjustment Scale (WSAS; Mundt, Marks, Shear, & Greist, 2002)

This is a widely used 5 item measure of general impairment across the domains of work, home, social, private leisure and interpersonal relations. Each item is rated on an 8 point Likert scale and a higher score indicates greater impairment. Internal consistency (α) ranges from .70 to .94 and test-retest reliability is .73 (Mundt, et al., 2002). Moderate sized internal consistency for the current study at pre-treatment ($\alpha = .68$) and post-treatment ($\alpha = .78$).

Process measures

The Cognitive-Behavioural Avoidance Scale (CBAS; Ottenbreit & Dobson, 2004)

This is a self-report measure of four domains of avoidance assessed on a 5-point Likert scale. The four factors derived from this measure of avoidance include – behavioural social, behavioural non-social, cognitive social and cognitive non-social. The subscales demonstrate high correlations and as such a composite avoidance score may be used with a coefficient alpha of 0.91. In the current study, the four factors were logically grouped to measure two constructs of cognitive avoidance (cognitive social and cognitive non-social scales) and behavioural avoidance (behavioural social and behavioural non-social scales). Ottenbreit and Dobson (2004) conducted analysis using a large university sample, demonstrating high stability in its test-retest reliability ($r = 0.58-0.94$ for individual factors and

0.92 for overall scale) and moderate internal consistency ($\alpha = 0.75-0.86$ for individual factors and 0.91 for the total scale). In the current study, internal consistency was high for the behavioural subscales CBASBeh at pre-treatment ($\alpha = .90$) and post treatment ($\alpha = .92$) and also for cognitive subscales CBASCog at pre-treatment ($\alpha = .91$) and at post-treatment ($\alpha = .93$).

The Intolerance of Uncertainty Scale (IUS; Freeston, et al., 1994)

The IUS measures intolerance of uncertainty, a theoretical component underlying GAD. The original French version was translated into English (Buhr & Dugas, 2002). The 27-item self-report measure demonstrated adequate test re-test reliability at five weeks ($r = .74$) as well as excellent internal consistency ($\alpha = .94$). Significant overlap between the reported four factors in the IUS means that a total score is most commonly used (Antony, et al., 2001). The internal consistency for the current study was high for pre-treatment ($\alpha = .96$) and post-treatment ($\alpha = .96$) scores.

The Social Problem Solving Inventory-Revised Short Form (SPSI-R:S; D'Zurilla, et al., 2002)

The SPSI-R: S is a 25 item measure used to assess perceived problem solving including problem solving orientation and problem solving styles. The five component scales measure positive problem orientation, negative problem orientation, rational problem solving, impulsivity/carelessness style and avoidance style. Adequate internal consistency is demonstrated for the five individual scales as well as the overall score ($\alpha = .79-.83$). Good test-retest reliability at three weeks ($r = .74$) as well as adequate convergent validity was demonstrated (D'Zurilla, et al., 2002). There was moderate internal consistency for pre-treatment ($\alpha = .64$) and post-treatment ($\alpha = .63$) scores in the current study.

Data analysis

There were three broad aims to the data analyses: 1) Compare waitlist and treatment group data collected between the start and end of the 8 week intervention period. 2) Examine maintenance of treatment effects at 4 week follow-up. Combined data from the treatment group and participants from the waitlist group who completed active treatment after the 8 week intervention period was utilised for this analysis. 3) Determine predictors of treatment change among outcome measures. All statistical procedures were performed using SPSS 19.0. Tests of significance were 2-tailed and α was set at .05.

1. Analysis of Treatment Effects

Data from the treatment group (N: 25) and waitlist group (N: 24) were compared across eight weeks on a number of clinical and process measures.

Missing data

Due to an administrative error, two of the measures (PSWQ and GAD Q) were not sent to ten participants in the waitlist condition at Time 2 (post waitlist period), resulting in 2.5% of missing data overall. Listwise deletion of cases was considered unsuitable as it would considerably reduce the sample size and the power of the study (Schafer, 1999). To account for the missing data and the additional uncertainty they introduced, multiple imputation was conducted using SPSS for Windows Release 20. This procedure generates multiple simulated sets for each missing data point (Rubin, 1996). Results from analyses of each of the datasets were then pooled according to Rubin's (1996) rules for combining estimates and standard errors from multiple data sets. A final database was generated with existing and imputed data. For a detailed description of multiple imputation see Sinharay and colleagues (2001).

Outcomes for treatment versus waitlist group

A multi-level mixed linear model was conducted on the self-reported measures, which took into account the multiple observations for each participant (see Peugh & Enders, 2005) and was able to combine results based on the individual imputed data. Analysis was conducted on measures including the primary outcome measure (PSWQ), additional outcome measures (GAD Q IV, DASS-21 scales and WSAS) and process measures (CBAS Cog, CBAS Beh, IU and SPSI-R:S). Three demographic variables, gender, age and ethnicity correlated significantly with several dependant variables. Hence these variables were included as covariates in the main analyses. Test of simple effects were conducted when significant interactions between time and treatment were demonstrated. Effect size was calculated across time, within each treatment group and reported as Cohen's d. As the data presented were partly imputed, the mean and standard error statistics were described.

Test of clinical significance

Clinically significant change was calculated for the primary outcome measure (PSWQ) using the reliable change index (RCI; Jacobson & Traux, 1991) and criterion for clinical significance based post-test functioning within the range of the normal population (Jacobson, Follette, & Revenstorf, 1984). RCI greater than 1.96 are considered to be at a magnitude where the individual's change following intervention is statistically significant. The following formula is used: $RCI = (x_1 - x_2) / S_{diff}$ where x_1 = pre-treatment score, x_2 = post-treatment score.

