Treatment of pathological worry in children with ‘third wave’ behavioural therapy and a multisensory learning model: a pilot study

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STATEMENT OF AUTHENTICATION

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

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Richard Meagher
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<table>
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<th>Description</th>
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<tbody>
<tr>
<td>ABBT</td>
<td>Acceptance Based Behavioural Therapy</td>
</tr>
<tr>
<td>ABM</td>
<td>Acceptance Based Model of Worry</td>
</tr>
<tr>
<td>ACT</td>
<td>Acceptance and Commitment Therapy</td>
</tr>
<tr>
<td>AFQ-Y</td>
<td>Avoidance and Fusion Questionnaire for Youth</td>
</tr>
<tr>
<td>AMW</td>
<td>Avoidance Model of Worry</td>
</tr>
<tr>
<td>APA</td>
<td>American Psychological Association</td>
</tr>
<tr>
<td>APS</td>
<td>Australian Psychological Society</td>
</tr>
<tr>
<td>CAMM</td>
<td>Child Acceptance and Mindfulness Measure</td>
</tr>
<tr>
<td>CBASP</td>
<td>Cognitive Behavioral Analysis System of Psychotherapy</td>
</tr>
<tr>
<td>CBT</td>
<td>Cognitive Behavioural Therapy</td>
</tr>
<tr>
<td>DBT</td>
<td>Dialectical Behavior Therapy</td>
</tr>
<tr>
<td>DCT</td>
<td>Dual Coding Theory</td>
</tr>
<tr>
<td>FAP</td>
<td>Functional Analytic Psychotherapy</td>
</tr>
<tr>
<td>IBCT</td>
<td>Integrative Behavioral Couple Therapy</td>
</tr>
<tr>
<td>ILS</td>
<td>Inventory of Learning Styles</td>
</tr>
<tr>
<td>IUM</td>
<td>Intolerance of Uncertainty model</td>
</tr>
<tr>
<td>MABIS</td>
<td>Mindfulness- and Acceptance-based Interventions</td>
</tr>
<tr>
<td>MAGT</td>
<td>Mindfulness- and acceptance-based group therapy</td>
</tr>
<tr>
<td>MBSR</td>
<td>Mindfulness Based Stress Reduction</td>
</tr>
<tr>
<td>MCBT</td>
<td>Mindfulness based Cognitive Behavioural Therapy</td>
</tr>
<tr>
<td>MRI</td>
<td>Magnetic Resonance Imaging</td>
</tr>
<tr>
<td>OT</td>
<td>Occupational Therapist</td>
</tr>
<tr>
<td>PSWQ-C</td>
<td>Penn State Worry Questionnaire – Child</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised Controlled Trial</td>
</tr>
<tr>
<td>RFT</td>
<td>Relational Frame Theory</td>
</tr>
<tr>
<td>SCAS-C</td>
<td>Spence Children’s Anxiety Scale – Children’s version</td>
</tr>
<tr>
<td>SCAS-P</td>
<td>Spence Children’s Anxiety Scale – Parent version</td>
</tr>
<tr>
<td>SDQ</td>
<td>Strengths and Difficulties Questionnaire</td>
</tr>
<tr>
<td>VARK</td>
<td>Visual, Aural, Read/write, and Kinesthetic</td>
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ABSTRACT

One purpose of the present research was to investigate the efficacy of a ‘third wave’ Acceptance Based Behavioural Therapy (ABBT) in reducing worry and symptoms of anxiety in children. A second purpose was to investigate the efficacy of incorporation of a multisensory learning model into treatment. A multisensory learning model introducing kinesthetic, visual, and tactile stimulus was hypothesized to increase treatment outcomes of an ABBT. It was also hypothesized that reduction in reported levels of anxiety and worry would be associated with both a reduction in measures of experiential avoidance and fusion, and an increase in measures of acceptance and mindfulness. ‘Third wave’ anxiety treatment approaches have shown promise with adult populations but have been scarcely used with child populations (Swain, 2013).

Two variations of an Acceptance Based Behavioural Therapy were administered over 8 weeks to children between 7-11 years of age. One ABBT treatment condition incorporated the multisensory learning model. A second ABBT treatment condition did not incorporate the multisensory learning model. Measures of symptomology were measured both pre-treatment and post-treatment.

Worry was measured by administration of the Penn State Worry Questionnaire – Child Adaptation (PSWQ-C) to participants. Symptoms of anxiety were measured by administration of both child report and parent report versions of the Spence Children’s Anxiety Scale (SCAS). Parents were also administered the Strengths and Difficulties behavioural screening questionnaire (SDQ). Mindfulness was measured by the Child Acceptance and Mindfulness Measure (CAMM). Experiential avoidance and cognitive fusion was measured by the Avoidance and Fusion Questionnaire for Youth (AFQ-Y). Anecdotal information about the parent’s experience of the treatment program was
collected via distribution of a parent treatment evaluation form. Primary outcome variables of the research were the PSWQ-C and the child version of the SCAS.

Measures of children’s anxiety and worry by the parent version of the SCAS and PSWQ-C were significantly reduced with small- moderate and moderate-large effect sizes respectively. Inclusion of the multisensory learning model did not reveal significant differences in treatment outcome. Qualitative data indicated that the multisensory learning model was valued by parents as effective in helping their children understand concepts of acceptance, defusion, and meta-cognition. Surprisingly, treatment effects were not associated with decreases in measures of experiential avoidance and fusion, nor increases in measures of acceptance and mindfulness.

Implications of the research are discussed including the efficacy of third wave behaviour therapy with children, clinical application of the therapeutic learning model, and considerations regarding measurement of experiential avoidance, fusion, acceptance, and mindfulness in young children.
CHAPTER 1 - INTRODUCTION

Anxiety disorders can have a significant impact on the lives of affected children (APA, 2013). In addition to causing distress, anxiety disorders in childhood are associated with low self-esteem, impaired social functioning, difficulties with concentration, and poor school performance (Ialongo, Edelson, Werthamer-Larsson, Crokett, & Kellam, 1996; Somers, Goldner, Waraich, & Hsu, 2006; Strauss, Frame, & Forehand, 1987). Anxiety disorders also affect a large number of children. Studies suggest that upwards of 10% of children and adolescents will have an anxiety disorder at any one time (For a review see Beesdo, Knappe, & Pine, 2009). There are a variety of types of childhood anxiety disorders. One is Generalized Anxiety Disorder (APA, 2013).

The central feature of Generalized Anxiety Disorder (GAD) is chronic, excessive, and uncontrollable worry (APA, 2013). In addition to impairment in multiple areas of functioning, children with GAD report persistent worries about a range of topics and experience physical symptoms (APA, 2001; Hudson, Deveney, & Taylor, 2005). To meet diagnostic criteria for GAD, children need to have experienced excessive and uncontrollable worry for a period of at least 6 months and to be experiencing distress and impairment in functioning (APA, 2013).

The treatment with the most empirical support for childhood anxiety disorders including GAD is cognitive behavioural therapy (CBT). Numerous studies have shown CBT to be effective (Cartwright-Hatton, 2008; In-Albon, 2007; Reynolds, 2012). Two large meta-analyses using 20+ random controlled trials (RCTs) each reported treatment efficacy with large effect sizes (In-Albon, 2007; Reynolds, 2012). Treatment outcomes for specific disorders including GAD are generally not reported. This is likely due to the
fact that the majority of anxiety treatment research with children is based on trans-
diagnostic treatment packages (Reynolds, 2012). There is a need, though, for insight into
the most effective specific treatment though for the chronic and persistent worry
associated with GAD. As many as 55 % of children with anxiety disorders meet criteria
for GAD and up to half of children with an anxiety disorder will continue to meet
diagnostic criteria even after ‘best practice’ CBT intervention (Hudson et al., 2005).

Pathological worry is an important behaviour to focus on in anxiety treatment
research for two reasons. Firstly, studies of CBT treatments of GAD have revealed low
rates of high end-state functioning after treatment (Borkovec & Costello, 1993; Butler,
Fennell, Robson, & Gelder, 1991). And secondly, there are likely children experiencing
the pervasive and uncontrollable worry of GAD without having yet developed the
cognitive ability to benefit from traditional CBT treatment. Treatment of worry using
traditional CBT protocol requires children to either examine thoughts for ‘cognitive
distortion’, or to practice notice worrying thoughts and moving attention to present
moment lived-experience (Rapee, 2001). For many children this activity may be difficult.
Research into children’s cognitive development reveals that the ability to identify and
draw insight into thought activity is a skill that develops over time and doesn’t emerge
until approximately 8-9 years of age (Flavell et al., 2000). The present research aims to
develop treatment for children with symptoms of GAD by incorporating strategies within
what is referred to in the literature as the ‘third wave’ of behavioural therapy (Hayes,
2004).

Historically, CBT has been positioned as the ‘second wave’ in the evolution of
behaviour therapy. The term ‘CBT’ emerged from treatment packages developed from
the principle that the form and function of cognition lead to direct emotional and behaviour change (Beck, 1964; Ellis, 1962; Hayes, 2004). The following ‘third wave’ behaviour therapy approaches involves a slightly different approach.

At the centre of third wave behavioural therapy is a philosophical shift whereby treatment involved less time focusing on the form or frequency of specific thoughts and instead focused on the teaching of skills to help individuals change the way they relate to troubling feelings or thoughts (Hayes, 2004). Common components of third wave behavioural therapies have in common an emphasis on ‘mindfulness’ – the ability to fully engage with the present moment, ‘acceptance’ – the ability to perceive internal psychological events without judgement, ‘defusion’ – the degree to view thoughts not necessarily permanent or part of the individual, as well as ‘values’ - an individual’s connection to their values in life (Hayes, 2004; Ruiz, 2012). Some examples of specific third wave behaviour therapies include Dialectical Behavior Therapy (DBT) (Linehan, 1993), Acceptance and Commitment Therapy (ACT) (Hayes, 2004), and Acceptance Based Behavioural Therapy (ABBT) (Roemer & Orsillo 2002). Third wave behavioural therapy has not been previously trialled to specifically treat GAD in children.

Mindfulness-Based Cognitive Therapy (MBCT) – a third wave behaviour therapy has been found to reduce symptoms of anxiety generally within 9-13 year olds with a moderate to large effect size (Semple, Lee, Rosa, & Miller, 2010). The present research also involved administration of a form of third wave behavioural therapy. Specifically, administration of a pilot study using Acceptance Based Behavioural Therapy to treat pathological worry in children.

Trials of ABBT for GAD in adult populations have produced promising results. This is particularly true in comparison to traditional CBT regarding the maintenance of high end-state functioning. In one study, 77% achieved high end state functioning at 3 and 9 month follow up intervals (Roemer, Orsillo, & Salters-Pedneault, 2008). In other studies, treatment effects either maintained or increased at follow up intervals (Treanor et al., 2011, Roemer et al., 2009). These results compare favourably to earlier CBT studies where GAD treatment reported as few as 42% of individuals reporting high end state functioning after treatment (Butler et al., 1991). To assist in the translation of an ABBT treatment for adults to a treatment for children, the present research incorporated a multisensory learning model.

A multisensory learning model was incorporated into an ABBT treatment in order to help children understand concepts of mindfulness, acceptance, and defusion. The model was designed to help children to view thoughts as not necessarily true or
permanent and to be able to develop acceptance of discomfort. The learning model was hypothesised to increase understanding of these abstract concepts through the introduction of concrete, visual, and kinaesthetic sensory stimulus. Evidence from evolutionary, cognitive, and educational branches of psychology supports the notion that multisensory stimulus can enhance learning and that the model has the potential to improve anxiety treatment outcomes for children.

The present study, in pilot study guise, investigated the efficacy of an ABBT treatment with a multisensory learning model alongside an ABBT treatment without a multisensory learning model. It was intended that administration of a pilot study would enable refinement of treatment protocol and create awareness of potential difficulties with administration of the ABBT in future larger scale research projects. In addition to providing information about the feasibility of a larger scale research project, it was anticipated that outcome date could be produced from ABBT treatment programs with and without multisensory learning models.

To this end, fourteen participants aged between 7-11 years were recruited from the community through flyers and school counsellors. Participants were randomly allocated to either an ABBT treatment with learning model condition, or an ABBT treatment without learning model condition. Questionnaires were administered to children and parents at pre and post-intervention points to measure levels of anxiety, worry, and to collect information about mediating variables of mindfulness, acceptance, fusion, and experiential avoidance.

The research contained the following three hypotheses: A ‘third wave’ ABBT treatment for children will be effective in reducing anxiety and worry in children as
measured by a decline in child and parent reported symptoms of generalised anxiety. Secondly, an ABBT treatment for children using a tactile stimulus will improve treatment outcomes over ABBT treatment not including a tactile stimulus. Thirdly, that reduction in children’s anxiety and worry will be associated with both reduction in measures of experiential avoidance and fusion, and increases in measures of acceptance and mindfulness.

Comparison of the relative efficacy of the ABBT treatment with learning model and ABBT treatment without learning model conditions were analysed by a comparison of the mean differences between pre-test and post-test scores on each outcome measure. Outcome measures included the Spence Children’s Anxiety Scale – parent and child versions (SCAS), Penn State Worry Questionnaire – Child (PSWQ-C), and Strengths and Difficulties Questionnaire (SDQ). The Avoidance and Fusion Questionnaire for Youth (AFQ-Y) and the Child Acceptance and Mindfulness Measure (CAMM) were each also administered at pre-test and post-test intervals to measure variables of experiential avoidance, defusion, acceptance, and mindfulness – variables hypothesized to mediate reductions in anxiety and worry. Treatment effects were analysed using the Wilcoxon related samples signed rank test (Wilcoxon, 1945). Comparison of the relative efficacy of the ABBT treatment with learning model and ABBT treatment without learning model conditions were analysed by a comparison of the mean differences between pre-test and post-test scores on each outcome measure.

The study had some limitations including a shorter than ideal length of treatment, a relatively small number of participants, featured some challenges associated with treatment delivery, and lacked a wait-list control group. The research suggests that the
optimum length of children’s anxiety treatment is 13-16 hours with at least 11 sessions (Ishikawa, Okajima, Matsuoka, & Sakano, 2007). Practical considerations led to this pilot study taking 7 hours over 7 sessions. The pilot study also involved a relatively small number of participants (n=11 after 3 participants dropped out). A larger number of participants may have provided more information about the value added to treatment by the multisensory learning model. Larger sample sizes were required for the statistical power for detect the smaller effect sizes expected when comparing two active treatments (Cohen, 1988). The two active treatments in this case were the ‘ABBT with learning model’ and ‘ABBT without learning model’ conditions. Regarding treatment delivery, time management was an issue with planned content occasionally not being administered due to there being insufficient time. Finally, the study would have provided a more scientific evaluation of the ABBT treatment had there been an additional wait-list control condition with a group of participants providing questionnaire data without receiving the intervention. The current design did control for a possible ‘learning model’ effect. However, a wait-list control group would have provided greater control of the ABBT treatment effect by reducing the chance of confounding variables influencing results.

Notwithstanding the study’s limitations, an association was found ‘third wave’ Acceptance Based Behavioural Therapy (ABBT) treatment and significant reductions in anxiety and worry in participating children. Measures of parent and child reported anxiety and worry were reduced with small-moderate and moderate-large effect sizes respectively. Treatment effects were not associated with decreases in measures of experiential avoidance and fusion, or increases in measures of acceptance and mindfulness. Comparison of difference scores between pre and post treatment means did
not reveal a marked difference outcome measures of ‘with’ and ‘without’ learning model treatment conditions. Anecdotal information from written program evaluation forms did, however, suggest that the model was helpful in increasing children’s understanding of the abstract concepts of mindfulness, acceptance, and defusion.
CHAPTER 2 – LITERATURE REVIEW

2.1. Children and anxiety

Problems with anxiety are often overlooked in children. Difficulties are often considered to be ‘just a phase’ and something which children will grow out of (Hudson, 2005). However, anxiety disorders can result in significant psychological distress and can have a wide-ranging impact on functioning (Beesdo, Knappe, & Pine, 2009; Somers, Goldner, Waraich, & Hsu, 2006). Childhood anxiety disorders have been associated with low self-esteem, impaired social functioning, problems with concentration, and poor school performance (Ialongo, Edelson, Werthermer-Larsson, Crockett, & Kellam, 1996; Strauss, Frame, & Forehand, 1987). The presence of an anxiety disorder in childhood also places children at greater risk for subsequent anxiety, depression, and substance dependence into adulthood (Woodward & Fergusson, 2001). The diagnosis of an anxiety disorder in childhood requires fear or anxiety to be excessive or persist beyond developmentally appropriate periods. The diagnostic criteria in the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013) requires for the majority of anxiety disorders for symptoms to have been evident for a period of at least six months.

There are various diagnostic categories for difficulties with anxiety in childhood. The difference between the various anxiety disorders relates to the type of situations or objects that lead to fear, anxiety or avoidance, and the associated thoughts. The majority of children with anxiety disorders will qualify for one or more of five disorders; Separation Anxiety Disorder, Selective Mutism, Specific Phobia, Social Anxiety Disorder, and/or Generalized Anxiety Disorder (American Psychiatric Association (APA),
There are other psychological childhood disorders of which anxiety has a significant component – but are not classified as anxiety disorders. Examples of these include Obsessive Compulsive and related disorders, Trauma and stressor related disorders, and feeding and eating disorders (See American Psychiatric Association, 2013 for additional information and full diagnostic criteria for each anxiety disorder).

For children with an anxiety disorder, it is the rule rather than the exception to meet diagnostic criteria for a second, or even a third anxiety disorder (Hudson, 2005). For instance, in one study assessing 199 anxiety disordered children, 83% were found to meet diagnostic criteria for two or more disorders (Verduin & Kendall, 2003). A common anxiety disorder for children is Generalized Anxiety Disorder (Masi et al., 2004).

2.2. Generalized Anxiety Disorder

The principle diagnostic criterion for Generalized Anxiety Disorder (GAD) is chronic, excessive, and uncontrollable worry (APA, 2013). Worry is a feature of all anxiety disorders but is central to GAD. Children with GAD report persistent worries about a range of topics, experience physical symptoms, and experience distress or impairment in multiple areas of functioning (APA, 2001; Hudson, Deveney, & Taylor, 2005). The mean onset of GAD is estimated to be about 8.5 years of age and has been estimated to affect between 3 - 15% of the population (Anderson, Williams, McGee, & Silva, 1987; Beidel, 1991; Costello, Egger, & Angold, 2005; Masi et al., 2004). The impact of childhood onset GAD is not limited to childhood.

GAD is reported to often take a chronic course and presence in childhood increases the risk of associated difficulties in adulthood. One study estimated that on average, 46% of GAD children would continue to be symptomatic 8 years after onset.
(Benjamin, Costello, & Warren, 1990). It is also known that childhood anxiety disorders place children at greater risk for subsequent anxiety, depression, and substance dependence as young adults (Woodward & Fergusson, 2001). There are differences between the worry experienced by the majority of the population, and the worry experienced by individuals with GAD.

2.3. Worry

The psychological literature distinguishes ‘normal’ worry from ‘pathological’ worry (Olatunji, Wolitzky-Taylor, Sawchuk, & Ciesielski, 2010). ‘Normal’ worry has been defined as “mild, transient, generally limited in scope, and experienced by the majority of individuals” (Ruscio, 2002, p.378). Pathological worry, on the other hand, is pervasive, chronic, and uncontrollable (APA, 2013). Researchers have investigated whether there are any qualitative differences between the process of worry as experienced by pathological and normal worriers.

Research suggests that the structure of worry experienced by normal and pathological worriers is essentially the same. After applying three taxometric procedures to two large (n=1000+) samples, Olatunji and colleagues (2010) concluded that the worry experienced by normal and pathological worriers is best viewed as the same verbal linguistic thought process but at opposite ends of a continuum. There have been, however, marked differences reported between the experience of pathological and ‘normal’ worriers.

