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# Can the catastrophizing interview technique be used to develop understanding of childhood worry?

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## Abstract

**Background:** The current research-base into childhood worry is extremely limited, in part owing to the lack of appropriately validated measures of worry suitable for use with children. Although some adult measures of worry have successfully been adapted for use with children, as of yet no measure suitable for use within an experimental paradigm has been developed, meaning that the majority of the existing research is based on correlational designs and therefore does not allow exploration of causative relationships between childhood worry and other factors.

**Aim:** This thesis aimed to explore the use of the catastrophizing interview technique with children, with the goal of validating this technique as an experimental measure of childhood worry.

**Method:** A mixed methodology was employed, using both single group correlation and between group comparisons. Additionally, a qualitative aspect to the design allowed greater exploration of the interview responses given by participants. The data from 88 participants aged 9 – 11 was used for the analysis. Participants completed a number of interviewer-assisted measures of worry, verbal reasoning, verbal fluency and tendency to respond in a socially desirable manner, before completing two catastrophizing tasks.

**Results:** Limited evidence was found for a relationship between the catastrophizing interview responses and tendency to worry. However, when confounding variables such as verbal ability were controlled, a relationship between the number of steps

generated using the interview and tendency to worry was found. Additionally, high worriers were more likely to respond in an extreme or circular manner, than low worriers.

Discussion: Although this study found limited support for using the catastrophizing interview technique with children, there were a number of methodological issues with the study design that may have affected results. Given the need for a greater understanding of the processes of childhood worry, further exploration of using the catastrophizing interview technique is warranted.



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## 1.1 Overview

Worry is a cognitive activity whereby individuals become preoccupied with possible negative future events. Childhood worry has, historically, been a neglected area of psychological research (Cartwright-Hatton, 2006). One reason provided for the scarcity of research into this area is the lack of appropriate experimental measures available to explore childhood worry. Although some measures have successfully been adapted for use with children and adolescents, existing validated measures lack the sensitivity to be used to examine the outcome of experimental manipulations. Worry is increasingly identified as a key psychological component in a range of psychological disorders for both adults and children (Purdon & Harrington, 2006), and therefore a better understanding of the processes involved in pathological worrying could improve treatment outcomes for all age-groups. One of the most commonly used experimental measures of worry within the adult population is the catastrophizing interview technique (Vasey & Borkovec, 1992), which has allowed researchers to study in detail the processes involved in a worry bout, and to measure the effects of various manipulations on participants' levels of worry. The validation of the measure for use with a child population could potentially lead to similar developments in the field of childhood worry. This study, therefore, aims to investigate the use of the catastrophizing interview technique as a measure of worry in children.

This chapter provides a review of the relevant literature relating to worry in general and childhood worry in particular, followed by an introduction to this study and its rationale. Section 1.2 provides an outline of the topic of worry. After providing a current definition of worry and an exploration of how worry differs from

fear or anxiety, its prevalence (in both adult and child populations), its hypothesised role and function, and relationship to psychological disorders will be addressed.

Section 1.3 explores the current research evidence-base for worry in child populations. Following a brief contextual history of research into worry, this section addresses the research base into childhood worry, evaluating the current range of measures validated for use with this population, and identifying the impact the lack of validated measures has had on the further exploration of childhood worry. In Section 1.4 the catastrophizing interview technique is introduced, and its current role in developing an understanding of adult and childhood worry is summarized. Section 1.5 provides a critical summary of the current evidence and existing research.

Section 1.6 discusses theories of child development and the developmental concerns relating to applying adult models and measures to childhood psychopathology. The specific developmental factors that require consideration when using the catastrophizing interview technique with children are explored. Finally, section 1.7 summarises the aims and rationale for the present study, including its clinical implications, research questions and hypotheses.

## **1.2 Worry**

### **1.2.1 Defining worry.**

Worry relates to the anticipation of future, negative events. It has been defined as ‘primarily an anticipatory cognitive process involving repetitive thoughts related to possible threatening outcomes and their potential consequences’ (Vasey, Crnic & Carter, 1994, p.530).

Worry can be conceptualised as existing on a spectrum, from commonplace, potentially productive worrying (Davey, Hampton, Farrell & Davidson, 1992), to

problematic worry, characterised by repetitive, catastrophic speculation. In its pathological form, it can be described as an unwanted, uncomfortable, aversive cognitive activity associated with negative thoughts and some sense of emotional discomfort (Davey & Wells, 2006).

One particular form of worrying that appears to relate to psychological distress is catastrophic worrying, whereby individuals use a ‘what if’ questioning style to perseverate on their worry topics (Davey & Levy, 1998; Kendall & Ingram, 1987). This tends to lead worriers to reach ever more catastrophic outcomes of anticipated future events.

### **1.2.2 Differentiating worry, fear and anxiety.**

The terms worry, fear and anxiety have often been used interchangeably, and in fact the similarities between them was one factor accounting for the scarcity of research into worry as an independent construct. O’Neill (1985) argued that worry was merely a cognitive manifestation of anxiety, and that there was no functional difference between the two concepts. Other researchers, however, have emphasised the unique sources of variance in worry, and have suggested that it should be understood as an independent construct (Gana, Martin, & Canouet, 2001).

In their paper exploring children’s understanding of the difference between these concepts, Muris, Mercklebach, Gadet and Moulaert (2000) identify fear as a phenomenon that occurs when an individual is faced with an actual (perceived) threat or danger, whereas worry occurs in the absence of any actual or perceived current threat, and is concerned with anticipating future threatening scenarios. For example, an individual with a dog phobia is likely to experience fear when faced with the presence of a dog, whereas they may spend considerable time worrying

about possible future scenarios in which a dog may be present, and the possible negative outcomes of such events.