2. Analysis of Maintenance of treatment

Data from the treatment group was combined with results from individuals who took up treatment following the end of their waitlist period (Tx:24, Wx:16). A total of 40 participants provided data at three time points: pre-treatment, post-treatment and 4-week

follow-up. Repeated measures ANOVA were conducted on the dependant measures. In each case where differences were found, simple pairwise comparisons was used to determine statistical significance.

3. Analysis of Predictors of Treatment Change

Bivariate correlations were analysed between change scores from pre-treatment to post-treatment on the process measures and PSWQ scores. To examine predictors for treatment change from among the measures of psychological processes, change scores on process measures were entered into a stepwise regression to predict the dependant variables of interest (post-treatment PSWQ and follow-up PSWQ scores).

Results

Descriptive and outcome data

The groups were compared on demographic descriptors using chi-square and one-way analysis of variance (ANOVA) to determine whether they differed on these variables at baseline. There were no significant differences between conditions for participant gender, age, marital status, ethnicity, education or employment (all p 's < .05). See Table 1 for breakdown of demographics based on treatment and waitlist condition as well as the combined data of all individuals who received active treatment.

Table 1. *Demographic data across conditions*

Demographic	BAW n=25	Waitlist n=24	Received Tx n=40
Sex,			
Female	68%	88%	75%
Male	32%	12%	25%
Age, years	36.48	42.17	39.30
(<i>SD</i>)	(12.30)	(13.11)	(13.51)
Marital status,			
Married	48%	38%	37.5%
Never married	28%	29%	32.5%
De facto	20%	8%	17.5%
Separated	4%	4%	5%
Divorced	-	21%	7.5%
Ethnicity,			
Anglo Australian	84%	71%	78%
Asian/Asian Australian	8%	12%	10%
European/Euro Australian	8%	17%	12.5%
Education			
High school	12%	13%	12.5%
Trade certificate or apprenticeship	4%	8%	7.5%
University	68%	62%	62.5%
Other	16%	17%	17.5%
Employment			
Employed (full and part time)	60%	63%	57.5%
Retired	8%	4%	7.5%
Full time home duties	12%	12%	12.5%
Unemployed	8%	4%	7.5%
Student (full time)	12%	17%	15%

Note: BAW = Behavioural Activation with Worry, Received Tx= include those in BAW and waitlist group who undertook treatment.

1. Analysis of Treatment Effects

Primary outcome measure

Table 2 shows the mean scores, standard errors and effect sizes for the Behavioural Activation with Worry treatment (BAW) and waitlist conditions on the PSWQ.

Table 2: Estimated marginal means and effect sizes of pre- treatment and post-treatment data across the two conditions

Measure	BAW (n=25)			Waitlist (n=24)		
	Time 1 Pre-treatment mean (SE)	Time 2 Post-treatment mean (SE)	Effect size	Time 1 Pre-treatment mean (SE)	Time 2 Post-treatment mean (SE)	Effect size
PSWQ	65.20 (1.87)	55.52 (1.87)	1.04(+)	65.61 (1.91)	64.06 (2.00)	0.16(+)
GAD Q IV	9.24 (.55)	6.69 (.55)	0.93(+)	10.86 (.56)	9.58 (.60)	0.45(+)
DASS Dep	16.32 (2.08)	11.84 (2.38)	0.40(+)	16.42 (1.82)	20.75 (2.12)	0.45(-)
DASS Anxiety	12.00 (1.55)	10.64 (2.20)	0.14(+)	14.92 (2.43)	17.67 (2.30)	0.24(-)
DASS Stress	21.92 (1.84)	17.60 (2.04)	0.45(+)	25.08 (1.97)	22.25 (2.05)	0.29(+)
WSAS	21.04 (1.45)	16.92 (1.61)	0.54(+)	22.92 (1.13)	21.67 (1.53)	0.14(+)
CBASBeh	37.84 (2.52)	33.32 (2.67)	0.35(+)	37.25 (2.50)	37.07 (2.32)	0.02(+)
CBASCog	46.32 (3.00)	39.88 (3.09)	0.42(+)	42.83 (2.64)	46.18 (3.42)	0.22(-)
IU	82.76 (4.31)	69.16 (3.91)	0.66(+)	82.44 (5.50)	84.04 (5.47)	0.06(-)
SPSI-R:S	9.80 (.40)	10.81 (.42)	0.49(-)	10.10 (.48)	9.84 (.27)	0.14(+)

Note: Within-group effect sizes are reported as Cohen's d; For all measures with exception of SPSI-R, reduction to scores = improvement in outcomes, for SPSI score, increase in score indicates improvement in outcome. Standard Errors (SE) are in parenthesis. BAW = Behavioural Activation for Worry; PSWQ = Penn State Worry Questionnaire; GAD Q IV = Generalised Anxiety Disorder Questionnaire IV; DASS = Depression Anxiety and Stress Scale; WSAS = Work and Social Adjustment Scale; CBASBeh= Cognitive Behavioural Avoidance Scale Behaviour subscale; CBASCog= Cognitive Behavioural Avoidance Scale Cognitive subscale; IU= Intolerance of Uncertainty questionnaire; SPSI-R:S= Social Problem Solving Inventory Revised Short Form; + positive direction effect size; - negative direction effect size.