The experience of worry has been reported to vary significantly between pathological and ‘normal’ worriers. ‘Normal’ worriers report engaging in less catastrophic thinking than do pathological worriers (Szabo & Lovibond, 2004) and report
having a greater sense of control over their worry (Parkinson & Rachman, 1981; Behar, DiMarco, Hekler, Mohlman, & Staples, 2009). It has also been found that normal worriers tend to worry about realistic problems whereas pathological worriers focus on imagined problems or problems unlikely to ever occur (Tallis, Davey, & Capuzzo, 1994). A greater understanding of worry can be gained from comparing it to the notion of anxiety.

Worry and Anxiety have been found to be closely correlated but also independent constructs (Heller & Nitschke, 1998; Zebb & Beck, 1998). Worry can be defined as a process of language based thought activity revolving around problem identification whereas anxiety has been conceptualised as a ‘vague, uncomfortable feeling of fear, dread, or danger from an unknown source.’ (Gana, Martin, & Canouet., 2001 p.221). There is empirical support for the notion that worry and anxiety are independent constructs. Different areas of brain activation have been associated with worry and somatic anxiety respectively (Heller & Nitschke, 1998), and anxiety has exclusively been associated with negative affect and perceived personal control (Davey, Hampton, Farrell, & Davidson, 1992). Evidence of a directional relationship between anxiety and worry has also been explored. The evidence revealed a directional relationship and suggested that worry may cause anxiety (Borkovec, Robinson, Pruzinsky, & DePree, 1983; Gana, Martin, & Canouet, 2001). The impact of anxiety and worry on the lives of children will also be discussed.

2.4. The impact of worry on children

The pervasive and uncontrollable worry of GAD can have a major impact on children. In addition to causing psychological distress, worry can impact on physical
health (Spruijt-Metz & Spruijt, 1997) and place children at risk for comorbidity with depression and other anxiety disorders (Costello, Egger, & Angold, 2005; Masi, Favilla, Mucci, & Millepiedi, 2000; Masi, Mucci, Favilla, Romano, & Poli, 1999). GAD often presents comorbid with other anxiety disorders, especially Social Phobia and/or Separation Anxiety Disorder. Depression is also often comorbid with GAD. In one particular sample, 62% of children with GAD were found to have a comorbid diagnosis of depression (Masi et al., 2000). The core feature of GAD, worry, is also a feature of other anxiety disorders.

Worry has been found to be highly correlated with anxiety and consequently impacts every child with an anxiety disorder (Olatunji, Broman-Fulks, Bergman, Green, & Zlomke, 2010). Worry features particularly prominently in children with Separation Anxiety Disorder and Social Phobia. These disorders are among the more common anxiety disorders for children and demonstrate the reach of the impact that pathological worry can have on the child population (Verduin & Kendall, 2003). The reach of the impact of worry and GAD on the child population could be greater than what current data suggests.

The impact is unclear because GAD, like all anxiety disorders, is both under reported and under treated (Chavira et al., 2004). It has been said that only when children experience distressing physical symptoms or major functional impairment that treatment intervention is sought (Hudson et al., 2005).

2.5. Theoretical models of pathological worry

Pathological worry is best conceptualized by a number of independent yet complementary theoretical models. In the following section, six different theoretical
models will be reviewed. The models highlight different factors which best account for the maintenance of pathological worry when considered together. The models each have varying degrees of empirical support. The models most strongly supported and which seem to be of central importance to the maintenance of pathological worry are Borkovec’s (1994) Avoidance Model of Worry (AMW), Dugas et al.’s (1995) Intolerance of Uncertainty model (IUM), and Roemer and Orsillo’s (2002) Acceptance Based Model of worry (ABM). Models with limited empirical support also claiming to offer account of the maintenance of worry are Hirsch & Mathews’ (2012) Cognitive Model of Pathological Worry, Mennin et al.’s (2002) Emotional Dysregulation Model, and Wells’ (1995) Metacognitive Model of worry. Each model will be individually evaluated in light of their empirical support. First to be evaluated will be Borkovec’s (1994) seminal AMW.

2.6. Borkovec’s (1994) Avoidance Model of Worry

The AMW asserts that worry is essentially a verbal linguistic thought process that provides individuals with a means of avoiding aversive and anxiety-provoking mental imagery (Borkovec, 1994). The process of avoiding aversive mental imagery is referred to by the AMW as ‘cognitive avoidance’ and is theorized to be negatively reinforcing (Borkovec, 1994; Borkovec & Inz, 1990). The AMW asserts that worry is maintained in three ways. Firstly, it is asserted that worry is maintained through ‘cognitive avoidance’. Secondly, it is asserted that pathological worry is maintained by individuals developing maladaptive and positive beliefs about worry. It is suggested that pathological worriers develop positive beliefs about the usefulness of worry in solving real life problems. Thirdly, the AMW asserts that worry is further positively reinforced by the inherent
qualities of worry in suppressing somatic activation (Borkovec, 1994; Borkovec, Alkaine, & Behar, 2004). The empirical support behind each of the three tenants of the AMW will be reviewed.

There is sound empirical support for the AMW’s notion of cognitive avoidance. Borkovec and Inz (1990) recorded thoughts and images reported by individuals with and without GAD. Individuals alternated from enduring periods of worry to sitting through periods of relaxation. It was found that during periods of relaxation, individuals without GAD reported a predominance of imagery over verbal thought activity. When these individuals entered a period of worry, there was a shift where individuals instead of reporting a predominance of imagery, reported a predominance of verbal thought activity. This shift provides support for the notion that worry is essentially a verbal thought activity and is negatively reinforcing. When individuals with GAD were put through the same process, they reported a much greater proportion of thought activity during relaxation periods than did the individuals without GAD (Borkovec & Inz, 1990). This was expected and was consistent with the AMW’s notion of cognitive avoidance. There is also support for the AMW’s assertion that pathological worriers adopt positive beliefs about worry.

The evidence suggests that positive beliefs about worry probably do play a role in the maintenance of worry. The research does, however, contain some inconsistencies. Dugas et al. (1995) found that positive beliefs about worry discriminated individuals with GAD from non-anxious controls. However, Dugas, Marchand, & Ladouceur (2005) struggled to reproduce this finding. Dugas et al. (1995) reported significant results with limited statistical power (n=122) suggesting that within their sample there was a
considerable effect. Consequently, the results should not be readily dismissed. The empirical support for the AMW’s assertion that worry can be maintained by its ability to suppress somatic activation will be discussed.

The research does suggest that worry serves to suppress somatic activation. It has been found that in the face of threat, worry has a ‘numbing’ effect on the body’s physiological reactions. Studies have found that worry suppresses physiological arousal both when individuals are presented with threatening stimuli and in the absence of threatening stimuli (Behar, DiMarco, Hekler, Mohlman, & Staples, 2009; Hoehn-Saric & McLeod, 1988; Peasley-Miklus & Vrana, 2000). This ‘numbing’ effect of physiological arousal supports the AMW’s assertion that worry is negatively reinforcing. Overall, despite some inconsistency in the literature, the AMW’s claims seem to have sound empirical support. Dugas et al.’s (1995) Intolerance of Uncertainty model of worry (IUM) is another theoretical model of worry that will be reviewed.


The IUM expands upon Borkovec’s (1994) seminal AMW. The IUM shares many components with the AMW. Both the IUM and the AMW assert that individuals engage in cognitive avoidance and that chronic worry is reinforced by maladaptive positive beliefs about worry (Borkovec, 1994; Dugas et al., 1995; Dugas, Marchand, & Ladouceur, 2005). However, the IUM features two components that the AMW does not. The IUM contains the construct of Intolerance of Uncertainty (IU) and the notion that chronic worriers take a ‘negative approach to problem solving’ (Dugas et al., 1994).

Intolerance of Uncertainty is a measure of the degree of distress associated with the presentation of an ambiguous situation (Dugas & Koerner, 2005). The IUM states that
it is Intolerance of Uncertainty (IU) that ‘kicks off’ cognitive avoidance and produces negative approaches to problem solving (Dugas et al., 1994; 2005). The IUM asserts that both of these processes maintain pathological worry. The IUM’s ‘approach to problem solving’ variable states that pathological worriers tend to have a lack of confidence in the ability to solve problems, see problems as threats, and have pessimism regarding their ability to solve problems or experience frustration with dealing with problems (Dugas & Koerner, 2005). The empirical support for the IUM factors of IU and the ‘approach to problem solving’ variable will each be evaluated.

The literature indicates that IU probably does play a significant role in the maintenance of worry. It seems that the variable of ‘approach to problem solving’ also plays a role but possibly a less significant one. Two studies investigated whether IU and/or approach to problem solving could distinguish individuals with GAD from non-anxious controls (Dugas, Marchand, & Ladouceur, 2005; Ladouceur et al., 1999). In both studies, IU successfully differentiated individuals with GAD from non-anxious controls. However, in neither case did the ‘approach to problem solving’ variable do the same. Supporting the IUM’s ‘negative approach to problem solving variable’ was a third study where approach to problem solving was able to predict GAD symptom severity (Dugas et al., 2007). Overall, the evidence does suggest that factors unique to the IUM do play a role in maintaining the pathological worry experienced by individuals with GAD.

Roemer and Orsillo’s (2002) Acceptance Based Model of Worry (ABM) is another model of worry that will be reviewed.

The Acceptance Based Model (ABM) of Generalized Anxiety Disorder is another theoretical model of worry. The ABM borrows from Borkovec’s (1994) AMW an emphasis on the role of avoidance in the maintenance of pathological worry. The ABM proposes that three factors are responsible for maintaining pathological worry: A problematic relationship with internal experiences, experiential avoidance, and behavioural restriction (Roemer & Orsillo, 2002; Roemer, Salters, Raffa, & Orsillo, 2005). Each component will be described in turn before the model’s empirical basis is reviewed.

The ABM asserts that individuals who engage in chronic worry have a problematic relationship with internal experiences. Specifically, this entails reacting negatively to internal experiences and becoming fused with their cognitions. ‘Cognitive fusion’ refers to the degree to which an individual becomes entangled with a thought or feeling and sees it as a permanent characteristic of themselves (Roemer & Orsillo, 2002). The second component of the ABM claimed to maintain pathological worry is the construct outlined by Hayes, Wilson, Gifford, Follette, & Strosahl (1996) of ‘experiential avoidance’.

‘Experiential avoidance’ is defined as automatic or active avoidance of a private experience (bodily sensations, thoughts, emotions etc.) that a person perceives to be threatening or is unwilling to remain in contact with (Hayes et. al., 1996, Roemer & Orsillo, 2002) ‘Experiential’ avoidance is similar in concept to Borkovec’s (1994) ‘cognitive avoidance’ but broader in scope. ‘Experiential avoidance’ differs in providing an additional account of how language plays a role in the formation of particularly
aversive thoughts or memories. It is suggested that the meaning of terms can be bi-
directionally and arbitrarily transferred between contextually linked words. Hayes et al.
(1996) illustrates with the example of the term ‘anxiety.’ It is explained that if for a
person ‘anxiety’ tended to predict a loss of control and loss of control tended to be
followed by ‘social humiliation,’ then the aversiveness of the term ‘anxiety’ would have
increased due to its meaning having been arbitrarily and contextually linked to the
meaning of ‘humiliation.’ Experiential Avoidance seems to present a logically cohesive
account for how particular private experiences can become so aversive and produce such
psychological distress. The third component of the Roemer and Orsillo’s (2002) ABM is
‘behaviour restriction.’

The Acceptance Based Model of worry (ABM) suggests that a consequence of
experiential avoidance of those with GAD is behaviour restriction (Roemer & Orsillo,
2002, 2005). It is argued that as individuals worry and catastrophise future events, they
experience fight or flight responses ‘without any fight or fleeing behaviours made
available to them’ (Roemer and Orsillo, 2002, p. 59). The ABM suggests that as a result,
individuals tend not to pursue desired actions or engage in activities that are important to
them (Roemer & Orsillo, 2002, 2005). The empirical support for the ‘problematic
relationship with internal experiences’, ‘experiential avoidance’, and ‘behaviour
restriction’ components of the ABM will be discussed.

On balance, the central tenants of the ABM are well supported. The notion that
worry is maintained by problematic relationships with internal experiences is reflected in
research findings that individuals with GAD reported greater distress about emotions, had
more difficulty with emotional regulation, and reported lower levels of mindfulness than
did non-anxious controls (Lee, Orsillo, Roemer, & Allen, 2010; Michelson, Lee, Orsillo, & Roemer, 2008; Roemer et al. 2009). The role of experiential avoidance in maintaining worry is also well supported in the finding of its association with GAD symptom severity (Roemer et al., 2005). The role of behavioural avoidance is similarly well supported. Individuals with GAD have been found to engage in fewer valued actions than non-anxious controls (Roemer et al. 2009). There have been, however, some research findings inconsistent with the account of worry given by the ABM.

Significantly, one particular study found that nineteen individuals with GAD did not associate experiential avoidance and ‘negative reactions to emotions’ with GAD symptom severity (Roemer et al., 2005). A possible explanation for this result may have been that the study lacked statistical power to be sensitive to small or medium effect sizes (n=19).

Despite this apparent anomaly, the central tenants of the ABM seem to be well supported and suggest that a ‘problematic relationship with internal experiences’, ‘experiential avoidance’, and ‘behavioural restriction’ each do play a role in maintaining the pathological worry associated with GAD. In addition to the AMW, IUM, and ABM, there are other theoretical models of worry that have received limited empirical support. Referred to in this dissertation as ‘secondary models of worry’, their contribution to the understanding of pathological worry will also be reviewed.

2.9. Secondary theoretical models of worry

maintenance of pathological worry. The Metacognitive Model of GAD asserts that chronic worry is maintained in part by meta worry or ‘worry about worry’ (Wells, 1995); The Emotional Dysregulation Model asserts that GAD is maintained by poor management and/or understanding of emotions (Mennin et al., 2002), and the Cognitive model of GAD asserts that emotional processing biases and a lack of attentional control are each significant maintaining factors (Hirsch & Matthews, 2012). However, there are issues with the empirical support base for each model. First the empirical support for the Metacognitive Model of GAD will be discussed.

Wells’ (1995) Metacognitive model asserts that metacognition or ‘worry about worry’ is a maintaining factor of pathological worry. Studies have found that individuals with GAD do engage in ‘worry about worry’ (Ruscio & Borkovec, 2004) and enhanced levels of meta-worry can discriminate individuals with GAD from individuals with other anxiety disorders (Davis & Valentiner, 2000; Wells & Carter, 2001). However, there are concerns regarding the validity of this evidence. It has been suggested that the instruments used to measure meta-worry also directly tap into criterion of GAD and in doing so introduce a degree of circularity to the claim that meta-worry can discriminate individuals with GAD from those without it (Behar et al., 2009). There is enough evidence, however, for the role of worry to be considered in an inclusive and complete account of pathological worry. The empirical support for the Emotional Dysregulation Model of worry will also be reviewed.

Menin’s Emotional Dysregulation Model asserts that symptoms of GAD are maintained by poor management and/or understanding of emotion (Mennin et al., 2002). A number of studies did support central tenants of the model. For example, it was found
that individuals with GAD experienced negative emotions more intensely (Turk, Heimberg, Luterek, Mennin, & Fresco, 2005) and found it more difficult to identify and understand their emotions than did non-anxious controls (Mennin, Holaway, Fresco, Moore, & Heimberg, 2007). However, these findings were not consistently reproduced. Some studies did not find that individuals with GAD had greater difficulty with emotional regulation or had reduced awareness about their emotions than did non-anxious controls. (Decker, Turk, Hess, & Murray, 2008; Novick-Kline, Turk, Mennin, Hoyt, & Gallagher, 2005). However, similar to the case of the Metacognitive Model of GAD, the research into the role of emotional dysregulation in maintaining worry is significant enough to warrant inclusion in an inclusive and complete account of pathological worry. Hirsch’s cognitive model of GAD is another ‘secondary model of worry’ which will be reviewed.

Hirsch and Mathews’ (2012) Cognitive Model of Generalized Anxiety Disorder asserts that it is an emotional processing bias and limitation in control of attention during worry that contributes to the maintenance of pathological worry. At the center of the model is the claim that emotional processing biases are responsible for continually bringing threatening thoughts into awareness (Hirsch & Matthews, 2012). However, more empirical data is required before a judgment can be made on the model’s claims. The data that has been collected to date is promising though. Pathological worry has been associated with a tendency to interpret ambiguous stimuli as threatening (Hirsch, Hayes, & Mathews, 2009) and anxiety has been associated with longer delays in the shift of attention away from threatening stimuli (Peers & Lawrence, 2009). The model’s claims will be strengthened with data that can demonstrate that attentional processing biases can
discriminate individuals with GAD from those with other anxiety disorders. Currently, the Cognitive Model of GAD is best categorized with the Metacognitive Model of GAD and the Emotional Dysregulation Model of GAD in providing complementary accounts of the maintenance of pathological worry with a level of empirical support that is secondary to the AMW, IUM, and ABM respectively. Each of the six theoretical models of worry discussed will be evaluated and ranked in regards to the strength of their claims in light of available empirical data.

2.10. Evaluation of theoretical models of worry

The literature suggests that each of the aforementioned theoretical models of GAD have merit. It has been shown that each model received a level of empirical support and that the claims of each of the different models are not mutually exclusive but complementary. Out of the ‘primary’ models of worry – the Avoidance Model of Worry (AMW), Intolerance of Uncertainty Model of Worry (IUM), and Acceptance Based Model of Worry (ABM), it is the IUM which has, at face value, the greatest level of empirical support. The IUM expanded upon Borkovec’s (1994) seminal AMW which itself had strong empirical support. The IUM’s introduction of the notion of Intolerance of Uncertainty (IU) was found to be able to reliably discriminate individuals with and without GAD so can be seen as adding value.

The ABM was also well supported and came close to the level of support associated with the IUM (Dugas et al., 2005; Ladouceur et al., 1999). The ABM fell just short of the IUM because of some inconsistency of results in the literature. Roemer et al. (2005) were unable to find a link between experiential avoidance and GAD symptom severity which was potentially problematic as experiential avoidance was a central
component of the ABM. The level of empirical support for the ‘secondary models of worry’ including the Metacognitive Model, Emotional Dysregulation Model, and Cognitive Model can also be placed into a hierarchy.

Of the ‘secondary models of worry’, the Cognitive Model of Worry had the most empirical support, followed by the Metacognitive Model, and then the Emotional Disregulation Model. Research into the role of emotional bias’ and attentional control to maintain GAD has produced results entirely consistent with the Cognitive Model (Hirsch, Hayes, & Mathews, 2009; Peers & Lawrence, 2009). It was a lack of quantity of data that prevented the Cognitive Model from being elevated to the same ‘primary’ category as the AMW, IUM, and ABM.

The Metacognitive Model of Worry was also found to have empirical support. With the resolution of methodological issues, particularly in respect to investigation into the role of meta-worry, the Metacognitive Model of Worry may be categorised in the future as a ‘primary’ model of worry.

Regarding the Emotional Dysregulation Model of worry, there is significant inconsistency from previous research. However, some studies did find that individuals with GAD experience negative emotions more intensely (Turk et. al, 2005) and found it more difficult to identify and understand their emotions than did individuals without GAD (Mennin et al., 2007). It is possible that future theoretical development of worry will help to account for the inconsistency of empirical support for this model.

Each theoretical model of worry had a degree of empirical support which suggests that each may have benefits for the development of treatment for GAD. Each theoretical
model of worry will also be evaluated in light of its potential for contributing to the development of treatment for GAD.