Although there is clearly some overlap between the features of worry and anxiety (Stöber, 1995), worry has been demonstrated to be a construct in its own right. Davey et al. (1992) conducted a series of studies that identified some of the characteristics in which worry and anxiety differed. By alternatively partialling out trait anxiety and worry, they concluded that worry was associated to a greater extent with problem-focused, information-seeking and monitoring coping strategies, whereas anxiety was associated more highly with factors associated with poor outcomes, such as poor levels of perceived control and greater personal responsibility for negative outcomes. Therefore, they concluded that worry and anxiety could occur independently of each other, with varying implications for psychological wellbeing.

Additionally, worry has been identified to be predominantly a verbal thought activity, whereas anxious cognitive processes more commonly contain both verbal and imaginal content (Borkovec, Ray, & Stöber, 1998). It appears that it is the negative imagery associated with anxiety that leads to somatic symptoms such as increased heart rate and adrenaline production, which are not as prevalent in the experience of worry (Borkovec & Hu, 1990).

### **1.2.3 Role and function of worry.**

The commonality of worry as an experience leads to questions regarding the purpose of worry, and the role that it fulfils in everyday life. Often, worry is perceived as purposeful, fulfilling a problem-solving function. Borkovec (1985) conceptualised worry as a process “initiated by a fear stimulus (environmental and/or

imaginal) which elicits mental problem-solving activity designed to prevent the occurrence of traumatic future events and/or to devise coping strategies for such events”. Indeed, Davey et al. (1992) provided evidence of a relationship between problem-solving activity and worry, and identified that worry can occur in the absence of anxiety (i.e. worry that was perceived as a positive, or constructive, form of problem-solving). Therefore, worry has been argued to have the potential of being a productive, useful, process. As with anxiety, a certain amount of worry allows individuals to anticipate negative events (such as failing an exam) and to devise strategies in order to avoid such outcomes (such as revising). Worry can therefore be a positive, motivating force.

However, it is clear that in some individuals the extent of their level of worry means that it becomes an unhelpful, repressive force (Borkovec, 1998). Worry in its extreme form is a distinguishing feature of Generalised Anxiety Disorder (GAD), which can affect all aspects of an individual’s life and wellbeing. Although often perceived as a helpful, problem-solving process, excessive worry can be demonstrated to inhibit practical problem-solving ability (Metzger, Miller, Cohen, Sofka & Borkovec, 1990).

Additionally, researchers have hypothesised that worry can serve the function of allowing individuals to avoid more aversive physical and emotional states. Stöber (1998) demonstrated that worry, as an abstract thought process, can inhibit emotional responses and imagery. Borkovec and Hu (1990) also demonstrated that this inhibitory effect reduces somatic anxiety responses such as a cardiovascular response when faced with the worrying situation. However, by reducing these reactions, individuals fail to habituate to anxiety-provoking situations, therefore maintaining the original worry.

#### **1.2.4 Prevalence of worry in the adult population.**

Worry is a common phenomenon, and it has been found that over a third of the general population worry at least once daily, with the majority of individuals reporting worrying at least on a monthly basis (Tallis, Davey, & Capuzzo, 1994). For the majority, this is not detrimental to functioning or the enjoyment of everyday life. Over half of the sample used in Tallis' study (128 working age adults) reported that the duration of these worry episodes was 10 minutes or less.

However, more extreme experiences of worry can have a significant, detrimental effect on everyday life. Excessive worry is a key defining feature of Generalised Anxiety Disorder (GAD; DSM-IV-TR), which has been commonly found to have a lifetime prevalence of 5% within the general population (Wittchen & Hoyer, 2001), with onset most commonly occurring in the late teens to late twenties (Barlow, Blanchard, Vermilyea, Vermilyea & DiNardo, 1986). Pathological worry has also been associated with other disorders, meaning that the actual number of individuals experiencing pathological levels of worry is likely to be significantly higher. Indeed, Ruscio (2002) found that only 20% of individuals who reported extreme levels of worry (to the extent that would be associated with GAD) actually fulfilled the overall GAD criteria. Therefore, the proportion of the population for which pathological worry may be affecting their quality of life could be significantly higher than the 5% that meet the diagnostic criteria of GAD.

Additionally, marked gender differences have been reported in lifetime prevalence of GAD. In some studies, approximately twice as many women have been found to meet the diagnostic criteria of GAD than men (e.g. Carter, Wittchen, Pfister & Kessler, 2001; Wittchen, Zhao, Kessler & Eaton, 1994). Similarly, in community samples, a number of studies have found that women report more

worries than men (e.g. Dugas, Freeston & Ladouceur, 1997; Dugas, Gosselin & Ladouceur, 2001; Robichaud, Dugas & Conway, 2003).

### **1.2.5 Prevalence of worry in children.**

Worry has been found to be a common phenomenon in children and adolescents, as well as in adults. Of a sample of 193 8-13 year olds, over two-thirds reported that they worry 'now and then' (Muris, et al., 1998). Silverman, La Greca and Wasserstein (1995) found that children between the ages of 7 and 12 reported on average 7.64 current worries. Research into adolescent worry has found that 25% of adolescents experience excessive and uncontrollable worry (Fournier, Freeston, Ladouceur, Dugas & Guevin, 1996), of the type that may be associated with GAD. Similarly, Bell-Dolan, Last and Strauss (1990) found that 30% of their sample of 5 to 18 year olds reported some symptoms of excessive worry.

Prevalence of worry within the different age-groups of childhood is less well established. Vasey et al. (1994) identified that, although worrisome thoughts were common in children aged as young as 5, the prevalence of worry was greater in those aged 8 or above. Muris, Merckelbach, Gadet and Moulaert (2000) found worries increased across childhood, with under half of participants aged 4 to 6 reporting worries compared to three-quarters of 7 to 12 year olds.

Gender differences have also been found in the worry levels of children and adolescents, with girls tending to report higher levels of worry than boys (Muris et al. 2000; Silverman et al., 1995). Brown, Teufel, Birch and Kancherla (2006) however, found no gender difference in the weekly total of worries based on gender, although they found significant differences in some of the worry themes or boys and girls. Similarly, Muris, Merckelbach, Meesters and van de Brand (2002) found no

gender differences in the likelihood of reporting a personal worry in children aged 3-14.