From pre to post treatment, there was a non-significant main effect on the PSWQ for time, $F(1,47)=.43, p=.51$. The main effect of treatment group was significant, $F(1, 47)=14.98, p<.01$ as was the interaction between treatment and Time $F(1, 47)=17.07, p<.01$. Tests of simple effects revealed a significant reduction between Time 1 and Time 2 for the treatment group $B= 8.55, F(1,47)=10.43, p<.01$ but not for the waitlist group between Time 1 and Time 2, $B=1.55, F(1, 47)=.66, p=.42$. A non-significant difference was found between the treatment and waitlist group at Time 1, $B=.41, F(1, 47)=.02, p=.88$. . However there was a significant difference between the waitlist and treatment group at Time 2, $B=9.68, F(1,47)=28.62, p<.01$.

A test of clinical significance revealed that at the end of the treatment period, 56% of the BAW group had achieved clinically significant reductions in excessive worrying compared to 33% in the waitlist group.

Additional clinical measures

Mean scores, standard error rates and effect sizes of additional clinical measures can be seen in Table 2.

Mixed model analysis on the GAD Q failed to show a significant main effect of time $F(1, 47)=3.00, p=.08$. There was a significant main effect of treatment $F(1,47)=12.63, p<.01$, but the interaction between time and treatment was not significant, $F(1, 47)=1.58, p=.21$. At baseline, 80% of the BAW group met criteria for GAD compared to 96% of waitlist participants. The difference between the two groups at baseline was not significant $\chi^2(1, N=25)=2.86, p=.09$. Of the BAW group participants who had met criteria at baseline, 55% no longer met criteria at the end of treatment. This is compared to no change in the waitlist group. The difference at the end of the treatment period between the two groups was significant $\chi^2(1, N=24)=13.62, p<.01$.

Mixed model results for the DASS depression subscale also failed to show a significant main effect for time $F(1, 47)=3.00, p=.09$ or treatment $F(1,47)=.00, p=.96$. However, there was a significant treatment by time interaction $F(1,47)=9.11, p<.01$. Tests of simple effects showed that the two groups did not differ significantly at Time 1, $B=.10, F(1,73)<.01, p=.97$, but did differ significantly at Time 2, $B=8.91, F(1,73)=8.87, p<.01$. Participants in active treatment showed a significant decrease in depression between Times 1 and 2, $B=4.48, F(1,47)=4.90, p=.03$, while those on waitlist significantly increased their depression over time, $B=4.33, F(1, 47)=4.28, p=.04$. The DASS anxiety subscale did not show significant main effects for time $F(1, 47)=.19, p=.67$, treatment $F(1, 47)=3.76, p=.06$ nor a significant interaction on the two factors $F(1, 47)=.19, p=.21$. The DASS stress subscale

indicated a significant main effect over time $F(1,47)=5.47, p=.02$. However, the treatment main effect was not significant, $F(1, 47)=.24, p=.10$, and neither was the interaction between the two factors $F(1,47)=2.78, p=.63$.

Life functioning measured by WSAS revealed significant main effects for time only $F(1,47)=5.91, p=.02$. There was no significant main effect for treatment $F(1,47)=3.70, p=.06$, nor a significant treatment by time interaction, $F(1,47)=1.69, p=.20$.

Process measures

Mean scores, standard error rates and effect sizes of process measures are presented in Table 2.

There was a significant main effect reduction in CBASBeh score over time $F(1,47)=4.11, p=.05$. However, the main effect for treatment group did not reach significance, $F(1, 47)=.22, p=.64$, and neither did the treatment by time interaction, $F(1, 47)=4.11, p=.07$. For the CBASCog, both the main effects for time, $F(1,47)=.76, p=.39$, and treatment, $F(1,47)=.13, p=.72$ failed to reach significance, but there was a significant interaction between treatment over time $F(1,47)=7.67, p=.01$. Tests of simple effects on CBASCog data demonstrated non-significant differences between waitlist and treatment groups at Time 1, $B=6.30, F(1, 65)=2.15, p=.15$, and no significant change for the waitlist group between Time 1 and Time 2, $B=3.35, F(1, 47)=1.76, p=.19$. Surprisingly the difference between the treatment and waitlist groups at Time 2 also failed to reach significance, $B=3.49, F(1, 65)=.66, p=.42$, but there was a significant reduction in scores on the CBASCog in the treatment group between Time 1 and Time 2, $B=6.44, F(1, 47)=6.78, p<.01$.

From pre to post treatment, a statistically significant main effect was found for the IU scale on time $F(1,47)=7.96, p=.01$. However the treatment main effect was not significant for treatment group $F(1,47)=1.26, p=.27$. Nevertheless, there was a significant interaction

between treatment and time, $F(1,47)=12.80, p<.01$. Tests of simple effects revealed no significant difference between groups at Time 1, $B=.32, F(1,56)<.01, p=.96$, but the groups did differ significantly at Time 2, $B=14.88, F(1, 56)=4.75, p=.03$. Further the treatment group significantly reduced on IU over time, $B=13.6, F(1, 47)=20.89, p<.01$, while the waitlist showed no significant difference between Time 1 and Time 2, $B=1.60, F(1,47)=.28, p=.60$.

Mixed model analyses for the SPSI-R:S failed to demonstrate significant main effects with time $F(1,47)=1.63, p=.21$, or treatment, $F(1,47)=.51, p=.48$. However there was a significant interaction of treatment by time $F(1,47)=4.28, p=.044$. Tests of simple effects failed to demonstrate a significant difference between the treatment and waitlist groups at Time 1, $B=.97, F(1, 80)=2.95, p=.09$, or at Time 2, $B=.29, F(1,80)=.27, p=.61$. Similarly the waitlist group failed to show a significant change between Time 1 and Time 2, $B=.24, F(1, 47)=.31, p=.58$. However, a significant change was found for the treatment group between Time 1 and Time 2. $B=1.02, F(1, 47)=5.71, p=.02$.