2.11. Treatment of Generalized Anxiety Disorder in light of theoretical models of pathological worry.

Of each of the theoretical models of worry discussed, it is the Acceptance Based Model of Worry (ABM) that offers the greatest promise for the development of treatment for GAD. The ABM holds particular promise for the treatment of GAD for three reasons. Firstly, the ABM provides a theoretical framework for analyzing the role that language plays in worry. Secondly, the ABM places emphasis on objective and actual experience as opposed to experience at the cognitive level (Roemer & Orsillo, 2002). Thirdly, the ‘behavioural restriction’ component of the ABM offers promise for overcoming a limitation of previous GAD treatments which was low rates of high end state functioning after treatment (Borkovec & Costello, 1993; Butler, Fennell, Robson, & Gelder, 1991).

Providing a theoretical framework for analyzing the role that language plays in worry may add value to treatment of GAD. This is because the process of worry is itself a form of verbal processing based on language (Behar et al., 2009; Borkovec et al., 1994). The verbal-linguistic nature of worry suggests that treatments taking into account Hayes’ (1996) notion of experiential avoidance may add value to treatment. The ABM’s component of ‘experiential avoidance’ asserts that the meaning or stimulus function of key terms is arbitrarily shaped from the context in which they are used (Hayes et al., 1996; Roemer & Orsillo, 2002). An example previously used was the stimulus function of the term ‘anxiety’ taking on the meaning of the term ‘humiliation’ after being considered in the same context. In comparison to other theoretical models, both the AMW and the IUM
include components of avoidance, but neither share the ABM’s capacity to analyze the impact of individual terms within the content of an individual’s worry. Another component of the ABM which suggests that it may have particular promise for GAD treatment is the way in which the ABM conceptualizes avoidance behaviour.

The second reason for the ABM holding particular promise to inform GAD treatment is the ABM’s conceptualization of avoidance taking into account both internal and external events and experiences. The AMW and IUM conceptualized avoidance in their models of worry as reaction to exclusively cognitive events (Borkovec, 1994; Dugas, 1995). The authors of the ABM claim that emphasis on objective experience is important for treatment because chronic worriers repeatedly rehearse catastrophic scenarios without experiencing the real life consequences (Roemer & Orsillo, 2002). The authors of the ABM claim that as a result of repeatedly rehearsing catastrophic scenarios, chronic worriers often lose the ability to accurately interpret feedback from the environment (Roemer & Orsillo, 2002). This argument is empirically supported. Worry has been found to be verbal linguistic in nature (Borkovec & Inz 1990) and behaviour maintained by verbal contingencies has been found to be more resistant to disconfirming evidence than behavior shaped by contact with actual experience (Hayes & Ju, 1998). Such findings support the notion that it is important for chronic worriers to be aware of both internal and objective external experiences. Another way in which the ABM provides promise for the development of GAD treatment is in the effect that worry has on broader patterns of behaviour as a maintaining variable for worry.

A third way in which the ABM demonstrates its promise for developing GAD treatment is through the component of ‘behaviour restriction.’ The ABM asserts that
because worry involves the process of catastrophising future events, individuals with GAD tend not to pursue desired or valued actions (Roemer et al., 2005; Roemer & Orsillo, 2002). The ABM’s ‘behaviour restriction’ component offers the framework for individuals to continue to actively engage in valued action after treatment which may have the effect of increasing rates of high end state functioning. A criticism of CBT-based specific GAD treatment was that treatment effects often didn’t translate into to high end state functioning after treatment (Borkovec & Costello, 1993; Butler, Fennell, Robson, & Gelder, 1991; Roemer & Orsillo, 2002). The consideration of ‘behaviour restriction’ seems to be exclusive to the ABM and is not featured in the AMW, IUM, or the aforementioned ‘secondary’ theoretical models of GAD. The literature concerning treatment for anxiety disorders will also be discussed.

2.12. The treatment of anxiety disorders

The ‘gold standard’ for the treatment of anxiety disorders across both adult and child populations is cognitive behavioural therapy (CBT) (The Australian Psychological Society [APS], 2010). Meta-analyses of random-controlled anxiety treatment trials using CBT consistently produce medium - large treatment effect sizes (In-albon, 2007; Otte, 2011; The Australian Psychological Society [APS], 2010).

The term CBT does not refer to a specific theoretical model or therapeutic approach. CBT has recently been described as ‘a tradition based on a scientific approach to psychopathology and psychotherapy’ (Ruiz, 2012). The term CBT emerged with the convergence of (neo) behaviourist approaches and emerging cognitive approaches from Beck (1964) and Ellis (1962) in the 1960s (Hayes, 2004; Ruiz 2012). Historically, the emergence of ‘CBT’ in the 1960s has been referred to as the ‘second wave’ in behavior
therapy (Hayes, 2004). The tradition of taking a scientific, empirical approach to treating psychopathology has been historically described as evolving in a series of three ‘waves’ of behaviour therapy (Hayes, 2004). An understanding of the evolution of treatment will be useful to provide a framework for the treatment approach informed by the Acceptance Based Model (ABM) of Worry known as Acceptance Based Behaviour Therapy (ABBT) (Roemer et al, 2005).

2.13. First wave behaviour therapy

The first wave of behaviour therapy has been broadly defined as the movement away from psychoanalysis with an emphasis on restoring scientific rigor (Hayes, 2004). The ‘first wave’ of behaviour therapies had in place an emphasis on theoretical links to scientific learning principles, emphasis on empirical outcome data, and improvement of the specificity of intervention (Hayes, 2004). Specifically, the term ‘first wave’ encompasses both the ‘methodological’ and the ‘neo’ behaviourist approaches.

Methodological Behaviourism was an approach to the analysis of behavior that took a hardline stance on analyzing only those behaviours that were directly observable. Neo Behaviourism expanded on methodological behaviourism by allowing the inclusion of internal psychological events such as feelings and thoughts in the analysis of behavior (Hayes, 2004). First wave behaviour therapy was followed by ‘second wave’ behavior therapy.

2.14. Second wave behavior therapy (Cognitive Behaviour Therapy)

The second wave of behaviour therapy emerged in the 1960s with the emergence of the cognitive therapy movement (Craske, 2010; Hayes, 2004). The initial cognitive therapy movement viewed cognition as a mediating variable in behaviour change and has
been criticized as being overly mechanistic (Hayes, 2004). In the early cognitive therapy movement, change in the form and function of cognitions were theorized to lead to direct emotional and behavior change (Beck, 1964; Ellis, 1962; Hayes, 2004). Behavioural and cognitive strategies were combined in treatment packages which underwent empirical scrutiny. The emergence of these combined treatment packages led to the term ‘CBT.’

Within the CBT movement, however, there remained in practice variation in adherence to cognitive or behaviourist approaches. It has been reported that clinically, therapists differed largely in the degree to which they saw the change of cognitive content as central for behavioural change (Ruiz 2012; Craske, 2010).

CBT was the subject of extensive empirical investigation regarding its efficacy in treating various forms of psychopathology (Hayes, 2004; Ruiz, 2012). However, the development of treatment approaches has been described as overly simplistic and mechanistic (Hayes, 2004). Cognitive distortions or ‘thinking mistakes’ were associated with particular disorders and it was largely these associations that guided specific treatment development (Craske, 2010; Hayes, 2004). CBT or ‘second wave’ behavioural therapy was followed by an emergence of what has since been described as a ‘third wave’ behavioural therapy movement (Hayes, 2004; Ruiz, 2012).

2.15. Third wave behaviour therapy

The ‘third wave’ behavioural therapy movement has been described as a philosophical shift away from the mechanistic approach of the second wave having adopted a more pragmatic way of thinking about psychopathology (Hayes, 2004). Whilst second wave behaviour therapy examined thoughts or beliefs against objective truth criterion, third wave behavior therapy would examine thoughts or beliefs with the sole
purpose of asking whether the thought or belief was helpful in enabling the individual to live the life that they wanted (Hayes, 2004; Ruiz, 2012). This approach referred to a way of thinking called functional contextualism (Hayes, 2004). A central characteristic of third wave behaviour therapy, therefore, is an emphasis on the context in which a psychological event occurs. The philosophical basis of functional contextualism means that third wave behaviour therapies spend less time focusing on the form or frequency of specific thoughts and focus on the teaching of skills to help individuals change the way they relate to troubling feelings or thoughts (Hayes, 2004). Consequently, there are many components that third wave behavioural therapies have in common. There is a common emphasis on ‘mindfulness’ – the ability to fully engage with the present moment, ‘acceptance’ – the ability to perceive internal psychological events without judgement, ‘defusion’ – the degree to which thoughts are viewed as part of the individual and permanent, as well as ‘values’ - an individual’s connection to their values in life (Hayes, 2004; Ruiz, 2012). Examples of specific third wave behaviour therapies include Dialectical Behavior Therapy (DBT) (Linehan, 1993), Cognitive Behavioral Analysis System of Psychotherapy (CBASP) (McCullough, 2000), Functional Analytic Psychotherapy (FAP) (Kohlenberg & Tsai, 1991), Integrative Behavioural Couple Therapy (IBCT) (Jacobson & Christensen, 1996), Mindfulness-based Stress Reduction (MBSR) (Kabat-Zinn, 1990), and Metacognitive Therapy (Wells, 2000). The most comprehensively researched of the third wave behavioural therapies is Acceptance and Commitment Therapy (ACT) (Hayes, 2004).

ACT is an example of a ‘third wave’ behavioural therapy which has been the subject of a rapidly expanding research base in recent years (Ruiz, 2012; Swain, 2013).
ACT is similar to other third wave behavioural therapies in that a goal of the therapy is to help clients improve their relationship with psychological events and more freely engage in behaviours that are aligned with core values. In ACT this freedom to engage in value-driven behaviour is known as ‘psychological flexibility’ (Hayes, Luoma, Bond, Masuda, & Lillis 2006). Similar to other third wave behaviour therapies, an ACT therapist would not see distressing feelings or thoughts as problems in and of themselves. Rather, it would be the individual’s struggle and tendency to interpret thoughts as permanent and true as the issue. ACT describes six ‘process’ factors that can be manipulated by a therapist to increase a client’s psychological flexibility. These are acceptance - the ability to embrace experience without judgment, cognitive defusion – the ability to see thoughts and feelings as simply transient psychological events, mindfulness – the ability to attend fully to the present moment, ‘self-as-context’ – the ability to recognize that we are not the content of our experiences, values – the ability to identify what is truly important, and ‘committed action’ – persistence in pursuing behaviour in line with personal values (Hayes, 2006). Each of these factors are described as interdependent on each other and serve as areas in which an ACT therapist can intervene to help improve a client’s psychological flexibility (Hayes et al., 2006). Hayes (2004) described ACT therapists as needing to require a “passionate interest in what a client truly wants.” Proponents of ACT suggests that with increased psychological flexibility, clients will have greater capacity to live a more meaningful life by engaging in behaviours that are in-line with their values and taking them to where they really want to be (Hayes et al., 2006; Ruiz, 2012; Swain, 2013). ACT distinguishes itself from the pool of other third wave behaviour therapies as
the first therapeutic model to draw on a theory of language and cognition called
‘Relational Frame Theory’ (RFT) (Hayes, 2004).

RFT is a theory of language and cognition that offers an account of how particular
thoughts or memories can be particularly aversive and produce suppression or avoidance
behaviours. RFT suggests that the meaning or stimulus function of thoughts can be
arbitrarily transformed or modified based on the context in which they are experienced
(Hayes, 2004). For example, if the thought of attending a party tends to lead to
catastrophic thoughts of humiliation and panic, then the effect of the word ‘party’ will be
arbitrarily transformed to include the effect of the term ‘panic.’ RFT suggests that the
meaning or stimulus function of all language exist in multiple underlying ‘relational
frames’ (Hayes, 1996; Hayes, 2004). It is the ability for terms to continually and
increasingly adopt the stimulus function of contextually linked terms that account for
how particular thoughts can become so aversive. The implication of relational learning is
that many seemingly unrelated stimuli in an individual’s life can become aversive
through ‘relational frames’ (Hayes, 2004; Hayes et al., 2006). Relational learning is quite
separate to associative learning and has so far been understood only to exist within
humans (Hayes, 2004). The ACT model through its six ‘process factors’ draws upon RFT
and relational learning along with other, classical associative learning principles (Hayes
et al., 2006). Mindfulness, one of the shared components linking third wave behaviour
therapies will also be reviewed.

2.16. Mindfulness

Mindfulness has been described as ‘the awareness that emerges through paying
attention on purpose in the present moment’ (Kabat-Zinn, 2003, p.145). In the context of
anxiety treatment, mindfulness is associated with intervention to *increase* an individual’s awareness of thoughts and feelings (Hofmann, Sawyer, Witt, & Oh, 2010; Kabat-Zinn, 2003). Within anxiety treatment, mindfulness is often increased by way of formal mindfulness meditation. Mindfulness meditation can take a variety of forms and focuses on building awareness by engaging in regular ‘practice’ sessions (Kabat-Zinn, 2003). An example of a mindfulness meditation is a mindfulness of the breath exercise. In a mindfulness of the breath exercise, individuals are encouraged to continually and non-judgmentally direct their attention towards sensations associated with breathing (Arch & Craske, 2006). The historical origins and health benefits of mindfulness will also be discussed.

Historically, mindfulness or the ability to increase awareness by paying attention in the present moment is rooted in a number of Buddhist traditions. Mindfulness has been described as being the ‘heart’ of many Buddhist teachings (Kabat-Zinn, 2003; Thera, 1962). Originating from within a religious context, the practice of mindfulness meditation has since been demonstrated to have significant treatment effects across a range of physical and psychological problems. Seminal research on the health benefits of mindfulness was Jon Kabatt Zinn’s (1982) Mindfulness Based Stress Reduction Program (MBSR). MBSR is an 8 week program of weekly classes involving formal mindfulness practices including; yoga-based stretching, psycho-education, sitting meditation, and a body scan, and group discussion (Carlson, Ursuliak, Goodey, Angen, & Speca, 2001; Hoffman, Ersser, Hopkinson, Nicholls, Harrington, & Thomas, 2012; Shapiro, Bootzin, Figueredo, Lopez, & Schwartz, 2003). MBSR has been found to be associated with benefits in chronic pain management, the skin condition – psoriasis, and the chronic
condition of fibromyalgia, immune response, insomnia, and emotional problems such as anxiety, stress, mood, and dietary compliance (Astin, 1997; Kabat-Zinn, 1982; Peterson & Pbert, 1992; Kabat Zinn et al., 1998; Kabat-Zinn, Lipworth, & Burney, 1985; Miller, Fletcher, & Kabat-Zinn, 1995; Saxe et al., 2001). The research regarding the efficacy of mindfulness based programs to treat anxiety disorders will also specifically be reviewed.

The literature suggests that mindfulness-based interventions are effective in treating anxiety disorders. Two meta-analyses have reviewed the efficacy of mindfulness-based therapy with anxiety disorders. Hofmann, Sawyer, Witt, and Oh (2010) analysed 39 studies and reported that overall, therapies based on MBSR or mindfulness based cognitive behavioural therapy (MCBT) produced medium to large anxiety treatment effects. More recently, Vøllestad, Nielsen, and Nielsen (2012) reviewed the efficacy of a group of therapies collectively referred to as mindfulness- and acceptance-based interventions (MABIS). MABIS consisted of MSBR, MCBT, acceptance based behaviour therapy (ABBT), acceptance and commitment therapy (ACT), mindfulness- and acceptance-based group therapy (MAGT), and mindfulness-based stress management (MBSM). MABIS each contain aspects of mindfulness and focus on facilitating a mode of ‘present-centred awareness’ (Vøllestad, Nielsen, & Nielsen, 2012. P. 240). Vøllestad et al.’s (2012) analysis comprised of 19 studies and reported a very large anxiety treatment effect. The results of each of these meta-analyses suggest that mindfulness meditation is a useful tool for the treatment of anxiety disorders. The efficacy of ‘third wave’ behavioural therapies containing aspects of mindfulness will next be compared to ‘second wave’ behavioural therapies.
2.17. Comparison of ‘second wave’ to ‘third wave’ behaviour therapy.

As previously stated, ‘second wave’ behavioural therapy or ‘CBT’ remains the ‘gold standard’ for the treatment of anxiety disorders across both adult and child populations (In-albon, 2007; Otte, 2011; The Australian Psychological Society [APS], 2010). However, there is a growing research base regarding that ‘third wave’ therapies are effective in treating a range of psychological disorders (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Ruiz, 2012; Swain, 2013). For example, a number of meta-reviews have drawn attention to the efficacy of ‘third wave’ therapy Acceptance and Commitment Therapy (ACT). Swain (2013) reviewed 38 studies and revealed that in all but three examples significant improvements were reported in a majority of anxiety outcome measures post-intervention. Effect sizes were reported to be generally in the ‘moderate’ range (Swain, 2013). Similarly, Ost (2008) reviewed 13 ACT and 13 dialectical behaviour therapy (DBT) studies and similarly reported treatment effect sizes in the moderate-large range. Ost reported an effect size of $g=0.68$ across 13 ACT studies, an effect size of $g=0.58$ across 13 DBT studies, and an effect size of 0.56 across the 26 ACT and DBT studies. These treatment effects were mirrored in an earlier meta-analysis which reported a treatment effect size across ACT literature of $g=0.66$ (Hayes et al., 2006). Collectively, this meta-data makes a strong case for better understanding third wave treatments for insight into how to maximize treatment outcomes over the current ‘gold standard’ CBT or ‘second wave’ treatment.

To this end, researchers have investigated whether ACT - the most commonly cited third wave behavior therapy - leads to greater treatment outcomes than do ‘second wave’ CBT interventions. The current state of the research suggests that there is little
difference between the two. A recent meta-analysis using 16 studies to compare ACT and CBT treatments reported that ACT outperformed CBT on ‘primary’ outcome measures (g=0.40) (Ruiz, 2012). These measures combined measures of anxiety and depressive symptoms. However, isolating either measures of anxiety or depression revealed no meaningful indication of difference between CBT and ACT outcome (g=0.14). The random controlled trials (RCTs) discussed in the meta-analysis were reported to typically report treatment effect sizes in the ‘moderate range’ for ACT (Ruiz, 2012). There was a positive trend for treatment efficacy for ACT on measures of depression but these did not reach statistical significance. Similarly, measures of quality of life outcome found ACT to be marginally statistically significant (g=0.25, p=0.07) but with any advantage seen to decrease at follow up (Ruiz, 2012).

Collectively, the body of ACT treatment outcome research has been criticized for having poor methodological rigour in comparison to ‘second wave’ CBT research. Ost (2008) developed a methodological rating scale with items such as attrition (percentage of those starting), number of therapy weeks, number of therapy hours, and follow up time. Ost (2008) reported that third wave (ACT and DBT) studies were on average significantly less stringent than comparable CBT studies. An updated comparison of the methodological rigour of ACT vs CBT studies has not been produced. However, recent review of ACT RCT’s suggests that methodological stringency could still be improved (Swain, 2013). Recently, a number of ACT random controlled trials of anxiety treatment were systematically reviewed and analyzed with the Psychotherapy Outcome Methodology Rating Form (POMRF) (Swain, 2013). In this review, 21 studies were included that were published between the years of 2009 and 2013. Of those 21 studies,
only 7 gained classifications of ‘above’ or ‘well above’ average. Fourteen, and the
majority of studies were classified as ‘below’ or ‘well below’ average. However, of the
ACT studies with ‘above average’ or ‘well above average’ POMRF classification, all
with the exception of Wetherhill et al. (2011) indicated significant improvement in the
majority of measures of anxiety (Swain et al., 2013). Criticisms of the methodological
rigour of ACT studies can, therefore, be seen to be at least partially substantiated.