Regarding pathological worry, Muris, Meesters, Mercklebach, Sermon and Zwakhalen (1998) found that, within a community sample of children, 6.7% met the DSM-III-R diagnostic criteria for either Overanxious Disorder (OAD; APA 1987) or GAD. However, as pathological worry can also occur as a part of other psychological disorders, the actual rate of children experiencing distressing levels of worry is likely to be greater than this study detected.

### **1.2.6 Worry and its relationship to psychological disorders.**

Excessive and uncontrollable worry is a central diagnostic criterion of GAD, according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association [APA], 2000). Worry is also implicated as an important feature in many other psychiatric disorders, including Panic Disorder (APA, 2000), Hypochondriasis (Wells, 1997), and Insomnia (Harvey & Greenall, 2003).

#### ***1.2.6.1 Generalised anxiety disorder.***

The diagnostic term GAD first appeared in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III, American Psychological Association [APA], 1980), as a residual category, featuring a number of non-specific anxiety symptoms. In the DSM-III-R (APA, 1987), the definition of GAD changed to ‘unrealistic/ excessive anxiety and worry about two or more life circumstances’, thus making worry a defining feature. The most current edition, DSM-IV-TR (APA, 2000) identifies excessive and uncontrollable worry as a central diagnostic criterion

of GAD. The diagnostic criteria for GAD now include: ‘Excessive anxiety and worry (apprehensive expectation), occurring more days than not for at least 6 months, about a number of events or activities (such as work or school performance)’ and the requirement that ‘the person finds it difficult to control the worry’.

In addition to placing worry at the centre of GAD, the DSM-IV-TR criteria for GAD also highlight many of the other disorders with which worry can be associated. For GAD to be diagnosed, it is emphasised that the primary focus of the worry must not be confined to “having a panic attack.... Being embarrassed in public.... Being contaminated.... Being away from home or close relative.... Gaining weight... having multiple physical complaints.... Or having a serious illness” (APA, 2000). These exclusions demonstrate the important role that worry can play in the precipitation and maintenance of other anxiety disorders.

#### ***1.2.6.2 Panic disorder/ agoraphobia.***

The DSM-IV-TR (APA, 2000) diagnostic criteria for panic disorder with (or without) agoraphobia includes as a prerequisite the ‘persistent concern about having additional attacks’ coupled with ‘worry about the implications of the attack or its consequences’. Accordingly, the experience of worry is a significant aspect of panic disorder.

Furthermore, researchers have begun to explore whether the experience of high levels of worry can be a predisposing factor in the onset of panic disorder. Nay, Thorpe, Roberson-Nay, Hecker & Sigmon (2004) suggest that chronic worry may increase the attention paid to physical panic cues, thereby increasing panic vulnerability. In an experiment conducted by Leen-Feldner, Feldner, Tull, Roemer and Zvolensky (2006), pre-experimental worry ratings were found to predict

participants' post-experimental ratings of panic attack symptoms, suggesting that high worry levels could be a predisposing factor in the onset of panic disorder.

### ***1.2.6.3 Hypochondriasis.***

Worry, specifically relating to possible signs or symptoms of illness, is a common feature of hypochondriasis, or health anxiety. As in panic disorder, the experience of worrying excessively about one's health can actually lead to somatic symptoms (such as insomnia, or increased heart rate), which then exacerbate the original worry. As in GAD, worry in these instances can be seen as a positive strategy employed either to identify the earliest symptoms of an illness, or as a superstitious avoidance of being unduly positive (Wells & Hackmann, 1993). Wells (1995) advocates the challenge of such meta-beliefs about worry as a key therapeutic intervention in hypochondriasis.

### ***1.2.6.4 Social phobia.***

The DSM-IV-TR definition of social phobia includes 'a marked and persistent fear of social or performance situations in which embarrassment may occur' (p. 450). Associated with this is a high level of worry relating to anticipated future social events, and the threats that they could contain. Wells and Carter (2001) found that individuals with a diagnosis of social phobia reported as high levels of worry as those with a diagnosis of GAD, in relation to social situations.

Again, worry in this context may be employed (most often unhelpfully) as a problem-solving technique, in which the individual rehearses possible responses to myriad worst-case scenarios. In this way, worry can serve to maintain social phobia by increasing individuals' perception of possible negative outcomes to social events.

#### ***1.2.6.5 Separation anxiety disorder.***

Additionally, in children, worry may be present as a feature of separation anxiety disorder. DSM-IV-TR diagnostic criteria include ‘persistent and excessive worry about losing, or about possible harm befalling, major attachment figures’ and ‘persistent and excessive worry that an untoward event will lead to separation from a major attachment figure’ as two of the criteria used to evidence separation anxiety disorder.

#### ***1.2.6.6 Insomnia.***

Some of the earliest research relating to worry revolved around its relationship to insomnia. In contrast with a priori expectations, early studies repeatedly found that it was cognitive intrusions (i.e. worries) that prevented individuals from sleeping, as opposed to physiological arousal (e.g. Lichstein & Rosenthal, 1980). Unsurprisingly, insomnia and GAD have been found to be frequently comorbid (e.g. Ford & Kamerow, 1989). In addition to being a possible predisposing factor in relation to insomnia, worry has been demonstrated to maintain the issue, most notably through individuals’ catastrophizing of the outcomes of poor sleep (Morin, 1993).

#### ***1.2.6.7 Depression.***

Worry has also been demonstrated to be closely associated with depression. Starcevic (1995) found that individuals with a diagnosis of Major Depressive Episode (MDE, DSM-III-R) reported similar levels of pathological worry as those diagnosed with GAD. In a study with a large clinical sample ( $N = 1200$ ), Chelminski and Zimmerman (2003) found that, although individuals with a diagnosis of GAD

reported the highest levels of worry, depressed participants (with a 'pure' diagnosis of Major Depressive Disorder with no comorbid anxiety disorders) reported as high levels of worry as those with other anxiety disorders.