2. Analysis of Maintenance of treatment

Demographic data for this larger sample with all participants who received BAW are presented in Table 1.

As can be seen in Table 3, scores reduced significantly from pre-treatment to post treatment and continued to reduce at four weeks follow-up for measures of GAD Q and WSAS. Several dependant measures reduced significantly from baseline to post-treatment and were maintained at follow-up. These included PSWQ, CBASBeh, CBASCog, IU and SPSI-R:S. For the DASS measures of depression, anxiety and stress, the changes across the three time points were not significant.

Table 3. Estimated marginal means across three time points for participants who received Behavioural Activation for Worry treatment

Measure	Pre-treatment mean (SE)	Received BAW treatment (n=40)		Tests of significance
		Post-treatment mean (SE)	Follow-up mean (SE)	
PSWQ	65.20 (1.40) ^a	57.54 (1.66) ^b	56.50 (1.78) ^b	F(1, 63)=16.52, p<.01*
GAD Q IV	9.75 (.42) ^a	7.60 (.57) ^b	5.83 (.60) ^c	F(2, 78)=21.77, p<.01*
DASS Dep	18.4 (2.02) ^a	13.82 (1.83) ^a	15.25 (1.86) ^a	F(1, 57)=2.74, p=.09
DASS Anxiety	13.75 (1.60) ^a	12.35 (1.72) ^a	12.74 (1.71) ^a	F(2,78)=.39, p=.68
DASS Stress	23.80 (1.53) ^a	19.90 (1.71) ^a	20.45 (1.75) ^a	F(2, 78)=2.63, p=.08
WSAS	22.00 (1.07) ^a	17.75 (1.19) ^b	15.03 (.95) ^c	F(2, 78)=24.07, p<.01*
CBASBeh	38.35 (1.91) ^a	33.66 (1.95) ^b	31.45 (1.86) ^b	F(1, 66)=11.57, p<.01*
CBASCog	45.13 (2.21) ^a	40.00 (2.12) ^b	37.00 (2.21) ^b	F(2,78)=9.51, p<.01*
IU	84.58 (3.41) ^a	73.18 (3.52) ^b	69.45 (3.80) ^b	F(2, 78)=17.33, p<.01*
SPSI-R:S	9.89 (.34) ^a	10.73 (.34) ^b	10.76 (.40) ^b	F(2, 78)=5.72, p=.01*

Note: *significant results, p<.05, sharing superscripts (^a, ^b, ^c) means scores are not significantly different at p<.05. Reduced scores indicate improvement in all measures with exception of SPSI-R:S where increased score indicate improvement.

3. Analysis of Predictors of Treatment Change

Table 4 presents bivariate correlations between change scores from pre-treatment (T1) to post-treatment (T2) on the process measures and PSWQ scores. Changes in measures on the CBASBeh showed the most consistent relationships with PSWQ at post treatment and at follow-up.

In each case, baseline scores on the PSWQ were entered into the regression first. A stepwise regression to predict post-treatment PSWQ revealed that the best predictor of post-treatment PSWQ score was the pre-treatment PSWQ ($B=.56$, $t=3.63$, $p<.01$). After controlling for pre-treatment PSWQ, CBASBeh predicted a further 11% of the variance in post-treatment PSWQ ($B=-.39$, $t=-2.63$, $p=.01$). When follow-up PSWQ score was used as the dependent variable and pre-treatment PSWQ was entered first, it failed to predict significant variance in the overall model. When the remaining variables were entered, the overall model accounted

for 30% of the variance ($B=43.02$, $t=3.61$, $p<.01$). Significant individual predictors were CBASBeh ($B=-.64$, $t=-2.81$, $p<.01$) and SPSI-R:S ($B=2.7$, $t=2.76$, $p<.01$).

Table 4: Correlations between process measures change scores with PSWQ

Score	T3PSWQ	T2PSWQ	T1PSWQ	Cog	<u>Change scores</u>		SPSI:R
					Beh	IU	
T3 PSWQ	-	.67*	.24	-.10	-.39*	-.10	.37*
T2 PSWQ	-	-	.53*	-.27*	-.42*	-.16	.12
T1 PSWQ	-	-	-	-.08	-.17	-.05	-.06
<u>Change scores</u>							
Cog change	-	-	-	-	.64*	.46*	-.12
Beh change	-	-	-	-	-	.43*	-.10
IU change	-	-	-	-	-	-	-.26
SPSI-R:S	-	-	-	-	-	-	-

Note: T3: PSWQ follow-up score; T2: PSWQ post score, T1: PSWQ pre score; *Significant result, $p<.05$,

Discussion

Results from the present study support the conclusion that BAW is an effective transdiagnostic treatment for people reporting excessive worry. However, the sample in this trial was still relatively small and there are a number of limitations with the design. Hence reliability of results needs to be understood in the context of these limitations. Taking into consideration the limited sample size and power, the study provided promising support for BAW in comparison with a waitlist control on the majority of clinical and process measures. Almost twice the number of participants in the BAW group compared to the waitlist group showed clinically significant reductions in the primary outcome measure of excessive worry. These impressive results were supported by evidence that over half of those in BA group who were diagnosed with GAD at baseline had lost their diagnosis at the end of the eight week treatment. Further, GAD symptomatology and life interference continued to reduce significantly following the end of treatment. BAW was also found to be effective in reducing

depressive symptoms when compared to the waitlist group. Surprisingly, however, when a combined sample of all participants who received treatment was taken into account, the improvements on depression were no longer significant. Measures of somatic symptoms and stress scores using the DASS did not yield significant results. It is unclear why scores on this particular measure showed the least promising results, but they do temper the conclusions and support the need for replication with larger samples. Mixed model analysis results behavioural avoidance, cognitive avoidance and problem solving were not significant. However the interaction between treatment and time was significant for intolerance of uncertainty. Further, changes in behavioural avoidance at post treatment were found to be the best predictor of reduced worry at end of treatment.