2.18. Efficacy of ‘second wave’ behavior therapy (CBT) in treating children with
GAD

CBT has been found to be effective in treating GAD. Meta-analytic outcome data
from studies investigating the efficacy of CBT treatment for adults have revealed
significant symptom reduction with large effect sizes (Borkovec & Ruscio, 2001;
Cuijpers, Sijbrandij, Koole, Huibers, Berking, & Andersson, 2014). However, an issue
with CBT has been that high proportions of treated individuals fail to demonstrate high
end state functioning after treatment. One study found that just 42% of adults who were
treated with GAD maintained desirable outcome levels at 6 and 12 month follow up after
treatment (Butler, Fennell, Robson, & Gelder, 1991). Similarly, another reported just 58%
of patients with desirable functioning at 6 month follow up (Borkovec & Costello, 1993).
There has been limited research into the efficacy of ‘second wave’ behavioural therapy or
CBT to treat specifically GAD in children.

Few studies have specifically investigated the efficacy of CBT for treating
childhood onset GAD. With the exception of small case studies, only one study to date
has aimed to investigate the efficacy of CBT to treat children diagnosed with GAD.
treatment for GAD for use with children. A pilot study produced promising results. Remission of symptoms of worry and anxiety were reported with large effect sizes (Payne, 2011). However, the efficacy of CBT in treating childhood onset GAD remains largely unknown. Payne’s (2011) results were promising but with a sample of just 16 participants additional RCT’s are required. The overwhelming majority of treatment outcome data for child onset GAD comes from studies which have used manualized treatment programs to broadly treat anxiety across various diagnostic categories.

Manualized CBT treatment programs for children such as Rapee’s ‘Cool Kids’ (2000), and Shortt et al.’s (2001) ‘FRIENDS’ program have been shown to be effective in treating a range of anxiety disorders (Cartwright-Hatton et al., 2004; In-Albon & Schneider, 2007). It is estimated that 50-60% of children who receive CBT treatment from such a package will no longer meet the diagnostic criteria of an anxiety disorder after treatment (Cartwright-Hatton et al., 2004). GAD has been found to be among the most common of the anxiety disorders for children and one study found that 60% of the children participating in the study met the diagnostic criteria for GAD (Kendall, 1994). These figures suggest that manualized CBT programs probably are efficacious in treating childhood onset GAD. However, even if manualized CBT programs are effectively treating childhood onset GAD, there remains 40-50% of children for whom CBT treatment is not expected to be effective in ridding a child of an anxiety disorder. Of children presenting for anxiety treatment, 50 - 60% of these children are likely to meet diagnostic criteria for childhood onset GAD (Verduin & Kendall, 2003). The content of CBT anxiety treatment programs will also be discussed.
Manualized CBT treatment programs for children such as Rapee’s (2000) Cool Kids or Shortt and colleagues (2001) ‘FRIENDS’ program typically share a number of core components including psychoeducation, cognitive restructuring, imagined and in-vivo exposure, problem solving skills, and assertiveness training (Kendall, 1994; Rapee, 2000; Shortt et. al., 2001). There are a limited number of CBT treatments developed specifically to treat GAD.

There is a range of subtly different CBT treatment programs designed to specifically target GAD. The range of treatment programs is reflective of the diversity and variety of theoretical models of worry. CBT based treatment variations for GAD include Metacognitive Therapy for GAD (Wells & King, 2006), Emotion Regulation Therapy for GAD (Mennin, 2004), and a CBT treatment based around Dugas et al.’s (1995) notion of IU adapted for use in children by Payne (2011). The treatments have in common a component of psycho-education and an emphasis on monitoring psychological activity (See Behar et al., 2009 for a review). Evidence regarding the efficacy of third wave behavioural therapies to treat children with specifically GAD will also be discussed.

2.19. Efficacy of Third Wave Behaviour Therapy in treating children with Generalized Anxiety Disorder

It has been shown that there is limited data regarding the effectiveness of ‘second wave’ or CBT for treating children with specifically GAD. The research is in a similar state regarding the efficacy of third wave therapies to treat children with GAD.

There is evidence that third wave behavioural therapy ACT has been effective in treating children’s anxiety. ACT was successfully used to treat children and adolescents with Obsessive Compulsive Disorder in small case studies (Yardley, 2012; Armstrong,
There is also evidence that ACT has been successfully used to treat adolescents with depression (Hayes, Boyd, & Sewell, 2011), anxiety-based school refusal (Wilson & Coyne, 2003), anorexia nervosa (Heffner, Sperry, & Eifert, 2002), and chronic pain (Wicksell, Melin, & Olsson, 2007). However, there is a lack of evidence regarding the efficacy of third wave treatment approaches to specifically treat childhood-onset GAD.

The adult literature generally suggests that third wave behaviour therapies have potential for treating childhood-onset GAD. However, studies have produced mixed results. For example, in an RCT of ACT treatment that was independently rated as having ‘strong’ methodology, self-reported GAD symptom severity did not vary significantly between those receiving treatment and controls (Sachs, 2005). Similarly, in a study investigating the usefulness of ACT within an older population, self-report measures of anxiety did not differ within an ACT treatment group (Wetherell, et al., 2011). In each of these studies, however, there were measures of symptoms of GAD that did vary as a result of treatment. For example, in Sachs’ (2005) study, individuals receiving treatment were deemed by clinicians to have made clinically significantly improvement in GAD symptom severity even if self-report measures did not reflect a similar outcome. In Wetherell et al.’s (2011) study, measures of worry, a central symptom of GAD, were found to vary significantly after ACT treatment. Additional evidence highlighting the promise of third wave behaviour therapy as treatment for GAD are the results of a third study which investigated the efficacy of third wave ‘Acceptance Based Behaviour Therapy (ABBT) (Orsillo, Roemer, & Barlow, 2003). Post-ABBT treatment, 75% of participants reported a 20% or more decrease in anxiety symptomology.
One of the issues with CBT treatment for GAD has been the tendency for individuals to fail to maintain high end state functioning after treatment. (Borkovec & Costello, 1993; Butler, Fennell, Robson, & Gelder, 1991). Therefore, a key question in evaluating third wave behavior therapy’s potential usefulness in treating GAD will be data relating to the maintenance of functioning post-treatment. Two RCT’s featuring third wave treatments for GAD have reported on functioning after treatment. Roemer and Orsillo (2007) reported that 62.5% of individuals met criteria for high end state functioning which fell to 58.3% of participants at three month follow up. Orsillo et al. (2003) reported that 55% of their sample met criteria for high end state functioning directly following treatment. Orsillo et al.’s (2003) study was a pilot study with a small number of participants (n=4) that lowered the generalizability of the findings. Rationale for adapting third wave Acceptance Based Behavioural Therapy (ABBT) for use with children with generalized anxiety will also be discussed.

2.20. Acceptance Based Behavioural Therapy

Acceptance Based Behavioural Therapy (ABBT) is a ‘third wave’ treatment for GAD developed from Roemer and Orsillo’s (2002) Acceptance Based Model of Worry (ABM). ABBT claims to reduce worry by developing acceptance and mindfulness skills, by reducing experiential avoidance, and by increasing ‘valued’ action (Roemer et al., 2005; Roemer & Orsillo, 2007). As previously discussed, the ABM offers promise for treating GAD due to its provision of theoretical framework for analyzing the role that language plays in worry, its emphasis on internal and external experiences, and its consideration of ‘behaviour restriction’ (Roemer & Orsillo, 2002). Outcomes from initial investigation of the efficacy of ABBT to treat GAD were encouraging.
RCTs involving GAD treatment using ABBT have so far had promising results. One study found that after treatment, 78% of individuals no longer met diagnostic criteria for GAD and 77% achieved high end state functioning at 3 and 9 month follow up intervals (Roemer, Orsillo, & Salters-Pedneault, 2008). Other studies have also found that following ABBT, individuals have reported significant reductions in IU, fewer difficulties in emotional regulation (Treanor, Erisman, Salters-Pedneault, Roemer, & Orsillo, 2011), and increased mindfulness, and fewer symptoms of anxiety (Romeret al., 2009). Additionally, results of ABBT have revealed that treatment effects seem to maintain or increase at follow up intervals (Treanor et al., 2011, Roemer et al., 2009). These results were promising in light of earlier ‘second wave’ or ‘CBT’ studies reporting as few as 42% of individuals reporting high end state functioning after treatment (Butler et al., 1991). ABBT is also promising for adaptation for use with children struggling with chronic and excessive worry.

There are several reasons to consider adapting Roemer and colleagues’ (2005) ABBT for use with children experiencing generalized anxiety. Firstly, there is a need for continued development of treatment for all pediatric anxiety disorders. This is because for 40-50% of children, current CBT approaches are simply not effective (Cartwright-Hatton et al., 2004). Secondly, ABBT’s emphasis on language, objective experience, and behavioural restriction make it particularly suited to GAD treatment. Thirdly, as GAD is among the most common of the childhood onset anxiety disorders, development of new and effective treatments for children with GAD has the potential to positively impact on a large number of children. Developmental considerations involved in adapting an ABBT program for children will also be discussed.
2.21. Worry from a developmental perspective

The ability to worry develops with age throughout childhood (Vasey, 1993). The mean age of onset of GAD in children has been estimated to be about 8.5 years of age (Keller et. al. 1992; Last et al., 1992). In order to engage in the sort of pathological worry associated with GAD, children require the ability to perform two tasks. They must be able to both anticipate the future and be able to elaborate on a variety of alternative catastrophic possibilities (Vasey, 1993). In one study, the cognitive development of 248 children was measured along with their ability to elaborate on catastrophic outcomes. It was found that cognitive development was associated with children’s ability to elaborate on feared outcomes, and that the ability to elaborate on feared outcomes increased the probability that a child would experience a personal worry (Muris, Meesters, & Van Melick, 2002). This suggested that the capacity to engage in worry was something that developed with age throughout childhood. Cognitive abilities required to respond to treatment for pathological worry will also be reviewed.

There are cognitive abilities required for children to be able to engage in and benefit from psychological intervention for GAD. Both CBT and ABBT treatment approaches for GAD require individuals to be able to identify and gain insight into their thought activity (Dugas et al., 1998; Roemer & Orsillo, 2005, 2007). In a ‘second wave’ CBT approach, children are required to identify and analyze thoughts for possible cognitive distortion (Rapee, 2000). In an ABBT approach, children would be required to gain an awareness and insight into their thoughts and feelings and to change the way they relate to their thoughts and feelings (Roemer & Orsillo, 2002). The ability of children to
identify and gain insight into their own thoughts and feelings will be discussed with reference to the developmental literature.

The literature suggests that the ability to identify and gain insight into thought activity is something that, like worry itself, develops throughout childhood (Ellis & Hudson, 2010; Flavell, Green, & Flavell, 2000). In one study five year olds, eight year olds, and adults were asked to have no thoughts at all for a set period of time and report back on how successful they were. Not surprisingly, adults reported that they experienced thoughts despite their best attempts at restraining them. At the opposite end of the age range, five year old participants reported that they were successful in not having any thoughts. In the middle age range, the majority of eight year olds reported that they were aware of having thoughts. Some eight year olds, however, were still unable to recognise that they were still experiencing thoughts despite their efforts not to (Flavell et al., 2000). These results indicated that a proportion of eight year old children still have limited insight into their thinking and would be expected to struggle to engage in GAD treatment.

In another study, five year olds, nine year olds, thirteen year olds, and adults were also tested on their insight into their thought activity. This time, they were directly asked about their understanding of the uncontrollability of mental activity (Muris, Merckelbach, & Luijten, 2002). Results were consistent with Flavell et al.’s (2000) study and suggested that it is around nine years of age when children consistently begin to show evidence of reliable insight into their thought activity. These results have implications for the treatment of childhood onset GAD.

The emergence of children’s insight into thought activity at 8 years of age is consistent with the estimated mean age of onset of GAD of about 8.5 years of age (Masi
et al., 2004). This data indicates that there are likely to be children experiencing the pervasive and uncontrollable worry of GAD without the insight into thought activity required to benefit from CBT or ABBT treatment. The notion that young children may lack the insight into their thought activity required to benefit from treatment is consistent with developmental stage theory literature (Kuhn, 2008).

Piagetian developmental stage theory predicted that the ability of children to worry would develop through distinct operational stages (Piaget, 1970). For children aged from 7-11 years of age, children were hypothesized to be in the ‘concrete operational’ stage. It was asserted that children in this stage have deductive reasoning abilities but only a developing ability to understand more abstract concepts. The ability to reason with and understand more abstract concepts is not considered to develop until the ‘formal operations’ stage beginning at the age of 12 (Piaget, 1970, 1987). Many of the assertions made by Piagetian developmental stage theorists have been criticized for being overly simplistic and inconsistent with emerging research findings (Brown & Desforges, 2011). However, Piagetian developmental stage theory has been a prominent force in the developmental literature over the last 40 years (For a review, see Kuhn, 2008). Piagetian developmental stage theory is clearly in line with findings from Flavell et al. (2000) and Muris et al. (2002) that children 8 or 9 years of age would likely struggle with the abstract reasoning involving the identification and analysis of their own thought activity. Possible modifications to Roemer and Orsillo’s (2005, 2007) ABBT will be discussed in light of the difficulties that children may have in gaining insight into their thought activity.

Meeting the needs of children who struggle to identify or gain insight into their thought activity would be a challenge in administering an ABBT for children. One way in which anxiety treatment programs have been modified in the past has been to add an additional multisensory learning stimulus. Incorporation of pictures, visual memory aids, and concrete stimuli into CBT has been discussed as a means to improve treatment outcomes for children (Moree & Davis, 2010; Willner, 2006). Understanding of how multisensory learning stimuli may improve treatment outcomes is informed from evolutionary and cognitive branches of psychology, as well as from a tradition of applied practice in teaching children with learning disabilities.

2.23. Evolutionary perspective

It has been argued that perceptual and cognitive processes evolved and were optimally developed to process multisensory signals (Shams & Seats, 2008). Anecdotal support for this notion lies in the fact that many tasks associated with daily living involve tracking and localizing moving objects which rely on the processing of both visual and auditory information (Shams & Seats, 2008). If information processing is optimized with the use of sensory information from multiple modalities, then it would stand to reason that children would likely learn more effectively if learning stimulus were also provided from multiple sensory modalities. The notion that humans evolved to optimally process information through multiple sensory modalities is supported by studies within the neuroscience literature.
Neuroscience provides support for the notion that humans are optimizing their cognitive and perceptual faculties whilst receiving information from a range of sensory modalities. For example, when retinal projections of a ferret were directed not to the usual visual cortex but instead rerouted to the auditory cortex, cells in the auditory cortex were seen to function in patterns similar to those seen in the visual cortex (Sharma, 2008). The part of the brain initially thought to be reserved for the processing of sound was instead being driven by visual inputs. This finding suggested that sensory input is not processed, as once thought, by discreet circuitry responsible only for specific modalities. Rather, it suggested that sensory input had a significant influence on a range of different sensory structures in the brain (Sharma, 2008). This supports the notion that processing is evolved to function optimally with multisensory as opposed to single sensory input. Evidence that optimal sensory processing involves multiple sources of sensory input also comes from research with young children.

A study looking at the selective attention of young children provided more support for the notion that humans evolved to best process information coming from a variety of sensory modalities. The ability of five month old infants to learn novel rhythms was measured. Firstly learning was measured after exposure to two sources of sensory information simultaneously. Then, learning was measured after exposure to a single source of sensory stimulus. It was found that presentation of sensory information bimodally led to increased attention and ability to discriminate rhythms than did information presented in a single sensory mode (Bahrick, 2000). This finding presents further support that optimal processing occurs with input from multiple sensory modalities. The impact of incorporating multi-sensory learning stimuli in an anxiety
treatment program for children is also accounted for by theory within the ‘cognitive’ and ‘educational’ streams of psychology.

There are a number of theories that suggest that multi-sensory learning stimuli could improve treatment outcomes for an anxiety treatment program with children. A range of theoretical models including Paivio’s (1973, 1991) Dual Coding Theory claim to account for individual differences in how people learn. The evidence base behind this theory and the implications for incorporating multi-sensory stimuli in an Acceptance Based Behaviour Therapy program for children will be discussed.

2.24. Paivio’s (1973) Dual Coding Theory

Paivio’s (1973, 1991) Dual Coding Theory (DCT) suggests that multi-sensory learning stimuli could improve treatment outcomes for an anxiety treatment program with children. DCT suggests that there are two channels or ‘codes’ through which information is processed; a verbal channel which processes language and a nonverbal channel which processes imagery. DCT asserts that an individual’s encoding performance will be greater if information is able to be processed through both verbal and non-verbal channels (Clark & Paivio, 1991). For example, processing the word ‘tree’ alongside an image of a tree is thought to have the effect of increasing an individual’s recall ability over the presentation of the word ‘tree’ alone (Mayer & Anderson, 1991). DCT suggests that when skills are taught within an anxiety treatment program to children, it may be beneficial to incorporate visual as well as verbal learning stimulus simultaneously. DCT brings additional implications for an anxiety treatment program for children.

Paivio’s (1973) DCT also suggests that the accessibility or comprehensibility of material will in part be dictated by the imagery value or concreteness of the stimulus
(Clark & Paivio, 1991). Imagery value refers to the ease with which imagery is evoked from language. Concreteness refers to the degree to which information refers to tangible objects. The DCT asserts that the imagery value and concreteness of stimulus can influence learning because both the verbal and non-verbal information processing channels are connected via ‘referential connections’ (Clark & Paivio, 1991). The DCT suggests that language able to arouse imagery and images able to evoke tangible objects is processed more effectively by the use of referential connections (Clark & Paivio, 1991).

The specific mechanisms through which the imagery value and concreteness of language can impact learning performance will also be discussed.

The importance of imagery value and concreteness is reported to lie in the organizational capacities of the DCT’s non-verbal channel (Clark & Paivio, 1991). There is a saying that ‘pictures are worth a thousand words.’ An assertion of the DCT is that images can contain more detailed information that can words and can integrate parts of an event by processing and embedding images in greater imagined structures. For instance, in the case of a child imagining him/herself using a breathing technique in a shopping center, the image of attempting a breathing technique is integrated into a large pool of accumulated knowledge about shopping centers. The DCT asserts that the use of concrete words that denote tangible objects over more abstract words are likely to be more easily encoded as they are more likely to arouse corresponding images (Clark & Paivio, 1991).

The importance of the image-value or concreteness of language has specific implication for the delivery of an anxiety treatment program for children.

DCT suggests that in addition to benefits associated with providing multiple sources of verbal and non-verbal information, treatment efficacy may be enhanced by
providing a curriculum which uses language which readily elicits mental imagery and evokes images of tangible objects. Such a curriculum would, according to DCT, establish strong referential connections between nonverbal and verbal information processing channels and improve the accessibility and comprehension of difficult and abstract concepts (Clark & Paivio, 1991). Techniques and strategies to increase the concreteness and imagery value of a curriculum can be found within the educational literature.

Educational research has identified a number of teaching strategies that promote the arousal of mental imagery. Some of these include asking students to relate the meaning of content to students’ personal lives, relating content to current events, or asking students to construct internal images for the meaning of text (Pressley, Johnson, Symons, McGoldrick, & Kurita 1989; Clark & Paivio, 1991). Comparing content meaning to students’ personal lives and constructing mental images has been shown empirically to improve recall and improve comprehension in children (Presseley et al., 1989). Relating course content to current events has been shown to improve the clarity and concreteness of course material for university students (Murray, 1985). Through the assertion of dual coding channels for verbal and non-verbal material, and the existence of ‘referential connections,’ Paivio’s DCT clearly has implication for the design and delivery of an anxiety treatment program for children. The empirical support for the DCT will also be discussed.

There is sound support for the DCT’s claim of an additive effect on recall of processing both verbal and non-verbal stimuli concurrently. In one study, after successive presentation of pictures, repeated words, and picture-word combinations, it was found that participants recalled more items that were successively presented as picture-word
combinations than words alone (Levie & Lentz 1982; Najar, 1995). There is also sound support for the notion that concrete language and language high in imagery value is able to be processed through an additional non-verbal processing channel. Individuals with damage to their right hemispheres were found to perform significantly worse in recalling concrete words over individuals with typical brain function. The nonverbal processing channel is theorized by the DCT to increase recall through the processing of imagery elicited by concrete words (Clark & Paivio, 1991). Support for this notion was also provided from a study that involved participants with physical brain injury. In this study, individuals with lesions to their right hemispheres were found to perform significantly worse on the recall of concrete words over abstract words in comparison to individuals with typical brain function. The non-verbal channel is hypothesized to be in the right hemisphere of the brain (Villardita, Grioli, & Quattropani, 1988).