Additionally, when worry is induced in an experimental setting, it has been found to induce anxiety and depression in participants in approximately equal amounts (Andrews & Borkovec, 1988). Some studies have therefore found the comorbidity rate of depression and GAD to be up to 90% (Brown, Marten & Barlow, 1995).

A similar association between worry and depression has been found in studies using child participants. Verstraeten, Bijttebier, Vasey and Raes (2011) found a positive correlation between worry and depression in 9 to 13 year olds, although this was to a lesser extent than the correlation between worry and anxiety.

#### ***1.2.6.8 Summary of relationship between worry and psychological disorders.***

Although worry is most commonly thought of as a defining feature of GAD, it is also implicated in many other psychological disorders in both childhood and adult populations. Consequently, a greater understanding of the processes involved in excessive worry may have implications for the treatment of a wide range of anxiety, mood and somatic disorders.

#### **1.2.7 Summary.**

To summarise, worrying is a common experience for both adults and children. In its mildest forms, it can be a useful motivating force and can aid problem-solving. However, pathological worry plays a role within a significant

number of psychological disorders. For this reason, a greater understanding of the nature and processes of worry has the potential to contribute to improved psychological interventions in the future.

### **1.3 Existing Research into Worry**

#### **1.3.1 History of research into worry.**

Research into worry was largely neglected prior to the 1980s (Davey et al., 1992). Preceding this, two predominant sets of beliefs limited the perceived value of research into worry. Firstly, it was widely held that worry was synonymous with anxiety, specifically as a cognitive manifestation of anxiety. Therefore, exploring worry, as opposed to anxiety in general, was unnecessary. Additionally, worry was often perceived as a commonplace, 'normal' phenomenon. Therefore worry was not seen as problematic or outside of everyday experience, and consequently its study was not considered within the remit of clinical researchers.

Early research into worry largely related to test anxiety, whereby the cognitive and physiological aspects of test anxiety were disentangled. Through this, it was identified that poor test performance was related to worry rather than the physiological components of test anxiety (Hembree, 1988).

Research into worry as it is now understood was largely facilitated by Borkovec and his colleagues (e.g. Borkovec, 1979). Initially focused on the experience of insomnia, Borkovec identified that worrying, rather than physiological arousal, was the major maintaining factor in sleeplessness. This led to a greater interest in the role of worry as a potentially problematic cognitive experience, underlying other psychological disorders.

The amendment of the diagnostic criteria for GAD in 1987 further highlighted the need for greater understanding of the process of worry. However, although the knowledge base regarding worry has increased over the past three decades, it is still a comparatively unknown and uncharted phenomenon. Although it is commonly cited that interest in the study of worry has increased over this period, Dugas (2000) conducted a systematic literature search into GAD (of which worry is the primary defining feature) and found that, although increasing in the 1980s, research publications into GAD levelled off in the 1990s, and were commonly one of the lowest researched anxiety disorders (accounting for between 5.2% to 8.5% of anxiety disorder publications during this period). Furthermore, Dugas identified that the majority of publications related to describing GAD and addressing treatment issues, as opposed to exploring the processes that relate to GAD. This reflects the limited research that has been carried out exploring pathological worry and its effects.

To date, the majority of research into worry within an adult population has related to its prevalence and content (see section 1.2). Additionally, correlational studies have sought to find associations between worry and hypothesised causal factors and underlying processes. However, it is through experimental research that definitive, causal associations can be made between worry and hypothesised factors which lead to its development or maintenance. It is this area of research which is most significantly lacking, particularly in relation to child and adolescent populations.

### **1.3.2 Research into childhood worry.**

Research into childhood worry is an emerging field. The vast majority of research conducted is into adult psychological disorders, and a common tendency is for assumptions to be made that these disorders present in the same manner in children (Cartwright-Hatton & Murray, 2008). However, the unique developmental and social contexts of children mean that it is unwise to make the assumption that their experience of childhood worry or related anxiety disorders are synonymous with those of adults. Therefore, discrete research focusing on childhood populations is essential in the development of understanding of such disorders, with the aim of eventually improving treatments and interventions.

Much early research into childhood worry related to the prevalence of worry within various child samples, as outlined in section 1.2.4. These studies share similar characteristics, in that they rely largely on the self-report of participants in regards to their worry content, frequency, and intensity. As with the adult research base, a significant amount of the research into childhood worry seeks to describe the phenomenon, for example by identifying the themes into which childhood worries tend to fall, and the frequency of worrying within various childhood populations. Such research has provided a number of findings relating to childhood worry.

#### ***1.3.2.1 Content of childhood worries.***

Several studies have explored the content of childhood worries. Silverman et al. (1995) explored the worries of a large community sample of 7 to 12 year old children. Most common worries related to health, school, harm befalling themselves or loved ones, and interpersonal relationships. A number of other studies have generated similar findings (e.g. Henker, Whalen & O’Niel, 1995; Muris et al., 1998).

Weems, Silverman and La Greca (2000) explored the worry content of anxious children and adolescents. Although the content of worries was found to be similar to those of non-anxious children, the intensity of the worries appeared significantly higher. However, the different settings in which clinical and nonclinical samples were interviewed within this study provides a potentially confounding variable which was unexplored. When comparing children with a diagnosis of GAD to that of a simple phobia, the frequency and content of their worries was similar, although those in the GAD group reported a greater number and intensity of worry.

As commonalities have been found between the worry topics of children who experience both low and high levels of worry, this suggests that it is not the type of worry that distinguishes the extent to which a child will experience excessive worrying. Worry topics have, however, been found to change over childhood and adolescence. For example, Muris et al. (2000) found that younger children were more likely to worry about separation from their parents, and older children more likely to worry about academic performance. With the exception of the topic 'being kidnapped' (reported more frequently by boys), no gender differences were identified in the worry topics of girls and boys within the study, although findings may have been affected by the use of solely male characters in the interview material.