Results from the current study build on preliminary pilot research by Liu and colleagues (2012b) supporting the use of BAW for individuals experiencing excessive worry. The use of a waitlist control group, specific questionnaires to measure avoidance and a brief follow-up data point addressed several limitations of the previous pilot study. In addition, the current study adds to a small existing body of literature that attempts to extend the use of BA to diagnostic groups beyond depression (Armento & Hopko, 2009; Chu, et al., 2009; Mulick & Naugle, 2004; Turner & Leach, 2009, 2010)

Previous studies have demonstrated that BA is an effective treatment for co-occurring depression and anxiety (Chu, et al., 2009; Turner & Leach, 2009, 2010). In the present study, there was robust evidence supporting BAW as an effective treatment for excessive worry, and partial support for the treatment for depression and anxiety symptomatology. Effect size change from the current study was particularly large for the primary outcome measure of excessive worry- 1.04 for PSWQ, as well as for GAD symptomatology - 0.93 for GAD Q IV. This compares favourably to a meta-analysis of CBT and pharmacological treatment for GAD where Gould and colleagues (1997) reported an overall effect size of .70 for CBT treatment and .60 for pharmacology. However, depression symptom reduction was not as

marked as reduction in worry and GAD symptoms using BAW. The effect size reduction in depression symptoms($d=.40$) at post treatment was also below the overall effect size of .70 reported in a meta-analysis of behavioural activation treatment for depression (Ekers, Richards, & Gilbody, 2008). This result may indicate that a treatment targeting worry may in fact be more effective in reducing anxiety than depression. Whilst worry is said to elicit anxiety and depression in equal parts in non-clinical populations (McLaughlin, et al., 2007), there may be distinct differences within samples of excessive worriers. Alternately, this result may simply reflect a floor effect due to the moderate depression scores reported by participants in the current study, which are considerably lower than those of participants in most studies of BA for depression (Ekers, et al., 2008).

An interesting result which emerged from this study was the marked improvement in life functioning and in related processes such as avoidance, intolerance of uncertainty and problem solving orientation. One of the proposed pathways of change in behavioural activation is to target patterns of avoidance and problem orientation through increases in goal orientated behaviours, resulting in greater problem resolution (Dimidjian, et al., 2011; Jacobson, et al., 2001; Martell, Dimidjian, & Herman-Dunn, 2010). Increases in goal orientated behaviours are also likely to enhance problem solving confidence (Behar, et al., 2009). While this may lead to improved functioning across multiple life domains, individuals may not experience immediate symptom relief. By explicitly guiding individuals to use their worry and internal experiences as a cue to enact goal orientated behaviours (Addis & Martell, 2004), there is a shift of motivation away from attempts to control aversive internal experiences such as anxious and depressive symptomatology and towards increasing goal orientated actions (Roemer & Orsillo, 2002). In doing so, individuals are able to experience greater life functioning with reduced symptomatology as a by-product over a period of time.

To our knowledge, BAW is the first intervention that aims to systematically target behavioural avoidance to treat excessive worrying, a key component across emotional

disorders (Brosschot, et al., 2006; Stanley & Gibson, 1985). Evidence based treatments for excessive worrying have primarily focused on tackling the cognitive avoidance component (Behar, et al., 2009; Borkovec, et al., 1998). Increasingly clinicians have identified evidence of behavioural avoidance among excessive worriers (Beesdo-Baum, et al., 2012; Coleman, et al., 2011), highlighting the need for a treatment which adequately addresses behavioural components. Results from the present study support this claim by demonstrating that change in behavioural avoidance was the best predictor of long term excessive worry, followed by a change in problem solving orientation. Together with Liu and colleagues' (2012a) maintenance model of worry, this study proposes that behavioural avoidance may not only be a consequence of worry, but may also play a key role in its cause. Future studies will benefit from further exploration of the extent of this causal role.

In addition to theoretical interest, BAW also presents pragmatic benefits for public mental health. The comparative efficacy of BA and full packaged CBT has been supported by several meta-analyses which demonstrated equivalent results in post treatment and follow up for depression (Ekers, et al., 2008; Mazzucchelli, Kane, & Rees, 2009; Sturmey, 2009). Considering that the interventions choices in BA are fewer and more clear-cut, BA presents as a parsimonious form of psychotherapy (Christensen & Jacobson, 1993). Due to the very applied and practical nature of tackling behavioural avoidance (Ekers, et al., 2011), BAW may also benefit individuals who have difficulty with the abstract nature of cognitive therapy. Extending this approach to a transdiagnostic model that addresses emotional disorders, there is even greater potential to add further practical benefit. An effective BAW would vastly benefit service provision considering the current level of therapist scarcity and overwhelming demand for mental health services.