More support, albeit qualified, was provided for the existence of a non-verbal processing channel by a study that employed modern functional magnetic resonance imaging (MRI) techniques (Jessen et al., 2000). These techniques were used to observe in action the cortical regions of the brain responsible for the superior encoding of concrete words over abstract words. Results found greater activation in a number of areas within both the right and left hemispheres of the brain during encoding of concrete words (Jessen et al., 2000). This result provided strong support for the notion that there is a ‘concreteness effect.’ I.e. language referring to tangible objects appears to be processed differently from language that is more abstract in nature. It was reported that the MRI results made a single or exclusive theory of cognition unlikely (Jessen, et al., 2000).
There are competing theories of cognition that do not support the existence of separate non-verbal processing channels.

An alternate theory of cognition which does not support the existence of separate verbal and non-verbal processing channels is the Context-Availability Model (Schwanenflugel & Shoben, 1983). The Context-Availability Model claims that concrete words are processed more efficiently not because they are processed by a non-verbal channel but because they activate a broader contextual support of concrete terms (Schwanenflugel & Shoben, 1983; Soyu, 2014). Whilst there have been some findings supportive of the context-availability model, a number of studies are pointing towards an extension of the dual-coding model of cognition, or a combination of models as being most representative of experimental findings (Jessen et al., 2000; Kousta, Vigliocco, Vinson, Andrews, & Del Campo, 2011; Soylu, 2014). Overall though, DCT does contain qualified support. The current state of the literature suggests that DCT is a valid theory likely to be modified or elaborated upon in time.

2.25. Learning Style Theory

Research suggests that individuals vary in the way they learn according to a range of factors including information processing style, emotional factors such as motivation and persistence, environmental elements such as preferences in degrees of ambient light and noise, and sensory preferences to either visual, verbal, kinesthetic, or a combination of the three (Keefe, 1979; Kolb, 1985, Felder, 1998, Hawk & Shah, 2007). In exploring the issue of potential benefits of multisensory stimuli on learning performance, three major theoretical models of learning style will be evaluated. These models are; the Dunn and Dunn Learning Style Model (Dunn & Dunn, 2007; Williams, Brown, & Etherington,
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2013), the Visual, Aural, Read/Write, and Kinesthetic (VARK) model (Fleming, 2001), and the Felder-Silverman Learning/Teaching Style Model (Felder & Silverman, 1988).

The first model to be evaluated will be the Dunn and Dunn Learning Style Model.

The Dunn and Dunn Learning Style Model (Dunn & Dunn, 1975) comprises five learning style domains within which lie several elements. The five learning style domains are; Environment, Emotion, Sociological, Physiological, and Psychological (Dunn, 1990). Dunn defines Learning Style as ‘the way in which individuals begin to concentrate on, process, internalize, and retain new and difficult information (Dunn, 1990, p.353).

Elements within the physiological domain include perceptual preferences for learning and suggest that individuals can vary in their preferences for auditory learning, visual learning, tactical learning and kinesthetic learning. This has implication for the inclusion of a multisensory learning model in an anxiety treatment program. A model with tactile, kinesthetic, and visual components would theoretically have the best chance of catering for each student’s preferred learning style.

The Dunn and Dunn Learning Style Model is empirically well supported. Studies have measured the achievement of students whose instruction was matched to their learning style as defined by the Dunn and Dunn Learning Style Model. It was found that students’ achievement was appreciably higher when instruction was matched to their learning style (Dunn, Beaudry, & Klavas, 1989; Dunn, Griggs, Olson, & Beasly, 1995).

The second model to be evaluated, also claiming to account for individual differences in learning, is the VARK Model (Fleming, 2001).

The VARK model (Fleming, 2001) is another widely cited model of learning style (Leite, 2010; Hawk, 2007). The acronym VARK stands for visual, aural, read/write, and
Kinesthetic. The VARK measures learning style based on an individual’s preference for learning through one or more of the sensory modes. Fleming (2001) collected data indicating that 41% of the population had single style preference, 27% two preferences, 9% three and 21% a single preference (Fleming, 2001). The level of empirical support for the VARK will also be reviewed.

The VARK model has been criticized for a lack of empirical support (Leite, 2010). On review, the level of empirical support does seem to be conflicted. A principle component analysis using a questionnaire derived from the model produced only three principle components (Fleming, 2001). It would be expected that the four sensory variables described in the model would produce four corresponding principle components (Fleming, 2001). In contrast, a later factor analysis using a different dataset found that each of the visual, aural, read/write, and Kinesthetic factors of the VARK did adequately fit the available dataset (Leite, 2010). Conflicting empirical support means that currently, the level of empirical support for the VARK remains behind that of the Dunn and Dunn learning Style Model and remains limited. The third model to be evaluated, also claiming to account for individual differences in learning, is the Felder-Silverman Learning/Teaching Style Model (Felder & Silverman, 1988).

The Felder-Silverman Learning/Teaching Style Model asserts that an individual’s learning style can be deduced from preferences on five continuums; an active-reflective, sensing-intuitive, verbal-visual, sequential-global, and intuitive-deductive continuum (Felder & Silverman, 1988). The verbal-visual continuum is the most relevant in an investigation of the potential benefits of introducing a multi-sensory stimulus into an anxiety treatment program for children. According to the Felder-Silverman
Learning/Teaching style model, individuals will either have a preference towards either visual or verbal stimuli. This contrasts to the Dunn and Dunn Learning Model and VARK model which allow individuals to theoretically prefer visual and verbal stimuli. All three models, however, imply that in a group of students, some will have a preference towards learning from visual stimuli and some will have a preference towards learning from verbal stimuli.

The Felder-Silverman Learning/Teaching Style Model has, like the VARK, been subject to criticism regarding the level of its empirical support (Coffield, Moseley, Hall, Ecclestone, 2004). A questionnaire was developed from the Felder-Silverman Learning/Teaching style model called the Inventory of Learning Styles (ILS). The psychometric properties have been reported to be ‘psychometrically sound’ (Felder & Silverman, 1988). Additionally, the validity of each of the five learning style dimensions of the Felder-Silverman Learning/Teaching Style Model has been explored using the ILS. Cronbach alphas recorded for the ILS range from 0.41 to 0.70 (Van Zwanenberg, Wilkinson, & Anderson 2000; Zwyno, 2003). Cronbach alpha values between 0.6 and 0.7 have been said to be at the ‘lower limit’ of acceptability (Hair, Tatham, Anderson, & Black, 2006). Regarding specifically the dimension of most relevance for the development of an anxiety treatment program – the verbal-visual dimension, Cronbach alpha levels have ranged from 0.56 to 0.63 (Van Zwanenberg, Wilkinson, & Anderson, 2000; Zwyno, 2003). With the construct validity of the five learning style dimensions of the Felder-Silverman Learning/Teaching Style Model being measured to be within the lower limits of acceptability, the model falls within the same category as the VARK.
model in remaining behind the Dunn and Dunn learning Style Model in terms of total empirical support.

Each of the previously discussed models of learning style asserts that there are individual differences in the way that people learn. Each of the models also indicated individual variation in preference to visual and verbal stimulus. In the case of the VARK and Dunn and Dunn Learning Style model, kinesthetic, tactile, and auditory as well. This has an implication for the use of multisensory stimulus model within an anxiety treatment program. Having additional visual, kinesthetic, and tactile stimulus should increase the likelihood that the delivery of a program is matched to a student’s preferred learning style.

The impact of matching a curriculum to a student’s learning style has been seen to pay dividends in regards to student achievement (Dunn, Griggs, Olson, & Beasly, 1995). It is likely that the increased likelihood of matching a curriculum to children’s learning styles will also have benefit for an anxiety treatment program.

2.26. Use of multisensory stimulus for assisting children with learning disabilities

Multisensory learning stimulus is widely used by occupational therapists and teachers to assist children with learning disabilities (Campbell, Helf, & Cooke, 2008; Woodward & Swinth, 2002). One study investigated the use of multisensory training amongst 198 Occupational Therapists (OT’s) based in primary schools. It was found that therapists were making extensive use of multisensory interventions with their students and that the use of multisensory activities within the profession was greater than what was predicated from research (Woodward & Swinth, 2002). For example, 37% of OT’s reported using 5 or more multisensory activities per student, and of the 130 multisensory techniques documented by OT’s participating in the study, just 25 had previously been
documented. Examples of multisensory activities used by OTs to assist children with handwriting remediation and the number of OT’s who reported using this activity was as follows; Asking students to give a verbal description of letter shapes whilst they were being written (n= 129), Using a viscous substance such as shaving cream for finger writing (n=118), use of coloured or embossed lined paper (n=111), forming letters with fingers using clay (n=85), forming letters with pipe cleaners (n=30), and writing to music (n=9) (Woodward, Swinth, 2002). The use of multisensory activities has also been documented by primary school teachers.

There is a documented tradition of using visual, kinesthetic, auditory, and tactile approaches in the primary school classroom. The ‘Montessori Method,’ an educational program which uses a variety of multisensory activities, was documented more than a century ago and is currently still being administered (Montesorri, 1912; Montessori Australia Foundation). It has been found that the addition of multisensory activities to a curriculum can improve educational outcomes for students. For example, one study measured the effect of adding finger tapping exercises, letter formation into carpet squares, and the use of magnetic letters on the outcomes of an established remedial literacy program. It was found that reading accuracy scores were significantly higher for those children who were exposed to additional multi-sensory stimulus components (Campbell et al., 2008). The long and established tradition of using multisensory stimulus in education alongside evidence of its effectiveness presents a strong argument for introducing multisensory stimulus into an anxiety treatment program for children.

Research has also measured an effect of adding stimulus of multiple sensory modality to
an individual’s ability to recall information. This research will also be reviewed in the context of incorporating multisensory learning stimulus to an anxiety treatment program.

### 2.27. Multisensory learning stimulus and recall

Research suggests that incorporating additional multisensory stimulus within an anxiety treatment program is likely to increase participants’ ability to recall information presented in treatment sessions. In one study, adding visual or auditory multisensory components to news stories was found to improve participant recall over single sensory modalities (Frieske & Park, 1999). In another, participants were asked to recall words after they were presented either bi-modally (visually and with audio) or uni-modally. Recall performance was increased after bi-modal presentation (Kobus, Moses, & Bloom, 1994). In a third study, visuals presented with matching words or sounds (e.g. a dog matched with a ‘bark’ noise) were better recalled than visuals presented without matching words or sounds (Lehmann & Murray, 2005). These findings provide clear evidence that the incorporation of a multisensory stimulus within an anxiety treatment program would be likely to increase participants’ ability to recall information presented in treatment sessions.

The body of evidence from evolutionary and cognitive streams of psychology, learning style research, educational tradition, and experimental studies demonstrating benefit to recall together suggest that the use of multisensory learning stimulus may improve treatment outcomes of an ABBT program. Finally, with regards to the delivery of an ABBT program, a number of ‘delivery factors’ purported to influence treatment outcome have been identified. Two delivery factors will briefly be reviewed.

### 2.28. Treatment Delivery Factors
Delivery factors of ‘length of treatment’ and whether treatment was in ‘group’ or ‘individual’ format have been shown to have a bearing on the efficacy of anxiety treatment programs for children (In-Albons, 2007; Ishikawa et al., 2007; Reynolds, 2012). One meta-analysis identified an optimal treatment length to be 13-16 hours (Reynolds, 2012). Within this review, treatments between 13 and 16 hours of duration were reported to be associated with large effect sizes. In contrast, treatments of briefer duration of between 5 and 8 hours were associated with ‘medium-large’ treatment effects. Another meta-analysis categorized CBT RCTs as containing ‘10 or fewer sessions,’ or having ’11 or more sessions.’ It was found that studies with ’11 or more sessions’ were associated with larger treatment effects (Ishikawa et al., 2007). RCTs with fewer than 10 treatment sessions were associated with moderate treatment effects. RCTs with more than 10 treatment sessions were associated with a larger moderate- large treatment effects.

Overall, meta-analytic data suggests that an optimum length of an ABBT program would be a treatment of 13-16 hours with at least 11 sessions. Another treatment delivery factor to be discussed is whether individual treatment delivery is more effective than treatment delivered in a group format.

There is evidence that individual treatment delivery is more effective than treatment delivered in a group format. Reynolds’ (2012) meta-analysis compared two groups of RCTs; one group in which CBT interventions were delivered in a group format, and another in which interventions were delivered individually. Individually delivered treatments were, overall, reported to be associated with large effect sizes. Treatments delivered in a group format were reported to be associated with smaller medium effect size (Reynolds, 2012). Other meta-analyses reported a more marginal impact of
individual treatment vs. group treatment format type. In-Albons (2007) reported very large effect sizes across both group and individually delivered treatments. Treatments delivered in a group format were reported to have a very large effect size. Individually delivered treatments were found to be associated with similarly ‘very large’ effect size (In-Albon, 2007). Another meta-analysis reported similar findings. Ishikawa and colleagues (2007) reported individually administered CBT treatments to be associated with a medium-large treatment effect (Ishikawa et al., 2007). Treatments administered in a group format were associated with only a slightly weaker effect. Of the three meta-analyses cited, it was Reynolds’ (2012) findings which have the strongest validity. Reynolds’ (2012) analysis included close to three times the number of studies as In-Albon’s (2007) and Ishikawa’s (2007). Reynold’s meta-analysis featured 49 RCT’s whereas In-Albon’s (2007) and Ishikawa’s (2007) comparisons included 16 and 19 RCT’s respectively. Overall, the evidence indicates that there does seem to be benefit of administering anxiety treatment individually over administration in groups. Finally, there is anecdotal evidence that the personal experience of mindfulness teachers/facilitators may have an impact of an anxiety treatment program incorporating mindfulness.

Jon Kabat-Zinn (2003) – an author of several seminal studies on the benefits of MBSR has emphasized the need for teachers or facilitators of mindfulness meditation to be personally practicing mindfulness meditation themselves; ‘In our experience, unless the instructor’s relationship to mindfulness is grounded in extensive personal practice, the teaching and guidance one might bring to the clinical context will have little in the way of appropriate energy, authenticity, or ultimate relevance, and that deficit will soon be felt by program participants’ (Kabat-Zinn, 2003, p. 150). This anecdotal evidence suggests
that an anxiety treatment program incorporating elements of mindfulness might be most
effective if administered by facilitators who are personally engaged in regular
mindfulness meditation themselves.

2.29. Research Questions

The proposed research contains the following three hypotheses:

Hypothesis 1. A ‘third wave’ ABBT treatment for children will be effective in
reducing anxiety and worry in children as measured by a decline in child and parent
reported symptoms of generalised anxiety.

Hypothesis 2. An ABBT treatment for children using a tactile stimulus will
improve treatment outcomes over ABBT treatment not including a tactile stimulus.

Hypothesis 3. Reduction in children’s reported levels of anxiety and worry will
be associated with both a reduction in measures of experiential avoidance and fusion, and
an increase in measures of acceptance and mindfulness.

CHAPTER 3 - METHOD

3.1. Participants

Fourteen children ranging in age from 7 to 11 years of age participated in anxiety
treatment programs. The participant pool consisted of 10 boys and 4 girls. Informed
consent was obtained from a parent of each child and informed assent was obtained from each child. Exclusion criteria included previous diagnosis of an Autistic Spectrum Disorder, a diagnosis of a language delay, or a diagnosis of a global delay.

3.2. Sampling procedure

Participants were recruited from school counsellors in local primary schools as well as through flyers posted on community notice boards. Flyers were also distributed to local medical centers. Flyers promoted the program as a ‘skills-based’ program for children who worried excessively. Treatment programs were fully approved by the University of Western Sydney Ethics Human Research Ethics Committee (approval number: H10330 13/010998) and participation involved no cost for participants. A copy of the flyer used to recruit participants can be found in Appendix A.

3.3. Sample size, power, and precision

Participants were randomly allocated to one of two anxiety treatment program-type conditions. Seven participants were initially allocated to each treatment condition. Due to participant drop-out however, seven and four children respectively remained at cessation of the programs.

This sample size of 14 children was determined after choosing to administer an acceptance based behavioural therapy ‘pilot study’ for children. It was hypothesized that there would be large pre–post effect sizes on measurements of anxiety and that a sample size of 14 would be sufficiently powerful to detect this.

The study was also designed in a way that the efficacy of two active treatment conditions could be compared. An ABBT treatment with a multisensory learning model was administered in addition to an ABBT treatment without a multisensory learning
model. It was hypothesized that the sample size would likely be insufficient to detect group difference in treatment outcomes between the two active ABBT treatment conditions. However, a design involving ABBT with a learning model and an ABBT without a learning model was justified for the clinically relevant anecdotal information that would be learned from running the two treatments concurrently. To have sufficient participants to be able to detect differences between two active ABBT treatments was considered to be outside the scope of a ‘pilot study’ and outside the scope of a Master of Arts – Psychology (Honours) research project.

3.4. Measures and Covariates

Spence Children’s Anxiety Scale – Parent version (SCAS-P). The SCAS–P was selected as the primary treatment outcome measure. The SCAS-P was administered to parents to assess the severity of their child’s anxiety symptoms. The scale assesses six domains of anxiety based on the dimensions of anxiety within the Diagnostic and Statistical Manual, 4th Edition (DSM-IV). The scale additionally features a measure of ‘total’ anxiety symptoms. The six specific domains of anxiety assessed included; generalized anxiety, panic/agoraphobia, social phobia, separation anxiety, obsessive compulsive disorder, and physical injury fears. The SCAS-P was deliberately chosen as the primary treatment outcome measure over child-report questionnaires as research suggested that children tend to report both fewer symptoms and are less reliable in reporting the details of anxiety symptoms than their parents (Grills & Ollendick, 2002).

The SCAS -P is cost and time effective to administer and has been found to have both good retest reliability and adequate convergent and discriminate validity (Nauta, Scholing, Rapee, Abbott, Spence, & Waters, 2004; Spence, 1998). A limitation of the
measure is that a relatively low amount of unique variance is accounted for by the sub-scales of specific forms of anxiety – eg. Generalized Anxiety Disorder (Spence, 1997).

Consistent with this limitation, the SCAS-P has been found to be unable to discriminate individuals with GAD from individuals with other types of anxiety disorders (Nauta, et. al., 2004).

**Spence Children’s Anxiety Scale – Child version (SCAS-C).** The SCAS-C was used to measure self-reported symptoms of anxiety by participating children. The SCAS-C is similar to the SCAS-P in that it also reports on a measure of ‘total’ anxiety and six specific domains of anxiety including: generalized anxiety, panic/agoraphobia, social phobia, separation anxiety, obsessive compulsive disorder and physical injury fears. The internal consistency of the total score and sub-scales was reported to be ‘high’ and test–retest reliability to be ‘satisfactory’ (Spence, Barrett, & Turner, 2003). As was the case with the SCAS-P, a high level of correlation was found between measures of the six different specific subtypes of anxiety suggesting that the ‘total’ anxiety measure may be more sensitive to treatment effects than measures of the six specific subscales (Spence, 1998).

**Penn State Worry Questionnaire – Child (PSWQ-C).** The PSWQ-C was chosen to measure the severity of children’s worry (Chorpita, Tracey, Brown, Collica, & Barlow, 1997). The PSWQ-C has excellent retest reliability and good convergent and discriminant validity (Chorpita, et. al., 1997). The PSWQ-C differentiates itself from the SCAS in being particularly sensitive to individual’s experience of chronic and persistent worry; The PSWQ-C has, unlike the SCAS-P, been found to be able to discriminate
individuals with GAD from individuals with other types of anxiety disorders (Chorpita et al., 1997).