Szabo and Lovibond (2004) sought to categorize children's worries by cognitive content, identifying 6 types of worry episode, relating to the primary purpose of the worry episode. The majority of worries were identified as reflecting an anticipation of future negative events, as would be predicted by the most frequent definitions of worry. However, worry episodes were also found to reflect problem-solving attempts and solution selection, rumination, or a palliative or self-blaming

function. Children within the clinical sample were more likely to engage in ruminative worrying, and less likely to employ worry as a problem-solving strategy.

Although these studies have provided a useful basis for understanding the content of children's and adolescents' worries, a number of limitations apply. Firstly, these studies rely solely on the self-reports of the participants, and do not seek to validate these reports using other means of information-gathering (such as parental report). This relies on the ability of the participants to recall and express the contents of their worries accurately within a research setting. Additionally, none of the studies seeking to explore the developmental changes in content of worries have employed a longitudinal design in order to validate the assertion that the worries of an individual are likely to change in content over the period of childhood.

#### ***1.3.2.2 Differentiating adult and childhood worry.***

Little research has sought to explicitly differentiate between the processes used by adults and children when worrying. Szabo (2009) looked at differences in the probability-cost ratio used by adults and children when deciding which topics warrant worrying about. The study found that younger children were likely to worry more about topics which they perceived to have a highly aversive outcome, regardless of how likely they thought that outcome would be. This is in contrast with adults and older adolescents, who are more likely to worry about topics they perceive to be relatively likely, although with a lower personal cost. Although this study was based on self-report using a closed worry questionnaire, which is argued not to be the most effective way to uncover children's own personal worries, it provides tentative evidence that children's levels of cognitive and emotional development may lead them to process worries in a different way to older individuals.

### ***1.3.2.3 Exploration of cognitive models of excessive worry and GAD in children and adolescents.***

As there are currently no child-specific models of the cognitive processes of worry, researchers have sought to explore the extent to which adult models of excessive worry (most commonly conceptualised as GAD) can be applied to childhood worry.

Several preliminary studies have suggested that the cognitive model proposed by Dugas et al. (1998) holds equal validity with adolescents as it does with adults. Laugesen, Dugas and Bukowski (2003) explored the validity of the model in a large ( $N = 528$ ) sample of adolescents aged 14 to 18. When comparing adolescents placed within the moderate or high worry group, both intolerance of uncertainty and negative problem orientation were found to discriminate between the two groups. These variables and positive beliefs about worry were also found to account for a significant amount of variance in worry scores. To date, no research has been published exploring whether this holds true for younger participants.

### ***1.3.2.4 Summary.***

To summarise, research has begun to explore the experience of worry within childhood, most successfully through identifying the content and prevalence of childhood worries. However, the mechanisms and processes involved in childhood worry are not well understood. Existing research has provided some indications that adult models may be applicable for younger populations; however this typically only extends to adolescents and not younger children. This gap in the research is particularly relevant given the evidence that children may reason in a different way to adults regarding their worries.

### **1.3.3 Existing measures validated for use with child participants.**

Cartwright-Hatton (2006) argues that the lack of validated measures of childhood worry has inhibited this research area. As in most other areas, researchers have sought to amend this by adapting existing measures for use with child participants. Currently validated questionnaire measures for use with children include the Penn State Worry Questionnaire for Children (PSWQ-C; Chorpita, Tracey, Brown, Collica & Barlow, 1997) and the Metacognitions Questionnaire for Children (MCQ-C; Bacow, Pincus, Ehrenreich & Brody, 2009). Additionally, the Anxiety Disorders Interview Schedule (ADIS; Silverman & Albano, 1996) includes a section on GAD, which assesses excessive worry across a number of domains.

#### ***1.3.3.1 Penn State Worry Questionnaire for Children (PSWQ-C, Chorpita et al., 1997).***

The PSWQ-C is a self-report measure of tendency to worry, based on an adaptation of the adult version Penn State Worry Questionnaire (Meyer, Miller, Metzger & Borkovec, 1990). Currently, the PSWQ-C is the most empirically studied and validated measure of childhood worry. Validation studies employing a community sample have demonstrated favourable levels of reliability and validity of the measure. In their initial study, Chorpita et al. (1997) found the 14-item version of the measure to have an internal consistency of Cronbach's alpha = .89, and good discriminant and convergent validity when compared to other measures of anxiety and depression. Additionally, they found the measure to have excellent test-retest validity over the period of one week ( $r = .92$ ). Muris, Meesters, and Gobel (2001) explored the correlation between PSWQ-C and various anxiety disorders, and found the more significant association to be between the measure and GAD, therefore

providing further construct validity. Pestle, Chorpita and Schiffman (2008) conducted similar investigations into the psychometric properties of the measure using a clinical sample, and again found high levels of internal consistency, convergent validity and acceptable discriminative validity between various diagnostic categories.

However, some amendments to the original form of the measure have been recommended. Muris et al. (2001) found that three reversal items included in the questionnaire did not add to the measure's validity or reliability, and therefore recommended an abbreviated 11-item version for 8-12 year olds. Similarly, Pestle et al. (2008) found that, with a clinical sample, removing the three reversed items improved the internal consistency of the measure from a Cronbach's coefficient alpha of .91 to .93.

Despite evidence of good reliability and validity, the PSWQ-C has a number of limitations. Although evidenced to be a good measure of self-reported tendency to worry, the PSWQ-C does not allow for measurement of the effects of experimental manipulation of worry. The generalised format of questions (e.g. "I have been a worrier all my life") and the strong test-retest validity suggest that, although well-suited as a measure of trait worry, its use in assessing dynamic worry states would be limited.