Several limitations in the study need to be considered in detail. The principal limitation was the missing data for a significant proportion of the waitlist participants on two key measures. Data were obtained on several measures for these participants allowing us to

impute the missing data, however, in turn, multiple imputation is likely to have reduced statistical power (Haukoos & Newgard, 2008). Nevertheless, lower power is likely to reduce the opportunities to observe statistical difference. Secondly, the reliance on self-reported measures may be subject to distortions in reporting of behavioural changes and symptoms. Particularly in the case of a behavioural intervention such as BAW, the focus of the intervention is in the environmental changes such as increases in activities or resolution of long standing avoidance (Dimidjian, et al., 2011). Hence future studies may benefit from inclusions of behavioural measures, reports from significant others, or other independent measures of activation. Another consideration to take into account is the short follow-up period. As most clinical studies tend to include follow-up periods of 6-12 months, this limits the generalizability of long term treatment effects of BAW. As the rate of reduction following treatment completion may vary for symptom versus process changes, future studies will benefit from examining these differences with longer follow-up periods using a longitudinal design.

With these limitations in mind, the overall pattern of results suggests that BAW shows promise as an effective transdiagnostic treatment for individuals experiencing excessive worry. Further research with larger sample sizes is needed to establish the specificity of effect, particular with regard to the mechanisms responsible for change. Clinical implications for BAW include ease of dissemination, brief professional training and an alternative to language focused treatment which may benefit individuals who do not respond to traditional CBT.

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CHAPTER FIVE

GENERAL DISCUSSION

Summary of Results

The aim of this thesis was to explore the role of behavioural avoidance in excessive worry and whether targeted treatment of behavioural avoidance can alleviate distress and impairment in excessive worriers. In order to achieve these aims, three studies were conducted that examined a model of worry, completed a pilot study applying behavioural activation treatment targeting behavioural avoidance and finally, conducted a randomised controlled trial comparing behavioural activation to worry compared to waitlist control.

The study reported in Chapter two tested a model of excessive worry incorporating relationships with avoidance and problem solving orientation using a large university student population. The study demonstrated that while worry has a direct relationship with emotional distress, there is also an indirect relationship through problem solving orientation, cognitive avoidance and behavioural avoidance. The study was consistent with previous studies supporting the role of problem solving orientation (Dugas, et al., 1997) and cognitive avoidance (Borkovec & Roemer, 1995) as factors which maintain distress and anxious symptomatology. However, little is known about the direct and indirect relationship these factors have with behavioural avoidance. Clinical reports suggest that behavioural avoidance acts to impair functioning and may hinder treatment outcome in excessive worriers (Beesdo-Baum, et al., 2012; Hazlett-Stevens, 2008). Findings from the study in Chapter two support these reports and suggest that engagement in overt behavioural attempts to control or prevent worrying contribute to the likelihood that worriers will experience emotional distress. What has not been previously substantiated but was found in the current study, was evidence that engagement in cognitive avoidance and poor problem solving orientation will lead to distress only if worriers also engage in behavioural avoidance. This is demonstrated by the lack of direct paths between problem solving orientation and cognitive avoidance with emotional distress, but rather an indirect relationship through behavioural avoidance.

Based on the findings from Chapter two, an intervention which has a conceptual fit to target behavioural avoidance in excessive worry was proposed. The study described in the third chapter examined an initial effort to adapt behavioural activation treatment (Jacobson, et al., 2001) to a group format suitable for excessive worriers. Behavioural Activation for Worry (BAW) was a seven week group based treatment. At baseline, all seven participants met criteria for Generalised Anxiety Disorder (GAD) and experienced high levels of excessive worry. Individuals also experienced additional co-morbid anxiety and mood disorders. At the end of the treatment, 43% demonstrated clinically significant change to scores of excessive worry and 57% no longer met criteria for GAD. These results compared favourably to CBT treatment for GAD, where only about half the number of sufferers return to normal levels of anxiety and functioning (Borkovec & Whisman, 1996). Despite the fact that the treatment did not specifically target depression, all but one participant reported reductions in depressive symptomatology. Whilst the results were preliminary, they do suggest that BAW may be a feasible treatment across multiple anxiety and mood disorders.

Considering the preliminary results supporting the use of BAW with excessive worriers, the fourth and final chapter examined the efficacy of BAW within a randomised control trial with 49 individuals experiencing high levels of excessive worry. Self-report measures were used in the assessment where participants scored moderate to high scores on a range of clinical measures of depressive and anxious symptomatology. Large effect size reductions were seen in excessive worry, GAD criteria and life impairment. Twice as many individuals showed clinically significant change in the treatment group compared to the waitlist group. Further, 55% of individuals who were diagnosed with GAD in the treatment group at baseline were diagnosis-free at the end of the treatment, compared to 0% of those diagnosed with GAD in the waitlist group. Results from the study support the use of BAW as a transdiagnostic treatment for anxiety symptomatology. Results were mixed for the use of BAW for depression symptomatology. Regression results also compared several process

measures including behavioural avoidance, cognitive avoidance, problem solving orientation and intolerance of uncertainty. Results were inconsistent with maintenance theories of intolerance of uncertainty (Dugas, et al., 1998) as intolerance of uncertainty did not appear to predict worry at post treatment or follow-up. Rather, a change in behavioural avoidance was the best predictor of excessive worry at four week follow-up, followed by problem solving orientation.