**Strengths and Difficulties Questionnaire (SDQ).** Childhood anxiety disorders have been associated with low self-esteem, impaired social functioning, and problems with concentration. As a result, the SDQ was chosen to screen for additional effects of anxiety treatment (Ialongo, et al., 1996; Strauss, Frame, & Forehand, 1987). The SDQ produces a ‘Total Difficulties’ score and six ‘subscale’ scores. Subscales include ‘Emotional Symptoms’, ‘Conduct Problems’, ‘Hyperactivity’, ‘Peer problems’, and a ‘Prosocial’ subscale (Goodman & Scott, 1999). The SDQ has sound psychometric properties including strong test re-test reliability and strong concurrent validity (Goodman, 200; Goodman & Scott 1999).

**Avoidance and Fusion Questionnaire for Youth (AFQ-Y).** The AFQ-Y was used to measure cognitive fusion - an aspect of a child’s relationship with their internal experiences, experiential avoidance, and behavioural ineffectiveness (Greco, Lambert, & Baer, 2008). The AFQ-Y has ‘very good’ internal consistency and strong convergent validity (Greco, et al., 2008). A limitation of the AFQ-Y is that it was developed using children older than those participating in the present study and there has been as yet no assessment of its validity with younger children. The scale was developed using 6th to 8th graders who had a mean age of 12.7 years (Greco, et al., 2008). Participants in the current study ranged from 7-11 years old with four of the original 14 participants in the present study were just 7 years of age. There is no psychometric data on the AFQ-Y with the use of younger children of the age of many of those participating in the present study.
Child Acceptance and Mindfulness Measure (CAMM). The CAMM was used to measure levels of mindfulness and acceptance or the quality of a child’s relationship with their internal experiences. The CAMM has demonstrated ‘good’ internal consistency and ‘good’ concurrent validity (Greco, Dew, & Ball, 2005). A limitation of the CAMM shared with the AFQ was the development of the scale with children generally older than those in the present study. The CAMM was developed with participating young people with a mean age of 12.1 years. Similar to the CAMM, there is to the author’s knowledge no psychometric data on the use of the CAMM with younger children of the age of many of the participants of the present study.

Program Evaluation Questionnaire. A questionnaire was created and administered to parents at the completion of each child’s participation in the research. The questionnaire was developed in order to receive feedback on aspects of the program including the treatment facilitator’s capacity to build rapport with the children, whether the learning activities were set at an appropriate level of difficulty, and whether the quantity of practice (homework) tasks being assigned was at a realistic and manageable level. The program evaluation questionnaire also included questions asking the following; ‘Did any component(s) of the program stand out as being especially helpful for your child?’; ‘How helpful was the ‘Wilson’ learning model. How did it help your child to manage his/her worry?’; ‘Which strategies did you see your child use to manage his/her anxiety/worry?;’ and ‘How could the program be improved?’

3.5. Research design

A pretest-posttest independent groups design was used in which fourteen children were randomly allocated to one of two treatment conditions. Seven children were
allocated to an Acceptance Based Behavioural Therapy (ABBT) program incorporating a multisensory learning model. Seven children were allocated to an ABBT program without the incorporation of the multisensory learning model. Treatment condition served as the study’s independent variable.

The study’s dependent variables consisted of scores on a number of questionnaires. The study’s primary dependent variable was the Spence Children’s Anxiety Scale – Parent (SCAS-P). Scores on the following questionnaires served as additional dependent variables; The Spence Children’s Anxiety Scale – Child (SCAS-C), Penn State Worry Questionnaire – Children’s adaptation (PSWQ-C), Avoidance and Fusion Questionnaire for Youth (AFQ-Y), Child Acceptance and Mindfulness Measure (CAMM), and the Strengths and Difficulties Questionnaire (SDQ).

3.6. Experimental manipulations or interventions

Participants participated in either an ABBT program incorporating a multisensory learning model, or an ABBT program without a multisensory learning model. The experimental manipulation was the presence or lack thereof of a multisensory learning model. The two treatment conditions are described below.

Acceptance Based Behavioural Therapy (ABBT) program incorporating a multisensory learning model. The group treatment program incorporating a multisensory learning model ran for one hour each week for seven consecutive weeks. Whilst the literature does indicate benefit in extended treatment delivery in an individual format, a shorter group delivery was chosen for pragmatic reasons. A seven week treatment with an extra week for scoring questionnaires allowed treatment to fit inside a single NSW school term. It was thought that running the program into a school holiday
period may have resulted in increased absenteeism as families travelled during the school term break. The decision to administer the program in a group format was made to ensure that there would be sufficient numbers of participants to make statistical comparisons between pre-test and post-test outcome measures.

The treatment program incorporated mindfulness activities, psycho-education, relaxation, value clarification activities, cognitive therapy principles, gradual exposure, problem solving skills, and use of the multisensory learning model to build understanding of notions of defusion and acceptance. Parents were present during each of the treatment sessions. A description of the multisensory learning model is provided below.

**The multisensory learning model.** A multisensory learning model was integrated into the Acceptance Based Behavioural Therapy (ABBT) treatment in one of the two treatment conditions. Features of the multisensory learning model included a handle, rubber conveyor-belt, clips to hold cards, and a model head. Figure 1 is an image of the multisensory learning model.

Figure 1: Multisensory Learning Model
The learning model was used to help participants understand concepts of acceptance and defusion. Participants wrote down catastrophic outcomes associated with worries onto ‘thought cards’ which were clipped on to the model’s conveyor belt. To reinforce notions of acceptance, participants were instructed to imagine discomfort whilst turning the model’s handle. Turning the handle sent the thoughts cards around the model’s head. This movement was presented as symbolic of thoughts moving into and out of awareness. Participants were encouraged to see the thoughts written on their thought cards as just ‘everyday events’ and not necessarily true. After imagining discomfort and watching thoughts move into and out of ‘awareness’, participants were then asked to let go of the handle and simply notice the thought cards remaining on the conveyor belt as they directed their attention to whatever they were doing at the time. Figure 2 shows an image of the learning model’s handle being turned.
Children were also given a worksheet with the following simple instructions:

1. Imagine yourself turning Wilson’s handle over and over again.
2. Simply notice feeling bad
3. Imagine letting go of Wilson’s handle and notice the worried thoughts remaining on the conveyor belt.

**Program Outline.**

Week 1: Psycho-Ed thoughts, feelings, and mindfulness.

Week 2: Mindfulness and physiological symptoms of anxiety.

Week 3: Values clarification and mindful thinking.

Week 4: Introduction to gradual exposure and the multisensory learning model.

Week 5: Psycho-Ed worry, acceptance, and defusion.

Week 6: Problem solving skills, acceptance, and defusion.
Week 7: Goal setting, acceptance, and defusion.

Week 8: Relapse prevention and celebration.

**Week 1: Psychoeducation- thoughts, feelings, and mindfulness.**

*Rapport building activity.* Children were seated on the floor in a circle and asked to volunteer their name, favourite animal, and their favourite food to the group. Children then paired up and played games involving kicking balloons to each other whilst lying on the floor.

*Introduction to mindfulness.* The concept of ‘inside world’ was introduced to the participants consisting of thoughts, feelings, and images. It was explained that as a group we would be building awareness of our ‘inside worlds.’ The analogy of being able to see fish and coral whilst snorkeling was presented as being symbolic of becoming more aware of thoughts and feelings. This analogy was used for its imagery-value. Snorkeling equipment was also used as a prop to help increase engagement and concreteness.

*Psychoeducation – feelings.* Information about feelings was presented. It was explained that feelings could vary in intensity and that feelings were often identifiable from facial expressions. Children were asked to list as many feelings as they could on a worksheet. Children also drew ‘feeling scales’ to demonstrate the variation in intensity of feelings for different situations. The children also participated in an activity where they acted out various feelings using facial expressions in front of the group.

*Psychoeducation – thoughts.* Information about thoughts was presented. It was explained that thoughts could be described as the ‘voice in our head’ and that they weren’t always easy to control. Comic strips and ‘thought bubbles’ were used to help children relate to the concept of thoughts. Children drew comic strips with ‘thought
bubbles’. To help to demonstrate the uncontrollability of thoughts, children were then asked not to think about chocolate cake. Children were also asked to notice their thoughts as the treatment facilitator slowly asked questions to the children. The participants’ experience was then discussed within the group.

*Mindfulness exercise – mindfulness of the breath.* Children were introduced to and participated in a session of five minute ‘mindful breathing’ meditation activity in which they were asked to continually draw their attention towards their breath.

*Assignment of homework tasks.* Homework tasks were described as ‘practice tasks.’ Participants were asked to complete 5 minutes of mindful breathing every day. Children were handed out homework log sheets and instructed to record each time they completed the practice task.

**Week 2: Mindfulness and physiological symptoms of anxiety**

*Rapport building activity.* Children were seated on the floor in a circle and asked to nominate their favourite time of the day. Children then broke into teams and played a game with table tennis balls and straws. The game required players to direct a ball through goal posts by blowing air onto balls through straws.

*Discussion - mindfulness.* Difference between ‘inside’ vs ‘outside’ world was discussed and the analogy of under/above water was reinforced.

*Psychoeducation – physiological symptoms of anxiety.* Children were introduced to a small wooden manikin and a discussion was had about some of the physiological signs of anxiety. Participants were then given worksheets which had an illustration of the manikin. As a group, children brainstormed physiological signs of anxiety and either wrote words or drew pictures to represent the various symptoms on their worksheets. For
example, students drew butterflies over stomach area, drew tears, or wrote ‘headache’ or ‘tired’ over the illustration of the wooden manikin.

*Mindfulness Activity.* Participants were introduced to the analogy of ‘inside worlds’ as being analogous to the weather. It was explained that thoughts and feelings were a lot like the weather. It was explained that like the weather, thoughts could sometimes be considered ‘sunny’ and ‘breezy’, and at other times ‘stormy’ and uncomfortable. It was explained that, like the weather, it was not always possible to control thoughts and feelings. Children were also told that uncomfortable thoughts and feelings, just like the weather, always passed. Children were asked to illustrate an example of ‘anxious’ and ‘uncomfortable’ weather and then ‘happy’ and ‘relaxed’ weather. Children were finally asked to draw matching thoughts next to their weather illustrations. For example, next to their illustration of a sunny day, children would write down ‘happy’ thoughts.

*Mindfulness exercise.* Participants were asked to sit and reflect on their current mood or their ‘weather.’ Participants were asked sit still and take note of their weather for 5 minutes before drawing an illustration of their ‘weather’.

*Assignment of homework tasks.* Participants were asked to engage in 5 minutes of mindful breathing meditation every day. Participants were also asked to complete a ‘daily weather’ worksheet requiring participants to identify, draw, and comment on associated physiological signs of anxiety each day.

**Week 3: Values clarification and mindful thinking.**

Values clarification activity. Children were asked to imagine that they had a magic wand and how they would ‘like things to be different.’ Children were then asked to consider what was important to them. Afterwards, children were given a worksheet with several boxes within each a value was written. For example, values included ‘being a good friend’ and ‘trying my best in class.’ Children were asked to reflect on and colour in the boxes of the five values that they considered to be most important to them.

Psychoeducation – thoughts. Information about thoughts was reinforced. Participants engaged in an activity where they were encouraged to define a thought. Comic book characters and thought bubbles were reintroduced to aid comprehension.

Thinking worksheet. Children were given a worksheet which required them to identify their thinking in anxiety-provoking situations. The worksheet also asked for reflection on what may happen if a thought was ‘believed’ or conversely, was not believed. Children were asked to identify what they could do to bring their behaviour more in line with their values. Children were encouraged to complete these worksheets with the assistance of their parents.

Discussion – defusion. Participants were encouraged to see thoughts and just everyday events and not necessarily true. The facilitator described the benefit of seeing thoughts as just everyday events. It was explained that seeing thoughts as simply everyday events may allow children to more freely pursue activities and goals that were important to them.

Assignment of homework tasks. Participants were asked to complete five minutes of mindful breathing every day and to complete three ‘thinking worksheets’ with the assistance of their parents.
**Week 4: Introduction to gradual exposure and the multisensory learning model.**

*Rapport building activity.* Participants completed worksheets which required them to brainstorm suitable and practical rewards that could be useful for gradual exposure exercises. This worksheet was completed by children with the assistance of parents.

*Creating list of worries and fears.* Participants completed worksheets in which they were required, with the assistance of their parents, to come up with a list of activities or situations that would provoke a degree of anxiety or discomfort. Participants were then asked to put a worry ‘rating’ next to each item ranging from 0-10 describing the degree of anxiety or worry the activity was likely to provoke.

*Create gradual exposure plan.* Participants were given worksheets in which they had to create gradual exposure plans. Participants listed activities on the worries and fears list from easiest to hardest. Participants completed a separate plan for each significant worry or anxiety-provoking situation. Participants completed these plans with the assistance of their parents and were encouraged to develop 2-3 plans.

*Introduction to multisensory learning model.* Participants were briefly introduced to the multisensory learning model. The various components – handle, belt, head, and ‘thought cards’ were introduced. The movement of the various components of the model was demonstrated and it was explained that the model would be used to help manage worry. The learning model was introduced with the name ‘Wilson.’

*Assignment of homework tasks.* Participants were encouraged to continue with mindful breathing activities and begin working through gradual exposure plans with their parents.
Week 5: Psychoeducation - worry, acceptance, and defusion.

Rapport building activity. Children participated in a ‘Simon Says’ game whereby children followed the hand movements of the facilitator.

Psychoeducation – worry. Participants completed two worksheets. One required them to illustrate a situation in which they were worrying. Children were then required to add in a ‘thought bubble’ expressing their worry in language. Children also completed a worksheet with instructions on how to choose not to worry with the aid of the multisensory learning model (Wilson). The instructions were as follows:

4. Imagine yourself turning Wilson’s handle over and over again.

5. Simply notice feeling bad

6. Imagine letting go of Wilson’s handle and notice the worried thoughts remaining on the conveyor belt.

Participants were then asked to write down at the bottom of the worksheet examples of worrying thoughts from their own personal experiences.

Gradual exposure plans activity. Participants spent time refining and modified gradual exposure plans with the assistance of their parents.

Acceptance and defusion activity with the multisensory learning model. Whilst gradual exposure plans were being modified, each child and parent completed an individual activity with the treatment facilitator in turn. Children were asked to think of a current worry and write down on ‘thought cards’ the catastrophic outcomes associated with that worry. It was explained to the children that the process of ‘thought cards’ moving around the model was akin to engaging in worry. Participants were instructed to clip the cards into the conveyor belt of the multisensory learning model and were taken
through the instructions on their worksheet. This involved children turning the model’s handle, pretending to notice feeling ‘bad’ and letting go of the model’s handle. Children were prompted to take note of the fact that when they stopped turning the handle their worrying thoughts remained on the conveyor belt. It was explained that whilst it was not possible for the thoughts to disappear – it was possible to just notice them without engaging in them. It was explained that once uncomfortable thoughts were in awareness without being engaged, the children could redirect their awareness to whatever it was that they were previously doing. Figure 3 shows the multisensory learning model and the yellow ‘thought cards’ on which participants were instructed to write down thoughts.

Figure 3: Multisensory Learning model with thought cards

Assignment of homework tasks. Participants were asked to complete five minutes of mindful breathing each day and continue to work on their gradual exposure plans.
**Week 6: Problem solving skills, acceptance, and defusion.**

*Problem solving worksheet.* Participants completed a worksheet requiring them to brainstorm solutions to a problem before assessing each solution and choosing the optimal solution. Children completed worksheets with the assistance of their parents and were asked to continue developing and refining gradual exposure plans when completed.

*Acceptance and defusion activity with the multisensory learning model.* The facilitator completed an individual activity with each child and parent using the multisensory learning model whilst problem solving worksheets were being completed. Children were asked to think of a current worry, write down catastrophic outcomes onto ‘thought cards’ and clip the cards to the ‘Wilson’ model’s conveyor belt. Children were taken through the instructions on their worksheet just as they were in the previous week. This activity involved children turning the model’s handle, pretending to notice feeling ‘bad,’ and letting go of the model’s handle. Children were also reminded to notice the worrying thoughts remaining on the model’s conveyor belt. For this week’s activity, participants were asked; “When you notice these unpleasant thoughts after you have let go of the handle, does that mean that these things will happen?” and “We’ve let go of the handle and we’re aware of feeling bad. We notice a thought pops up – does that mean that it is true?” This questioning was designed to help children to defuse from their thoughts and to begin to see thoughts and just everyday events and not necessarily true.

*Assigned H/W.* Participants were asked to continue completing 5 minutes of mindful breathing each day and continue progressing through their gradual exposure plans.
Week 7: Goal setting, acceptance, and defusion.

Rapport building activity. Children participated in a ‘Simon Says’ game whereby children followed the hand movements of the facilitator.

Value clarification and goal setting activity. Participants were given a blank sheet of paper and asked to draw or write down personal strengths and things in their life that were important to them. Following this, the children were asked to create a ‘special goal’ to work towards. It was emphasized that this goal was not to be for the benefit of teachers or parents but pursued freely for the purpose of pursuing activities they saw as important.

Relaxation activity. Participants completed a guided progressive muscle relaxation meditation activity.

Acceptance and defusion activity. Participants were asked to complete a worksheet requiring them to draw a picture and label various aspects of the multisensory learning model (Wilson). The worksheet required participants to reflect on how each of the parts of the model were able to help understanding of acceptance and defusion (seeing thoughts as just everyday events and not necessarily to be believed).

Week 8: Relapse prevention and celebration.

Complete Questionnaires. Children and parents began the session by completing the various post-test questionnaires. Parents were also asked to complete evaluation forms.

Relapse prevention discussion. Participants were reminded that they now had a variety of tools to manage fears and worries. The children were encouraged to speak to an adult if their worries were starting to bother them or stop them from doing the things that
were important to them. Children and parents were also encouraged to consider revisiting gradual exposure plans and thinking sheets in the future.

*Celebration.* The program concluded with a party for the children.

**Acceptance based behavioural therapy (ABBT) program not including the multisensory learning model.** The second ABBT group treatment program that did not include the learning model substituted activities using the learning model with visualization exercises. The ABBT program using the multisensory learning model incorporated a worksheet with the following instructions.

1. Imagine yourself turning Wilson’s handle over and over again.
2. Simply notice feeling bad
3. Imagine letting go of Wilson’s handle and notice the worried thoughts remaining on the conveyor belt.

The ABBT program *without* the learning model incorporated the following alternate instructions:

1. Notice any worrying thoughts and feelings of discomfort.
2. Notice the emotional ‘wave’ in the room with you
3. Gently allow yourself to continue feeling bad and pay attention to what you were doing.

Participants in both programs were asked to list worrying thoughts. The key differentiation between the programs was the incorporation of the multisensory learning model.
CHAPTER 4 – RESULTS

4.1. Statistical Analysis

The non-parametric Wilcoxon related samples signed rank test was chosen to analyse treatment effects on a range of outcome variables including the Spence Children’s Anxiety Scale – parent and child versions (SCAS), the Penn State Worry Questionnaire – Child (PSWQ-C), the Strengths and Difficulties Questionnaire (SDQ), the Avoidance and Fusion Questionnaire for Youth (AFQ-Y), and the Child Acceptance and Mindfulness Measure (CAMM) (Wilcoxon, 1945). The Wilcoxon test was chosen over the more powerful repeated measures t-test because an assumption of the student’s t-test is that data be normally distributed. The present study’s sample size (n=11) was insufficient to determine if participant questionnaire scores were normally distributed (Hills, 2008). It should be noted that the data of a single participant’s was excluded after the difference
between pre-test and post-test scores were identified to be within an ‘outlier’ range of more than two standard deviations from the mean (Hills, 2008).