#### ***1.3.3.2 MetaCognitions Questionnaire for Children (MCQ-C; Bacow, Pincus, Ehrenreich, & Brody, 2009).***

The Metacognitions Questionnaire for Children explores some of the metacognitive processes and beliefs hypothesised to be related to worry. Originally designed as a measure of adult metacognitions (Wells, 1994), the measure was

initially adapted for use with an adolescent population (metacognitions questionnaire for adolescents; MCQ-A) prior to the development of the MCQ-C (suitable for ages 7-17).

The MCQ-C explores four potentially relevant metacognitive processes, including positive beliefs about worry (positive meta-worries such as “When I am confused, worrying helps me sort things out”), negative beliefs about worry (negative meta-worries such as “Worrying might make me go crazy”) superstitious, punishments and responsibility beliefs (such as “It is bad to think certain things”), and cognitive monitoring questions (such as “I pay a lot of attention to the way that I think”).

Early findings have indicated that similar metacognitive processes do occur in children and adults; and that these are associated with anxiety in children from the age of 7. However, as the measure focuses on underlying, hypothesised metacognitions as opposed to a direct measurement of worry itself, it would not be suited to use as a direct measure of childhood worry levels.

***1.3.3.3. Anxiety Disorders Interview Schedule, child and parent versions (ADIS-IV-C/P; Silverman & Albano, 1996) – Generalised Anxiety Disorder subsection.***

The ADIS-IV-C is a diagnostic tool which assesses excessive worry content, relating to eight domains of worry (school, performance social and interpersonal matters, perfectionism, health – self and others, family matters and current events. Children are asked to rate each domain from 0-8, dependent on the extent to which they worry about it (0 = not at all). A total score of up to 64 indicates the level of excessive worry content. This measure has been found to demonstrate both good

inter-rater and test-retest reliability (e.g. Rapee, Barrett, Dadds & Evans, 1994; Silverman & Eisen, 1992).

However, although this requires children to rate how much they worry about each of the 8 domains, it does not explore other factors relating to this, such as the frequency, intensity or duration of the worries.

Again, although it has been demonstrated to be a good diagnostic measure of excessive worry relating to the domains specified, this cannot be used as an experimental measure of worry, as it would not be anticipated that any experimental manipulation would affect children's responses to estimations of worries across all eight domains.

#### *1.3.3.4 Summary of existing validated measures of childhood worry.*

To summarise, existing validated measures of childhood worry relate to self (or parental) reports of worry content, tendency, and (hypothesised) associated metacognitive processes. Currently, no validated measure has the capacity to be used as an experimental measure of worry. This is an area of need that could potentially be filled by the catastrophizing interview technique.

### **1.4 The Catastrophizing Interviewing Technique**

An important development in understanding excessive worry within an adult population has been the introduction of the catastrophizing interviewing technique (Vasey & Borkovec, 1992). Based on the anxious, 'what if...' questioning style observed in chronic worriers by Kendall and Ingram (1987), this technique allows researchers to explore in detail the structure, content and perseveration of individual worry bouts (Davey, 2006).

Vasey and Borkovec developed this into a technique to measure the individual features of a catastrophizing worry bout. Following a two-minute period where participants were asked to list all of their current worries, the technique could then be used to explore further the worry in which they stated they had been most preoccupied over the past week. Participants would first be asked “what is it about [the worry topic] that worries you?”. Their response would then be followed with the question “what about [their given response] would you find fearful or bad if it did actually happen?” This question would be repeated, inserting each new response, until the participant was either unable to generate a new answer, refused to continue with the interview, or repeated the same general response three times.

Through this technique, Vasey and Borkovec were able to explore in detail the worry bout, and, by asking participants to rate their level of emotional distress at each stage, could explore the emotional impact of a catastrophizing worry style.

The original technique has been refined for use as an experimental research measure (Startup & Davey, 2001). Beginning with an identified worry topic, participants are asked to write down their response to the question “What is it that worries you about (X)?”. This question is then repeated, each time with X being replaced by the participant’s most recent response. As in Vasey and Borkovec’s original (1992) technique, this continues until either (1) the participant refuses to continue, (2) the subject is unable to generate another response or (3) the subject repeats the same general answer three times consecutively.

### **1.4.1 Research findings using the catastrophizing interview technique with an adult population.**

A number of useful findings have been made using the catastrophizing interview technique. It has allowed researchers to begin to understand what differentiates everyday worry from pathological worry, investigate the relationship between worry and other psychological disorders, and to explore experimentally the relationships between pathological worry and proposed cognitive factors.

#### ***1.4.1.1 Exploring differences between everyday and pathological worry.***

In the first study to use the catastrophizing interview technique, Vasey and Borkovec (1992) examined the catastrophizing worry style of two groups of undergraduate students – ‘worriers’ (who reportedly worried for 50% or more of the day) and ‘non-worriers’ (who reported worrying for 10% or less of the day). After spending two minutes identifying their worry topics, the catastrophizing interview technique was used, on the basis of the topic individuals reported that they worried about most. Worriers were found to produce significantly more catastrophizing steps than non-worriers ( $M = 14.2, SD = 9.74$  and  $M = 9.1, SD = 5.95$  respectively),  $F(1,43) = 6.2, p = .02$ , thus providing the first evidence for a difference in catastrophizing worry style between worriers and non-worriers. Using participants’ own worries for the interview task increased the ecological validity of the task, meaning that participants were more likely to follow the thought processes that occurred when spontaneously worrying about the chosen topic. The groups were not found to differ on the topics on which they worried, although there is the possibility that this was due to insufficient power of the nonparametric test used to analyse this. Importantly, the difference was found not to relate to the amount of time individuals

had previously spent worrying about the chosen topic. This provided evidence for Kendall and Ingram's (1987) assertion that a "what if" questioning style is an important aspect of pathological worry, and supported their suggestion that decatastrophization techniques may play a role in therapeutic interventions for disorders such as GAD. However, the use of a nonclinical sample means that caution must be applied in assuming that these results would hold true for individuals reaching clinical levels of worry (for example, in the form of GAD). Regardless, this study provided an important step in using the catastrophizing interview to investigate worry, allowing researchers to explore the processes of worry bouts in detail.