Theoretical implications

This thesis has important theoretical implications for how worry and behavioural avoidance may impact on GAD symptoms, distress and impairment. Previous models of worry and GAD have largely focused on the role of cognitive avoidance (Behar, et al., 2009) in maintaining GAD symptomatology. In particular, Borkovec's Avoidance Model of Worry and GAD (Borkovec, 1994; 2004) describes worry as a thought based activity, which act as an avoidance response to suppress somatic anxiety. According to this theory, cognitive avoidance prevents the deep emotional processing of aversive thoughts and images necessary for successful fear extinction (Foa & Kozak, 1986). Results from the current study add to this theory with evidence to suggest worry is not only a cognitive avoidance response but may also have a behavioural avoidant function. Whilst previous studies have argued that behavioural symptoms were manifestations of cognitive avoidance (Borkovec, 1994), our results would suggest a more causal role at work. Further, it seems that it is not only necessary that worriers experience avoidant thoughts about problematic situations or stimuli but it may be the act of overtly avoiding physical engagement which predicts the high levels of distress and impairment in worriers.

Clinical implications

Previous treatments for GAD and excessive worry have focused strongly on cognitive approaches within the CBT tradition (Behar, et al., 2009). However, only half of the clients

treated with such presenting problems respond to this treatment modality (Borkovec, 2002; Roemer & Orsillo, 2002). This acknowledgement of poor treatment outcome has led to a recent interest in new forms of treatment for GAD and pathological worry. The current treatment intervention draws from clinical evidence of behavioural avoidance in excessive worriers and the impact of these behavioural symptoms on treatment outcome in GAD (e.g.; Beesdo-Baum, et al., 2012; Hazlett-Stevens, 2008). The treatment intervention proposed in the current thesis is the first theoretically grounded behavioural focused treatment for excessive worriers, specifically targeting behavioural avoidance. Whilst behavioural avoidance in the form of safety behaviours are addressed in clinical manuals (Andrews, et al., 1994; Hazlett-Stevens, 2008), extended evaluation of these strategies in treatment outcome studies has yet to be completed. A greater understanding of the behavioural symptoms in excessive worriers as well as applications of treatment intervention is likely to lead to improved treatment outcome.

Currently, GAD is the only anxiety disorder in the DSM IV which does not feature behavioural symptoms as part of its criteria (American Psychiatric Association, 1994). Behavioural attempts to control and/or prevent worry as mentioned in the previous section are prolific in excessive worriers. Beesdo-Baum and colleagues (2012) argue that considering the clinical evidence, behavioural symptoms are as relevant to GAD as other symptoms such as physical symptoms and engagement in excessive/uncontrollable worry. Despite the limited data on the possible causal role of these manifest behaviours, behavioural symptom criteria were suggested in the recent proposal of changes to the DSM 5 criteria for GAD (Andrews, et al., 2010). Acknowledgment of the important role that behavioural avoidance plays in the maintenance of anxiety symptomatology is likely to facilitate improved diagnosis and assist the development of more effective treatments.

Implications for public health

In recent years, a stepped care approach featuring graded access to mental health services using a combination of low and high intensity interventions has been discussed across primary health care providers (National Institute for Clinical Excellence, 2005). The graded access model stipulates that individuals are provided with the least restrictive intervention appropriate to their problems and are facilitated within the health care system to step up based on their needs (Ekers, Lovell, & Playle, 2006). The BAW is a clinical intervention which is benchmarked as equivalent to traditional approaches such as CBT but is more parsimonious in the training of professionals and treatment dissemination (Ekers, et al., 2006). A recent community study expanded this parsimony idea further (Ekers, et al., 2011). In this study, qualified mental health nurses with no previous formal psychotherapy training or experience were provided five days of intensive behavioural activation training and subsequent fortnightly clinical supervision. Following this, they delivered a structured 12 session protocol of behavioural activation for depression with adults from a primary care mental health setting who were diagnosed with depression. Compared to a control group who continued to receive treatment as usual (i.e. follow-up with family doctor), clinically significant results in the BA group were double that seen in the control group. This ease of training and delivery is likely due to the applied and relatively concrete nature of BA, particularly when compared to the abstract language-based focus of cognitive therapy (Hofmann & Asmundson, 2008). The results of the Ekers et al study (2011) suggest that BAW could be more easily disseminated to mental health practice settings than traditional CBT approaches.

In addition to the parsimony argument favouring Behavioural Activation treatment, the transdiagnostic approach of BAW also adds further value within the public health setting. Transdiagnostic treatment interventions recognise the high levels of comorbidity between the emotional disorders for individuals presenting in primary health settings (Kessler, et al., 2005;

Zimmerman, et al., 2000). They also acknowledge the mismatch with the proliferation of disorder specific evidence based treatment protocols available (Ellard, et al., 2010). Transdiagnostic treatments are able to target shared pathological processes across multiple emotional disorders (Clark & Taylor, 2009). BAW specifically targets the process of worry which is found consistently to bridge across multiple emotional disorders including depression and anxiety and serve to maintain functions of distress and impairment (Hong, 2007; McLaughlin, et al., 2007; Segerstrom, et al., 2000; Watkins, 2008). The transdiagnostic approach of BAW allows assessment, training and treatment to focus on the key maintaining process of excessive worry, rather than the need to gather up diagnostic information and dividing up services on this basis (Mansell, et al., 2009). This affords a substantial benefit to dissemination into clinical practice and reduced training needs for mental health care providers. However, despite the potential utility of a transdiagnostic approach to mental disorders, research into transdiagnostic treatment protocols is still in its infancy and therefore requires further attention (McEvoy, et al., 2009).