As a pilot study with a small sample size (n=11), there was insufficient statistical power to compare the ‘with learning model’ and ‘without learning model’ treatment effects (Cohen, 1988). Meta-analytic data has shown that comparison of two active anxiety treatments has been found to produce significantly more marginal effect sizes than have comparisons of passive to active treatments (Reynolds, 2014). Notwithstanding, mean reductions in primary measures of GAD symptomology were tabulated and compared across each treatment condition.

4.2. Primary measures of GAD symptoms

**Penn State Worry Questionnaire – Child Adaptation (PSWQ-C).** A Wilcoxon related samples signed rank test revealed medium-large and significant pre to post treatment effects (z=2.21, p=0.03; r=0.41) for children in the ‘ABBT with learning model’ treatment condition. Large treatment effects were of marginal significance (z=1.60, p=0.11; r=0.74) for children who received the ‘ABBT without learning model’ treatment condition.

**Spence Children’s Anxiety Scale – Child (SCAS-P).** A Wilcoxon related samples signed rank test revealed small-medium and significant pre to post treatment effects (z=2.21, p=0.03; r=0.24) for children who benefited from the multisensory learning model. No treatment effects of statistical significance were recorded for children
within the ‘ABBT treatment without the learning model’ condition (z=0.12, p=0.65; r =<0.01). Results of primary measures of GAD symptoms are presented in Table 1 below.

Table 1: Treatment effects as measured by primary measures of GAD symptoms.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Treatment condition: ABBT with learning model</th>
<th>Treatment condition: ABBT without learning model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-test M (SD)</td>
<td>Post-test M (SD)</td>
</tr>
<tr>
<td>PSWQ-C</td>
<td>28.83 (4.79)</td>
<td>24.33 (5.16)</td>
</tr>
<tr>
<td>SCAS-P</td>
<td>36.83 (11.51)</td>
<td>31.33 (11.2)</td>
</tr>
<tr>
<td></td>
<td>18 (3)</td>
<td>12.5 (1.80)</td>
</tr>
<tr>
<td></td>
<td>24.12 (3.25)</td>
<td>24 (13.75)</td>
</tr>
</tbody>
</table>

4.3. Secondary measures of GAD symptoms

**Spence Children’s Anxiety Scale – Child (SCAS-C).** A Wilcoxon related samples signed rank test revealed marginally significant small-medium pre to post treatment effects (z=1.57, p=0.12; r=0.20) for children in the ‘ABBT with learning model’ treatment condition. For children who received ABBT treatment without the learning model, SCAS-C scores revealed a trend of an increase in anxiety symptoms from pre to post-test measures (z=1.60, p=0.11; r=−0.29).

**Strengths and Difficulties Questionnaire (SDQ).** A Wilcoxon related samples signed rank test did not reveal any effects of statistical significance between pre-test and post-test SDQ scores across either treatment condition; ‘ABBT with learning model’ condition (z=0.41, p=0.68; r=0.04) and ABBT without learning model’ condition (z=0.53, p=0.28; r=−0.13) respectively. No statistically significant treatment effects were found after analysis of SDQ’s ‘total’ scores as well as subscales including; ‘conduct problems,’ ‘emotional symptoms,’ ‘hyeractivity/inattention,’ ‘peer relationship problems,’ and ‘pro-social behaviour.’ Results of secondary measures of GAD symptoms are presented in Table 2 below.
Table 2: Treatment effects as measured by secondary measures of GAD symptoms.

<table>
<thead>
<tr>
<th>Treatment condition: ABBT with learning model</th>
<th>Pre-test M (SD)</th>
<th>Post-test M (SD)</th>
<th>Wilcoxon Signed Rank test</th>
<th>Effect size r</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCAS-C</td>
<td>56.33 (22.38)</td>
<td>47.83 (19.17)</td>
<td>Z = 1.57, p = 0.12</td>
<td>0.20</td>
</tr>
<tr>
<td>SDQ</td>
<td>14.5 (6.89)</td>
<td>14 (5.93)</td>
<td>Z = 0.41, p = 0.68</td>
<td>0.04</td>
</tr>
<tr>
<td>Treatment condition: ABBT without learning model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCAS-C</td>
<td>20.33 (8.08)</td>
<td>24.5 (5.41)</td>
<td>Z = 1.60, p = 0.11</td>
<td>-0.29</td>
</tr>
<tr>
<td>SDQ</td>
<td>12.33 (3.79)</td>
<td>14.33 (10.02)</td>
<td>Z = 0.53, p = 0.28</td>
<td>-0.13</td>
</tr>
</tbody>
</table>

4.4. Measures of experiential avoidance, fusion, acceptance, and mindfulness.

Avoidance and Fusion Questionnaire for Youth (AFQ-Y). A Wilcoxon related samples signed rank test did not reveal treatment effects of statistical significance between pre and post AFQ-Y test scores for children in the ‘ABBT with learning model’ treatment condition (z = 0.52, p = 0.6, r = -0.22). The same was true for children in the ‘ABBT without learning model’ treatment condition (z = 1.07, p = 0.28; r = 0.61).

Child Acceptance and Mindfulness Measure (CAMM). A Wilcoxon related samples signed rank test did not reveal treatment effects of statistical significance between pre and post CAMM test scores for children in the ‘ABBT with learning model’ treatment condition (z = 0.31, p = 0.75; r = 0.16). The same was true for children in the ‘ABBT without learning model’ treatment condition (z = 0.53, p = 0.59; r = 0.21). Results of measures of experiential avoidance, fusion, acceptance, and mindfulness are presented in Table 3 below.

Table 3: Treatment effects as measured by measures of experiential avoidance, fusion, acceptance, and mindfulness.

<table>
<thead>
<tr>
<th>Treatment condition: ABBT with learning model</th>
<th>Pre-test M (SD)</th>
<th>Post-test M (SD)</th>
<th>Wilcoxon Signed Rank test</th>
<th>Effect size r</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFQ-Y</td>
<td>34.00 (6.63)</td>
<td>37.33 (8.36)</td>
<td>Z = 0.52, p = 0.6</td>
<td>-0.22</td>
</tr>
<tr>
<td>CAMM</td>
<td>50.00 (3.12)</td>
<td>48.83 (3.86)</td>
<td>Z = 0.31, p = 0.75</td>
<td>0.16</td>
</tr>
<tr>
<td>Treatment condition: ABBT without learning model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.5. Impact of multisensory learning model on primary measures of GAD symptoms.

In order to determine if there was a benefit to treatment outcome from the inclusion of a multisensory learning model, differences in measures of anxiety and worry between pre-post treatment were compared across each treatment condition. For the ‘ABBT with learning model’ condition, PSWQ-C and SCAS-P scores declined on average after treatment by 4.5 and 5.5 units respectively. In comparison, without the inclusion of the learning model, PSWQ-C and SCAS-P scores declined 5.5 and 0.17 units respectively. The ability of treatment to reduce worry seems to have been similar with or without the learning model. The ability of treatment to reduce anxiety generally seems to have been slightly less effective without the learning model. However, with a sample size of n=10 and just three participants in the ABBT ‘without learning model’ condition, the ability to generalize these findings is limited. The mean difference between pre-treatment and post-treatment scores for PSWQ-C and SCAS-P measures are listed in Table 4 below.

Table 4. Differences between pre-treatment and post-treatment scores across treatment conditions.

<table>
<thead>
<tr>
<th>Scale</th>
<th>ABBT with learning model</th>
<th>ABBT without learning model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean difference between pre-treatment and post-treatment scores (SD)</td>
<td>Mean difference between pre-treatment and post-treatment scores (SD)</td>
</tr>
<tr>
<td>PSWQ-C</td>
<td>4.5 (3.83)</td>
<td>5.5 (2.18)</td>
</tr>
<tr>
<td>SCAS-P</td>
<td>5.5 (11.51)</td>
<td>0.17 (11.75)</td>
</tr>
</tbody>
</table>

4.6. Qualitative feedback from parents regarding the effectiveness of the program.

A program evaluation form was completed by parents at the cessation of treatment. The form contained the following open-ended questions; Did any component(s)
of the program stand out as being especially helpful for your child? How helpful was the Wilson model and how did it help your child manage his/her worry? Which strategies did you see your child use to manage his/her worries? Themes from parent responses are described below:

**Did any component(s) of the program stand out as being especially helpful for your child?** The components identified as being the most helpful was the mindful breathing component and the Wilson learning model. The Wilson Learning model was identified as being especially helpful in 4/7 of the returned forms. The daily mindfulness exercise was identified as being especially helpful in 4/10 returned forms from parents across both treatment groups.

**How helpful was the Wilson model and how did it help your child manage his/her worry?** Six out of seven parents reported that the Wilson learning model was helpful - one parent said that it was not helpful as her child was unable to verbalise her worries. Parents demonstrated understanding of the principles of acceptance, mindfulness, and thought engagement (metacognition) in their responses. Three parents demonstrated understanding of the principle of acceptance in their responses:

*Table 5: Qualitative feedback from parents on effectiveness of multisensory learning model.*

<table>
<thead>
<tr>
<th>Ways in which multisensory learning model was deemed helpful as suggested by parents</th>
<th>Parent verbatim response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing acceptance</td>
<td>“….talked about letting go of the handle”</td>
</tr>
<tr>
<td></td>
<td>“Learnt to allow thoughts to come and go and that they themselves didn’t have any actual power.”</td>
</tr>
<tr>
<td></td>
<td>“…put thoughts into perspective.”</td>
</tr>
<tr>
<td>Developing mindfulness</td>
<td>“Created awareness of how the mind processes worries”</td>
</tr>
</tbody>
</table>
Thought engagement - metacognition  
“Knowing she decides on what comes in and goes out of her mind was powerful”

Adding concreteness to an abstract concept  
“Took away the abstract”

Which strategies did you see your child use to manage his/her worries?

Parents were asked to nominate strategies that they observed their children use whilst participating in the program. Strategies used by participants as reported by parents are listed in the table below.

Table 6: Qualitative feedback from parents on strategies used by their children to manage worry.

<table>
<thead>
<tr>
<th>Strategy used to manage worry</th>
<th>Number of parents to see their child employ the strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindfulness of the breath exercise</td>
<td>5</td>
</tr>
<tr>
<td>Graduated exposure was mentioned</td>
<td>5</td>
</tr>
<tr>
<td>Mindfulness exercise involving drawing weather to reflect mood</td>
<td>1</td>
</tr>
<tr>
<td>Mindful thinking worksheet</td>
<td>1</td>
</tr>
</tbody>
</table>
CHAPTER 5 - DISCUSSION

The ability of treatment to reduce worry seems to have been similar with or without the learning model. The ability of treatment to reduce anxiety generally seems to have been slightly less effective without the learning model. However, with a sample size of n=11 and just four participants in the ABBT ‘without learning model’ condition, the ability to generalize these findings is limited.

5.1. Summary of key findings

The present study had three hypotheses. The first was that an Acceptance Based Behavioral Therapy (ABBT) treatment would be effective in reducing symptoms of anxiety and worry in children. Results confirmed this hypothesis. Measures of parent and child reported anxiety and worry were significantly reduced with small-moderate and
moderate-large effect sizes respectively. The second hypothesis was that an ABBT treatment for children including a multisensory learning model would improve treatment outcomes over ABBT treatment not including a multisensory learning model. Results showed similar treatment outcome associated with or without inclusion of a multisensory learning model in treatment. The third hypothesis was that reduction in children’s anxiety and worry would be associated with reduction in experiential avoidance and fusion, and an increase in acceptance and mindfulness. Results indicated, surprisingly, that treatment effects were not associated with decreases in experiential avoidance and fusion, nor increases in measures of acceptance and mindfulness. As a pilot study, in addition to investigating these hypotheses, a second purpose was to provide anecdotal information about the efficacy of a multisensory learning model.

Parents were asked to complete treatment program evaluation forms in order to gain anecdotal information about the efficacy of the multisensory learning model. Anecdotal information from parents indicated that the multisensory learning model was a valuable therapeutic tool. Parents indicated that the model was useful in the development of both mindfulness and acceptance of unpleasant thoughts and feelings for their children. Parent responses also indicated that the multisensory learning model was useful for helping their child to understand abstract principles introduced in treatment. Treatment effects from the present study can be compared to those reported in previous studies measuring the efficacy of anxiety treatment programs for children.

5.2. ‘Second wave’ CBT treatment outcomes for anxiety in children

Meta-analyses have measured the efficacy of cognitive behavioural therapy (CBT) for anxiety-disordered children. In-Albon (2007) used the findings of 24 published
random-controlled trials (RCT’s) to gain a measure of the efficacy of CBT in treating children’s anxiety. In-Albon’s (2007) analysis indicated that the efficacy of CBT treatment was within the ‘large’ effect size range. Application of a 95% confidence interval indicated that treatment efficacy was best represented between medium-large and very large effect sizes (In-Albon, 2007). A more recent meta-analysis replicated In-Albon’s (2007) findings.

Reynolds (2012) also found measured CBT treatment to be effective in treating children’s anxiety disorders. Reynolds (2012) performed a meta-analysis across 34 RCTs to similarly produce a ‘large’ treatment effect. In replication of In-Albon (2007), application of a 95% confidence interval produced lower and upper effect sizes within the medium-large and very large ranges respectively (Reynolds, 2012). The results of the present study will be compared to In Albon’s (2007) and Reynold’s (2012) findings.

Regarding treatment involving the multisensory learning model, statistically significant reduction of worry was measured to be within the ‘moderate-large’ range. Treatment effects of broader self-reported levels of anxiety were also found to be statistically significant and within the ‘small-moderate’ range. These treatment effects are on the lower end of what would be expected of a typical CBT treatment for children. For those children in the present study who received an ABBT treatment without inclusion of the multisensory learning model, large treatment effects of marginal significance were recorded regarding reduction in worry. Significant results were not recorded regarding reduction in broader self-reported levels of anxiety. This lack of statistical significance can partly be attributed to the very small number of participants (n=4) within the ABBT without multisensory learning model group. These results will
also be reviewed in light of the state of the literature regarding the efficacy of ‘third wave’
treatment for childhood anxiety disorders.

5.3. ‘Third wave’ anxiety treatment outcomes.

‘Third wave’ behavioural therapy treatments share an emphasis on mindfulness
and acceptance and include treatments such as Acceptance and Commitment Therapy
(ACT; Hayes, 2004), Mindfulness Based Cognitive Therapy (MCBT; Teasdale, Segal, &
Williams, 1995), and Acceptance Based Behavioural Therapy (ABBT; Roemer et al,
2005). Whilst third wave treatments have been found to be effective in treating anxiety in
adults, there is limited information about their efficacy in children (Swain, 2013).

Semple, Lee, Rosa, and Miller (2010) found MCBT to be effective in treating a
group of 25 9-13 year old anxious children. It was reported that the MCBT treatment had
a moderate to large effect in reducing symptoms of anxiety. This is broadly consistent
with what might be typically expected from a comparable CBT-based treatment. In-
Albon’s (2007) and Reynold’s (2012) meta-analyses of CBT-based treatment reported
effect size magnitude to fall with 95% confidence between the moderate-large and very
large ranges. The results of Semple and colleague’s (2010) MCBT study will also be
considered in light of the results of the present study.

Children receiving MCBT in Semple and colleague’s (2010) study reported
receiving slightly stronger treatment effects than did the children receiving ABBT in the
present study. The present study’s small to medium effect size of broad symptoms of
anxiety is smaller than the medium to large effect size reported by Semple and colleagues
(2010). Reduction of participants’ worry within the present study was of a similar
magnitude to the reduction of symptoms of anxiety reported by Semple and colleagues
TREATMENT OF PATHOLOGICAL WORRY IN CHILDREN WITH ‘THIRD WAVE’ BEHAVIOURAL THERAPY AND A MULTISENSORY LEARNING MODEL: A PILOT STUDY

(2010) ‘third wave’ MCBT treatment. The present study had a particular focus on treating pathological worry. The present study’s results will also be reviewed in light of the state of the literature regarding the use of a ‘third wave’ behavioural therapy approach to treat pathological worry.

5.4. ‘Third wave’ behaviour therapy approaches to treat pathological worry.

Semple et al.’s (2010) trial of MCBT in treating anxiety in children did not report specific treatment outcome data regarding pathological worry. To the author’s knowledge there are also no other published studies that specifically report change in pathological worry as a from a ‘third wave’ treatment. Consequently, the best indication of the efficacy of third wave treatments to treat children’s worry comes from studies that involved adult participants. Three studies using third wave therapeutic approaches have reported specific pathological worry outcome data. Using adult participants, Wetherell (2011) reported large treatment effect sizes from an Acceptance and Commitment Therapy (ACT) treatment program with older adults. Roemer et al (2008) reported large effect sizes from the administration of an Acceptance Based Behavioural Therapy treatment. Similarly, Roemer and Orsillo (2007) also reported large treatment effects from administration of an Acceptance Based Behavioural Therapy treatment using adult participants. These outcomes will be considered in light of the results of the present study.

In comparison, the present study reported comparable treatment effects of reduction in pathological worry. With child participants, the present study produced medium to large’ and ‘large’ effect sizes in its ABBT ‘with’ multisensory learning model treatment condition. The present study’s results in regard to reduction, specifically of
pathological worry will also be reviewed in regards to the ‘second wave’ CBT literature with adult and then child participants.

5.5. ‘Second wave’ CBT treatment for pathological worry with adult participants

Analysing 38 studies using adult participants, a recently published meta-analysis reported a ‘large’ CBT treatment effect on symptoms of Generalized Anxiety Disorder (GAD) (Cuijpers et al., 2014). Cuijpers and colleagues (2014) reported an overall measure of treatment effect with a 95% confidence interval ranging from the ‘medium-large’ to ‘large’ ranges. The medium-large and large effect sizes regarding reductions in pathological worry reported in the present study fall within this 95% confidence interval.

‘Second Wave’ CBT treatment for pathological worry in children will also be reviewed.

5.6. ‘Second wave’ CBT treatment for pathological worry in children

Whilst data from In-Albon’s (2007) and Reynold’s (2012) meta-analyses suggested that CBT was effective in the treatment of children’s anxiety disorders generally, they did not provide an indication of the efficacy of CBT in reducing the specific behavior of worry. There is to the author’s knowledge just one study which has measured the efficacy of a CBT-based treatment to reduce pathological worry in children. Payne (2011) found that a CBT-based treatment was effective in reducing pathological worry in children across a group of 16 7-17 year old children. Payne (2011) measured worry using the Penn State Worry Questionnaire and recorded a very large pre-post treatment effect size. Payne’s (2011) results can be compared to the present study.

Payne’s (2011) ‘very large’ treatment effect was of a greater magnitude than that recorded in the present study. Payne’s (2011) treatment was based on Dugas’ (1994) Intolerance of Uncertainty model of GAD and had an emphasis on reducing exposure to
uncertainty, cognitive restructuring, and imagined exposure (Payne, 2011). The present study’s ABBT treatment was associated with reductions in pathological worry of medium-large and large effect size magnitudes respectively across the two treatment conditions. The findings of the present study in regards to associated measures of experiential avoidance, fusion, and mindfulness will also be discussed.

5.7. Measurement of experiential avoidance, fusion, and mindfulness in children

It was a hypothesis of the present study that as children’s anxiety decreased, experiential avoidance and fusion would decrease, and mindfulness would increase. Contrary to this hypothesis, the results of the present study indicated no significant correlation between anxiety or worry and measures of experiential avoidance, fusion, or mindfulness. A possible explanation for this may have been that the questionnaires used to measure experiential avoidance, fusion, and mindfulness may have contained test items too difficult for children to understand and answer correctly. This consequently may have affected the questionnaires’ validity.