Hazlett-Stevens and Craske (2003) explored differences in threat interpretation between analog-GAD and non-anxious college students. Predictions that the analog-GAD group would generate more catastrophizing steps, and feel more distressed in relation to the interview steps were supported. This study differed in relation to previous uses of the catastrophizing interview as topics were provided by the researchers, as opposed to self-generated, allowing direct comparison of individuals' worry regarding the same topics. The finding that analog-GAD participants continued to generate more steps, despite the worry topics not necessarily reflecting personal worries suggests that the increased catastrophization demonstrated by worriers was not due to prior rehearsal of the worry topic. Additionally, the finding that predetermined topics can successfully be used with the catastrophizing interview technique further increased the value of the technique as an experimental measure, as it reduces the variability created by using participants' individual worry topics. However, the effect of mood (analog-GAD participants reported higher negative mood ratings throughout the task) was not controlled for, meaning that the correlations found must be interpreted cautiously, as it is possible

that the difference in number of interview responses between the two groups may be attributed primarily to differences in mood. Additionally, the researchers highlight the issue of using self-report measures as the sole method of data collection, due to the possibility of respondent bias and social desirability affecting responses.

Davey and Levy (1998) conducted six studies using the catastrophizing interview technique, in order to explore differences in catastrophizing worry characteristics of worriers and non-worriers. They found that worriers were able to generate more catastrophizing steps than non-worriers even on topics that they felt positively about, suggesting a general perseverative iterative style, as opposed to greater prior rehearsal of catastrophizing outcomes of their existing worries. This finding was replicated using a novel, hypothetical worry topic (whereby participants were asked to imagine the worries they would have if they were the Statue of Liberty), and again worriers were able to generate more steps on the interview than non-worriers,  $t(36) = 2.21, p < .05$ . Worriers were also able to generate more positive outcome steps on a 'reverse catastrophizing interview' (where they were asked to respond to 'what would be good' about each step) when related to the novel topic. This provides further evidence of a general perseverative iterative style. However, when asked to generate positive steps relating to their own worry this result was not found, suggesting that their negative associations with the worry topic prevented positive outcomes from being generated. The final two studies looked at the relationship between a sense of personal inadequacy and worrying. Results of the two studies were somewhat inconsistent, but found some indications that worriers are more likely to reach a conclusion that related to personal inadequacy than non-worriers. In summary, Davey and Levy's studies concluded that worriers were more able or willing to generate catastrophizing worries regarding both personal and novel

topics than non-worriers. By completing a number of studies using a variety of worry topics, including both personal and hypothetical worries, they clarified that the increased number of steps generated using the catastrophizing interview technique was not simply due to the greater rehearsal of worries by those prone to worry. As with previous studies, however, the high worry groups were selected from a community sample, and do not necessarily meet the criteria for GAD or any other clinical disorder in which worry plays a role. Consequently, results of this study cannot be generalised to the clinical population without exercising caution or conducting further investigations.

Provencher, Freeston, Dugas and Ladouceur (2000) investigated the differences in threat schemata between worriers and non-worriers. They found high worriers were more likely to generate more serious outcomes, using the catastrophizing technique, than low worriers. Additionally, high worriers rated these outcomes as more likely to occur than low worriers, demonstrating differences in perceived levels of threat. However, unlike the majority of studies using the catastrophizing interview technique, they failed to find a difference in number of steps generated by worriers and non-worriers. They suggest that differences between the methodology used in this study and the original Vasey and Borkovec (1992) technique may account for this. Furthermore, the small sample ( $N = 20$ ) and associated lack of power (unreported) may have obscured the relationship between worry and the number of steps generated, as the high worry group did generate a greater number of steps than the low worry group, although this did not reach statistical significance.

### ***1.4.1.2 Validating cognitive models of excessive worry and GAD***

*1.4.1.2.1 Cognitive model of GAD.* Davey, Jubb & Cameron (1996) used the technique to begin to explore one hypothesised cognitive process associated with pathological worry. By experimentally manipulating participants' levels of problem-solving confidence (a facet of problem orientation), they were able to use the catastrophizing interview technique to assess the effects of the manipulation on the number of catastrophizing steps generated. In line with their hypothesis, participants who experienced the problem-solving confidence reduction procedure generated significantly more steps on the interview than those in the increased problem-solving confidence group,  $F(1,36) = 13.67, p < .001$ . This held true even when differences in reported anxiety level were controlled for. However, the failure of the mood manipulation aspect of the experiment meant that the detailed analysis of the relative impact of negative mood and problem solving confidence could not be assessed. Regardless, as the first experimental study into this area, these findings provided valuable support to the cognitive model of GAD proposed by Dugas et al.

*1.4.1.2.2 Cognitive Avoidance Model.* Stöber, Tepperwien and Staak (2000) explored the relationship between concreteness of problem elaboration (a desirable trait in successful problem solving strategies) and worry. In the first of their studies, participants were asked to elaborate on their identified worry topics using "problem elaboration charts" designed by Stöber (1996). In the second study, participants were asked to elaborate on a number of worry topics using the catastrophizing interview technique. In both studies, the concreteness of their problem elaborations was assessed by researchers. Contrary to the beliefs held by many worriers, worry did not appear to lead to superior problem solving, and instead appeared to inhibit the

problem solving process. However, the correlational, rather than experimental, use of the catastrophizing interview did not allow for any causative relationship between worry and problem concreteness to be inferred. Regardless, the researchers concluded that the reduced level of concreteness supports the cognitive avoidance model of excessive worry (Borkovec, 1994), as concreteness is associated with ease, speed and vividness of imagery (Paivio, 1986). Therefore, they suggested that the production of less concrete worries is likely to assist in the avoidance of aversive imagery relating to worry topics. The use of two methods to investigate this relationship (although Stöber acknowledges that the problem elaboration chart lacks the ecological validity of the catastrophizing interview technique) provided further evidence for this interpretation, as results were consistent across the two studies. However, the use of a non-clinical sample in this study does not allow conclusions regarding the accuracy of this in individuals experiencing pathological levels of worry and the psychological disorders associated with this.