Implications for treatment with specific groups

Treatment interventions (including Cognitive Behavioural Therapy and Cognitive Therapy) which require a high degree of abstract discussion often come with a disadvantage for individuals with limited verbal ability or poor psychological mindedness, particularly in relation to understanding emotions and the mediating role of cognitions (Willner, 2006). The use of cognitive therapy techniques with populations who display poor literacy and intellectual disability has been widely criticised and some evidence suggests that more behaviourally orientated treatments are more effective with these populations (Sturmey, 2004). Considering that the intervention choices in BA are fewer and more clear-cut, BA also opens up the possibility for cheaper alternatives to intensive psychotherapy which may also be of value to individuals who have previously experienced difficulties with the abstract nature of cognitive challenging in CBT and Cognitive Therapy (Ekers, et al., 2008).

Research into appropriate therapeutic frameworks for cross-cultural client groups have found that directive, structured and short-term treatment is more effective in treatment outcome than non-directive person-centred approaches (Chu, 1999). Within western countries with high levels of immigration such as Australia and the USA, immigrants with mental health difficulties are often left with limited options of mental health services delivered in their own language (Leong & Kalibatseva, 2011; Stolk, Minas, & Klimidis, 2008). When delivering treatment to immigrants from Non English Speaking Background (NESB), it is likely that the applied and structured nature of BAW will be of benefit. Results from the pilot study in Chapter three demonstrated that BAW was able to accommodate a diverse client group with almost half the number of participants for whom English was their second language. As the population in the randomised control study in Chapter four did not feature many NESB participants, this possible benefit needs to be replicated with an appropriate sample.

Limitations and improvements

There are several noteworthy limitations of the studies in this thesis mainly dealing with issues of sampling and adherence to strict clinical guidelines. Firstly, the use of a cross-sectional student population to test a model of excessive worry limited conclusions regarding generalizability and causality. Future research will benefit to examine the issue with a clinical sample through a longitudinal design or through the use of experimental designs. Secondly, by using a sample of convenience from participants who volunteered for research around a university campus to test BAW, this naturally produced several limitations related to the generalizability of the sample. For example, the sample did not represent a broad cross-section of socio-economic representation, ethnic diversity or education level. Therefore future studies need to be replicated with a broader and larger community sample. A longer period of follow-up may also reveal further changes in pathology. Finally, the study also did not undertake several of the recommendations from the randomized clinical trials Consolidated

Standards of Reporting Trials (CONSORT) reporting guidelines (Altman et al., 2001; Moher, Schulz, & Altman, 2001) such as appropriate blinding of facilitators to treatment condition and performing treatment adherence assessments. To further strengthen the empirical status of BAW, it should be compared to an active control treatment within a randomised controlled trial that includes a larger and more heterogeneous sample, and adheres to the CONSORT guidelines.

Future directions

This research provides a strong foundation for the consideration of behavioural avoidance in excessive worry. Whilst this thesis has discussed the benefits of transdiagnostic interventions at length, these results also provide clinical relevance to the understanding of Generalised Anxiety Disorder (GAD). This also has significant implications to the ongoing debates regarding the inclusion of behavioural symptom criteria to DSM 5 GAD criteria (Andrews, et al., 2010). Further investigation, using a longitudinal design, of behavioural symptoms and their role in the maintenance of anxiety and worry will be a vital extension of this work.

The utility of transdiagnostic interventions have also been discussed at length. As the rate of recovery in the current transdiagnostic model is comparable to that of CBT treatment for GAD, the current findings further support the treatment value of transdiagnostic interventions. However, direct comparisons cannot be made due to the use of a waitlist control in the current study. Replications comparing BAW to active CBT or CT treatment would be of great clinical interest.

Concluding remarks

Overall, the current thesis provides a strong insight into the role of behavioural avoidance in excessive worry as well as the application of a treatment focused on behavioural

avoidant symptoms in excessive worriers. While previous studies of excessive worry have primarily focused on cognitive avoidance, evidence in the current thesis suggests that behavioural avoidance plays a direct role to facilitate distress and impairment. It is from this evidence base that a treatment application targeting behavioural strategies is derived. In addition, the utility of transdiagnostic interventions informed by high levels of comorbidity across emotional disorders and evidence of shared common processes allows treatment applications to carry greater pragmatic value. Hence a behavioural activation treatment which targets worry, a common process which overlaps emotional disorders, provides additional value to treatment dissemination. If replicated across longer time periods with larger clinical samples, Behavioural Activation for Worry will have substantial implications for effective evidence based treatment for emotional disorders.

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Final ethics approval

Ethics application reference- 5201000698- Final Approval

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Ethics Secretariat

8/4/10



to Prof, me

Dear Prof Rapee

Re: "The effectiveness of behavioural activation treatment with high worriers"

Thank you for your recent correspondence. Your response has addressed the issues raised by the Human Research Ethics Committee and you may now commence your research.

The following personnel are authorised to conduct this research:

Dr Junwen Chen & Ms Xi Liu- Co-Investigators
Prof Ron Rapee- Chief Investigator

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).
2. Approval will be for a period of five (5) years subject to the provision of annual reports. Your first progress report is due on 04th August 2011.

If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

<http://www.mq.edu.au/policy/>

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

If you need to provide a hard copy letter of Final Approval to an external organisation as evidence that you have Final Approval, please do not hesitate to contact the Ethics Secretariat at the address below.

Please retain a copy of this email as this is your official notification of final ethics approval.

Yours sincerely
Dr Karolyn White
Director of Research Ethics
Chair, Human Research Ethics Committee



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