Fusion and experiential avoidance was measured by the Avoidance and Fusion Questionnaire for Youth (AFQ-Y) and mindfulness was measured by the Child Acceptance and Mindfulness Measure (CAMM). The comprehensibility of items had previously been investigated for both the AFQ-Y and the CAMM. The Comprehensibility of test items for the AFQ was measured using a sample of 181 6th-8th-grade students with a mean age of 12.7 years (Greco, Lambert, and Baer, 2008). The comprehensibility of test items for the CAMM was measured using a sample of 10-17 year olds with a mean age of 12.1 years (Greco et. al., 2011). In both studies, comprehensibility issues arose with four items which were subsequently modified or replaced (Greco, Lambert, and
Baer, 2008; Greco et al., 2011). In both investigations of test item comprehensibility, the majority of children were older than those participating in the present study. This is particularly true regarding the CAMM test items; the sample used to investigate the comprehensibility of the CAMM featured children between 10 and 17 years of age. In contrast, the present study’s participant sample featured younger children between 7 and 11 years of age. The age gap between participants of the present study and the participants on whom the CAMM and AFQ-Y was validated is significant given that the ability to understand abstract concepts such as mindfulness are skills that develop as children age (Flavell, 2000).

For children, the ability to comprehend abstract concepts is understood to develop over time (Flavell, 2000; Piaget, 1987). The specific ability to have insight into thought activity has also been shown to emerge in children at approximately 8 to 9 years of age (Flavell et al., 2000). Therefore, it would be expected that psychometric data regarding the comprehensibility of test items regarding experiential avoidance, fusion, and mindfulness would be sensitive to age effects. Validity issues with the AFQ-Y and/or CAMM with the present study’s participant group is one possible explanation for the lack of correlation between anxiety or levels of worry and measures of experiential avoidance, fusion, or mindfulness in the present study. To the author’s knowledge there have been no studies measuring the validity of the AFQ and CAMM with 7-11 year old children. The theoretical implications of the present study’s results on models of pathological worry will also be discussed.

5.8. Theoretical implications for the understanding of pathological worry
Within the literature are several theoretical accounts of pathological worry. A hypothesis of the present study was that reductions in participant worry and anxiety would be mediated by increases in mindfulness and decreases in experiential avoidance and fusion. This hypothesis was based on Roemer and Orsillo’s (2002) Acceptance Based Model of worry (ABM). The ABM suggests that there are three factors responsible for maintaining pathological worry; a problematic relationship with internal experiences, experiential avoidance, and behavioural restriction (Roemer & Orsillo, 2002; Roemer, Salters, Raffa, & Orsillo, 2005). A problematic relationship with internal experiences involves negatively reacting to and becoming ‘fused’ with thoughts. The Experiential avoidance component of the ABM describes the active avoidance of a private experience (bodily sensations, thoughts, emotions etc.) which a person perceives to be threatening or is unwilling to remain in contact with (Hayes et al., 1996; Roemer & Orsillo, 2002). The behavioural restriction component of the ABM refers to the suggestion that individuals with pathological worry tend not to pursue actions or engage in behaviours that are important to them (Roemer & Orsillo, 2002, 2005). The results of the present study were able to offer insight into the validity of two of the theoretical claims of the ABM; that pathological worry is maintained by a problematic relationship with internal experiences. And secondly, that pathological worry is maintained by individuals engaging in experiential avoidance.

Results of the present study did not provide empirical support for the ABM. The ABM suggests that reduction in children’s worry would be associated with increases in mindfulness. Inconsistent with claims by the ABM, decreases in worry were not associated with increases in mindfulness (CAMM) scores. The ABM also suggests that
decreases in children’s worry would be associated with a decrease in experiential 
avoidance and the degree to which children ‘fuse’ with cognitions. Inconsistent with 
claims by the ABM, results of the present study indicated no association between worry 
and experiential avoidance and fusion. As previously discussed, it is possible that this 
lack of association was a result of validity issues regarding the use of the AFQ and 
CAMM with the young participants within this particular study. Until the validity of the 
AFQ and CAMM is established with younger (7-11) year old children, caution needs to 
be taken before interpreting the apparent lack of empirical support for the ABM 
suggested by this study’s results. Implication of the present study’s results will also be 
discussed in reference to other models of pathological worry.

Other models of pathological worry include Borkovec’s (1994) Avoidance Model 
of Worry (AMW), Dugas et al’s (1995) Intolerance of Uncertainty model (IUM), and 
Roemer and Orsillo’s (2002) Acceptance Based Model of worry (ABM), Hirsch & 
each of the above models was evaluated, it was Dugas et al.’s (1995) Intolerance of 
Uncertainty Model of worry that seemed to have the strongest level of empirical support.
The IUM expanded upon Borkovec’s (1994) seminal Avoidance Model of Worry (AMW) 
which itself had strong empirical support. The IUM’s introduction of the notion of 
Intolerance of Uncertainty (IU) was found to be able to reliably discriminate individuals 
with and without GAD and add value to the already well supported AMW. The ABM 
was also found to be well supported but fell just short of the IUM’s level of empirical 
support because of some inconsistency of results in the literature. Roemer et al. (2005)
were unable to find a link between experiential avoidance and GAD symptom severity - potentially problematic as experiential avoidance was a central component of the ABM. Whilst the results of the present study did not explicitly support the ABM, possible validity issues with the AFQ-Y and CAMM suggests that it would be problematic to suggest that a lack of support for the ABM infers a greater level support for alternative models of worry. Results will also be discussed regarding the value of the multisensory learning model.

5.9. Efficacy of the multisensory stimulus model

There were no significant differences in scores of worry or anxiety between children in the ‘ABBT with learning model’ and children in the ‘ABBT without learning model’ treatment groups. However, given the small sample size used (n=10), there was only sufficient statistical power to detect large differences between the ABBT with learning model and ABBT without learning model treatments (Cohen, 1988). A large effect size would not be expected given that two active treatment groups were being compared. Any treatment advantage from the ABBT with learning model condition would likely be within the small to moderate effect size range (Cohen, 1988). For example, the effect sizes of RCTs fell from being within the medium to large range to the small to medium range when meta-analyses only included RCT’s with active control groups (Reynolds & Reynolds, 2014). A more useful measure of the clinical benefit of the multisensory learning model was in qualitative data collected from parents in the study’s ‘treatment evaluation’ form.

Qualitative data collected from parents indicated that the multisensory learning model was a valuable clinical tool. Parents indicated that the model was helpful in
developing acceptance, mindfulness, and understanding of metacognitive principles (thinking about thinking) in their children.

5.10. Limitations

The present study contained limitations regarding design, content of the anxiety treatment, and limitations regarding delivery factors. One aspect in which the design of the study could have been improved would have been to introduce a means to assess the performance of the therapist during treatment sessions. Benefits of measuring the therapist’s performance would have allowed any systematic differences in therapist performance across treatment groups to be considered when interpreting comparison of scores, improved the performance of the therapist by having the capacity to offer critical feedback, and being able to factor in the therapist’s skill level when interpreting results.

Another aspect in which the design of the study could have been improved would have been to have included a larger number of participants. A greater number of participants would have enabled a more powerful statistical analysis to perform a comparison of treatment outcomes between the ‘ABBT with learning model’ and ‘ABBT without learning model’ treatment conditions.

A third aspect of the study’s design that could have been improved would have been the addition of a third wait-list control condition. Whilst having ABBT ‘with learning model’ and ABBT ‘without learning model’ treatments did provide some control for a possible ‘learning model’ effect, the design left evaluation of the ABBT treatment itself open to influence from potentially confounding extraneous variables. A wait-list control group of participants completing questionnaires without initially receiving an ABBT intervention would have provided a more accurate and scientifically rigorous
evaluation of the efficacy of the ABBT treatment. It is a limitation which could potentially be remedied in a future larger scale research project.

A limitation regarding the content of the anxiety treatment was a lack of time devoted to completing mindfulness activities during treatment sessions. Parents gave feedback that they would have liked to have more practice of the mindfulness skills during the treatment sessions. There were formal mindfulness sessions in Weeks 1 and 2 across each treatment condition with mindfulness activities set as practice tasks during the week in following sessions. There was a single third mindfulness activity in Week 7. One parent made the comment that they thought that opening or closing each treatment session with a mindfulness activity would have been beneficial for their child. Benefits of more frequent mindfulness activities may have included increased levels of mindfulness for participants as well as increased completion rates of mindfulness homework activities during the week. Delivery factors of treatment format, length of treatment, and experience of the facilitator may each have been limiting factors.

The literature suggests that there is benefit of administering anxiety treatment individually over administration in groups. There is also evidence to suggest that the optimum length of an anxiety treatment program would be 13-16 hours with at least 11 sessions. The present treatment was administered in a group format for a duration of 7 hours over 7 sessions. This format was chosen for pragmatic reasons - a seven week treatment with extra week for scoring questionnaires allowed treatment to fit inside a single NSW school term. It was thought that running the program into a school holiday period may have resulted in increased absenteeism as families travelled during the school term break. The decision to administer the program in a group format was made to ensure
that there would be sufficient numbers of participants to make statistical comparisons between pre-test and post-test outcome measures. There is anecdotal evidence that suggests that the personal experience of mindfulness teachers/facilitators may have an impact on treatment outcomes of anxiety treatment program incorporating mindfulness.

Jon Kabat-Zinn (2003) – author of several seminal studies on the benefits of Mindfulness Based Stress Reduction (MSBR) emphasized the need for teachers or facilitators of mindfulness meditation to be personally practicing mindfulness meditation themselves; ‘In our experience, unless the instructor’s relationship to mindfulness is grounded in extensive personal practice, the teaching and guidance one might bring to the clinical context will have little in the way of appropriate energy, authenticity, or ultimate relevance, and that deficit will soon be felt by program participants’ (Kabat-Zinn, 2003, p. 150). The facilitator of the present study’s treatment program had a limited history of personal experience of mindfulness. It is possible that the mindfulness components of the treatment program may have had greater effect if administered by a facilitator with a strong history of experience with personal mindfulness practice. Next, practical challenges faced in treatment delivery – relevant in an adaptation from pilot study to future larger scale research will be discussed.

5.11. Challenges in treatment delivery

Benefits of a pilot study include learning about the feasibility of a project and learning more about potential adverse events. Additionally, pilot studies have also been reported to be useful for revealing flaws in study design (Hulley, 2007). The present study revealed several themes likely to have implication in the planning of an up-scaled research project. These themes included; awareness of the degree to which therapists
attempt to convey information from speaking, time management during program sessions, selection of participants, and parent involvement. Each of these themes will be discussed in turn.

From the experience of administering the treatment programs, it became clear during the first 3 sessions that there was a limit to the quantity of information able to be acquired solely from listening to a therapist speak. For example, in the second week’s treatment session, children were introduced to the analogy of different types of weather being symbolic of different mood states. It was noticed that participating children did not seem to fully grasp the concept until they had begun activities involving drawing and interaction with visual stimuli. A larger scale adaptation of this pilot study would have a greater ratio of experiential activities to didactic teaching and limit the amount of information to be delivered by therapists solely speaking. Another theme revealed by the administration of the present pilot study was the importance of time management during treatment sessions.

Successful time management during treatment sessions proved to be a challenge for the therapist. Effective time management involved two skills; being able to predict how much time an activity would take, and being flexible enough to adapt content during sessions to finish on time. In the translation to a larger scale research project, emphasis will be placed on careful planning of treatment sessions with activities designed in such a manner that there is flexibility in the amount of time required to complete them. Another theme revealed in the administration of the present pilot study was the importance of careful participant selection.
There was feedback from some participating parents that their children would have preferred to have been completing a program with children closer to their own chronological age. Participants aged between 7 and 11 years of age were recruited into the study and randomly assigned to one of two treatment conditions. A gap was apparent regarding the cognitive and social development of the younger participants in comparison to the older participants. Translation of the current pilot study into a larger scale research project would likely involve efforts to limit the variation in age amongst participants. A possible benefit of this may be an increased sense of collegiality amongst participants.

The final theme revealed in the administration of the present pilot study was parent involvement within the program.

Parents played a significant role in treatment within the present pilot study. Parents were in the same room as the participating children during treatment and assisted their children with more challenging activities. Together, parents and children completed worksheets involving the identification of cognitions, design gradual exposure regimes, and were asked to help to reinforce psychological concepts such as acceptance and defusion in-between sessions. Two parents indicated on program evaluation forms that they would have liked to have received additional information about the processes and rationale behind the various components of the program. Research suggests that greater parent involvement is not associated with greater anxiety treatment outcome (Reynolds, et al., 2012). However, it is reasonable to hypothesize that increased education about the processes and rationale behind various treatment components may benefit participants. In the translation of pilot study to a larger scale research project, greater consideration would likely be given to educating parents about the processes and rationale behind the
various components of a treatment program. The broader clinical implications of the present study’s results will also be discussed.

5.12. Broader Clinical Implications

The results of the present study provide support to the notion that ‘third wave’ behaviour therapies may be useful in treating persistent and chronic worry. This is particularly significant as Generalized Anxiety Disorder, the anxiety disorder characterized by chronic and persistent worry, has been described as difficult to treat with many failing to maintain end-state functioning after treatment (Roemer & Orsillo, 2002; Hudson, 2009). Whilst CBT or ‘second wave’ behaviour therapy remains the ‘gold standard’ for the treatment of children’s anxiety, results of the present study revealed reductions in both worry and anxiety for participants participating in a ‘third wave’ ABBT treatment. These results are particularly noteworthy considering some of the limitations of the present study. The potential for ‘third wave’ treatment approaches is even more apparent when it is considered that the present study’s results were attained over a relatively brief (7 week) intervention in a group format with a relatively inexperienced facilitator. Another clinical implication of the results of the present study refers to the potential therapeutic value of the multisensory learning model.

The results of the present study also suggested that the multisensory learning model may be a valuable clinical tool in helping children to understand metacognitive principles of anxiety treatment. Incorporation of visuals and concrete stimuli into CBT has been discussed as a means to improve treatment outcomes for children in the past (Moree & Davis, 2010; Willner, 2006). Participants in the present study who participated in ABBT treatment using the multisensory learning model produced significant pretest to
CHAPTER 6 - CONCLUSION

The purpose of this research was to explore the efficacy of ‘third wave’ behaviour therapy with children and to gain a sense of the therapeutic potential of a multisensory learning model. A pilot study was administered that showed that a ‘third wave’ Acceptance Based Behavioural Therapy (ABBT) program was associated with reductions in anxiety and worry in participating children. Measures of parent and child reported anxiety and worry were significantly reduced with small-moderate and moderate-large effect sizes respectively. This pilot study also provided valuable information regarding the therapeutic potential of the therapeutic learning model. Parent treatment evaluation forms indicated that the model was effective in helping children understand concepts of defusion, acceptance, and mindfulness. In the context of the anxiety treatment literature for children as a whole, perhaps the greatest value of this pilot study may be its foundational role in future larger scale trials.

A future larger scale project would likely help to answer the questions at the heart of this research project that is; how much added benefit does a third wave approach with
A significant question that has arisen from the present study was the validity of the instruments used to measure experiential avoidance, fusion, acceptance and mindfulness in young children. This question arose after correlation was not found between measures of anxiety or worry - with scores on the Avoidance and Fusion for Youth questionnaire (AFQ-Y) or the Child Acceptance and Mindfulness Measure (CAMM). Both scales have demonstrated sound validity with older children than those used in the present study (mean age 12-13 years). However, there was to the author’s knowledge, no psychometric data on the use of the AFQ-Y or CAMM with younger children of the age of many of this study’s participants. Further exploration of the validity of the CAMM and AFQ-Y with 7-10 year old children is be a direction for future research and may make a sound contribution to the clinical psychological literature.
Another area of future research regards the relative efficacy of various components comprising ‘third wave’ treatment programs for children’s anxiety. The present pilot study built on the work of Semple et al. (2010) who produced reduction in anxiety from a third wave Mindfulness Based Cognitive Behavioural Therapy (MCBT) treatment. This pilot study produced further evidence that a third wave approach may be an effective anxiety treatment for children. Further research is needed to disseminate the relative efficacy of various treatment components of third wave anxiety treatments with children. Understanding the relative efficacy of mindfulness exercises in comparison to acceptance exercises or defusion activities in reducing anxiety would be helpful for the design of more effective treatment programs.

The final suggested direction for future research involves the multisensory learning model. In this pilot study study parents reported that the model helped their children to understand concepts of acceptance, mindfulness, and defusion, helped their children understand the notion of engaging in thoughts (metacognition), and made an abstract concept more concrete. Future studies with sufficient statistical power to detect differences between active treatments would be useful in further investigating the benefit of the multisensory learning model. It is also a possibility that the learning model may be particularly effective for children with intellectual disabilities, autistic spectrum disorders, or language disorders.

Children with intellectual disabilities, autistic spectrum disorders, or language disorders would likely struggle more with abstract concepts in anxiety treatment than children from the normal population. This is because such children typically have a reduced ability to process language. If the multisensory learning model is effective in
helping children to understand abstract concepts of mindfulness, acceptance, and defusion, it may be especially helpful for children whose language skills present an additional barrier to treatment.

REFERENCES


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TREATMENT OF PATHOLOGICAL WORRY IN CHILDREN WITH ‘THIRD WAVE’ BEHAVIOURAL THERAPY AND A MULTISENSORY LEARNING MODEL: A PILOT STUDY


TREATMENT OF PATHOLOGICAL WORRY IN CHILDREN WITH ‘THIRD WAVE’ BEHAVIOURAL THERAPY AND A MULTISENSORY LEARNING MODEL: A PILOT STUDY


APPENDIX

Figure A1. Flyer used to recruit participants.

Do you have a child who worries a lot?

Does your child experience ‘tears’ before a new event; seem overly sensitive or have a ‘worry’ tummy?

There is evidence from research to say that children who worry excessively can learn skills to help them worry less.

I am a Masters Research student at the University of Western Sydney and am conducting research to determine if, and how, a skills based program might help children better manage their worries. This program is targeted at 7-10 year olds.

This program will run for eight weeks for a one hour session from 4-5pm each week. The program will run on a Tuesday or Wednesday evening at the Gordon Lifeline Community Centre and is part of a research project. This program is free.

If you would like your child to be part of this program please contact the researcher Richard Meagher on 0425 342 213 or email at 16822522@student.uws.edu.au.

This particular program is not suitable for children with an autistic spectrum disorder or who have a diagnosed language or global delay.
Figure A.2. Program evaluation form for ABBT ‘with’ multisensory learning model group.

**Program evaluation form**

**How effectively did the facilitator build rapport with the children? (Please circle)**

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<th>3</th>
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<tbody>
<tr>
<td></td>
<td>Poorly</td>
<td>Very effectively</td>
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**Learning activities were set at an appropriate level for your child? (Please circle)**

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<tr>
<td>Too easy</td>
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<td>appropriate</td>
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</table>

**Expectations for the completion of homework tasks was set at a manageable level. (Please circle)**

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<tbody>
<tr>
<td>Not enough H/W</td>
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<td>appropriate amount</td>
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<td>Too much H/W</td>
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</table>

**Did any component(s) of the program stand out as being especially helpful for your child?**

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**How helpful was the ‘Wilson’ learning model. How did it help your child to manage his/her worry?**

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**Which strategies did you see your child use to manage his/her anxiety/worry?**

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**How could the program be improved?**

__________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________
Program evaluation form

How effectively did the facilitator build rapport with the children? (Please circle)

0          1          2          3          4          5          6

Poorly  Very effectively

Learning activities were set at an appropriate level for your child? (Please circle)

0          1          2          3          4          5          6

Too easy  appropriate  Too challenging

Expectations for the completion of homework tasks was set at a manageable level. (Please circle)

0          1          2          3          4          5          6

Not enough H/W  appropriate amount  Too much H/W

Did any component(s) of the program stand out as being especially helpful for your child?

__________________________________________________________________________________________

__________________________________________________________________________________________

__________________________________________________________________________________________

__________________________________________________________________________________________

Which strategies did you see your child use to manage his/her anxiety/worry?

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How could the program be improved?

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Figure A.3. Program evaluation form for ABBT ‘without’ multisensory learning model group.