*1.4.1.2.3 Mood-as-input.* Johnston and Davey (1997) explored the relationship between the emotional content of TV news, mood and worry. They found that, following a negative TV news item, participants demonstrated a significant decrease in mood,  $F(2,27) = 12.06, p < .001$  and associated increase in the number of catastrophizing steps generated on the interview,  $F(2,27) = 5.15, p < .05$ . This provided evidence for mood-congruent theories of pathological worry, and also demonstrated an effective manner to manipulate mood for further experimental studies. The use of the catastrophizing interview as an experimental measure allowed for exploration of the causal effect of mood on worrying, as there were no pre-experimental differences between the mood or PSWQ scores of participants

placed within the positive, neutral and negative news story conditions. Although the study did not identify the means by which mood can affect worry perseveration, the findings contributed evidence towards the “mood-as-input” hypothesis of worry (Startup & Davey, 2001).

Startup and Davey (2003) used the catastrophizing interview technique to explore further the underlying processes by which pathological worriers continue to generate steps in the catastrophizing interview, long after nonworriers have spontaneously ended their worry bouts. They explored the ‘mood-as-input’ hypothesis of worrying (Startup & Davey, 2001), which suggests that a combination of an individual’s mood and their ‘stop rules’ for worrying would lead to perseveration and catastrophizing of worry topics. They hypothesised that, due to a greater sense of responsibility and reduced confidence in their ability to find a solution to their worries, worriers would employ as ‘as many as can’ stop rule when engaging in a worry bout. Using both self-generated and hypothetical scenarios, they found that high worriers would produce more catastrophizing steps than low worriers. As predicted, high worriers did report higher levels of responsibility for thoroughly addressing all possible outcomes of the worry topic (thereby creating more catastrophizing steps). To further elaborate on this finding, Startup and Davey followed this with an experimental manipulation of responsibility level and mood. Having successfully manipulated the mood and sense of responsibility of participants, they found that those with an induced negative mood generated significantly more steps on the catastrophizing interview,  $F(2,29) = 7.42, p < .01$ . However, the results of the responsibility manipulation were mixed. As predicted, within the negative mood group, those with an induced high responsibility generated more steps than those in the low responsibility group. In the positive mood groups,

the reverse was true. These findings demonstrated the causal effect of both inflated responsibility and negative mood in perseverative worry, and the importance of the relationship between the two factors in leading to worry perseveration. Startup and Davey concluded that this could indicate a variety of stop rules being employed – with the ‘as many as can’ stop rule being in operation when under a condition of high responsibility, as a ‘feel like continuing’ stop rule when in a low responsibility group. However, as no steps were taken to identify the actual stop rules used by the participants, this suggestion can only be made tentatively on the basis of this research. Although failing to reach a definitive conclusion, the use of the catastrophizing interview technique as an experimental paradigm allowed for some of the complexity of the relationship between stop rules, mood and perseverative worry to begin to be explored.

This research was continued by Davey, Startup, MacDonald, Jenkins and Patterson (2005), who explored the number of catastrophizing steps generated by participants in relation to their reported stop rules, trait worry, trait anxiety and current emotional state. In contrast to previous studies (e.g. Startup & Davey, 2003), they identified each participant’s own self-reported stop rule prior to the interview task, as opposed to imposing stop-rule strategies in participants in an arbitrary manner. This allowed the relationship between stop rules and worry to be explored in a more ecologically valid manner. The only significant correlation they found between the number of catastrophizing steps generated and the other main variables was that with the ‘as many as can’ stop rule. The unexpected lack of significant correlation between catastrophizing steps and trait worry score (determined using the PSWQ) could be explained by the small number of participants ( $N = 30$ ) and associated lack of power (unreported). Despite this lack of correlation between the

two measures of worry, an “as many as can” stop rule was found to correlate significantly with both trait worry ( $r = .545, p < .002$ ) and worry perseveration ( $r = .437, p < .05$ ), thus providing further evidence that beliefs about the nature of worry may play a role both in the trait worry of individuals and in their behaviour during a worry bout. Davey et al. (2005) suggest that these findings have implications for the treatment of pathological worry (e.g. GAD). However, given the non-clinical nature of the sample used in this study, caution must be used when applying findings to clinical populations.

Taken together, these studies provide support for the ‘mood-as-input’ hypothesis of perseverative worry, and suggest that therapeutic interventions targeting individuals' meta-beliefs regarding worry could be beneficial for those experiencing pathological levels of worry and associated disorders.

#### ***1.4.1.3 Exploring the relationship between worry and other psychological disorders.***

Harvey and Greenall (2003) used the catastrophizing interview technique in order to examine the relationship between worry and insomnia, specifically addressing individuals' worries regarding the outcome of poor sleep. In support of the suggestion made by Borkovec (1982), individuals with insomnia generated more catastrophizing steps than individuals who reported good sleep patterns, therefore supporting the relationship between excessive, catastrophic worry and insomnia. However, the lack of experimental manipulation of any factors within this study means that a causal relationship could not be inferred – it is as likely that poor sleep leads to worry as it is that worry leads to poor sleep (although the probability is that both of these are true in the maintenance of insomnia). Therefore the study fails to

provide a significant contribution to understanding of the contribution worry may make to the maintenance of insomnia. The demonstration of an association between insomnia and catastrophic worry, however, does provide a direction for future experimental studies, as the catastrophizing interview technique has the potential to be used for both correlational and experimental studies.

#### **1.4.2 Use of the catastrophizing interview technique with children and adolescents.**

The area in which childhood worry research is most significantly lacking when compared to the adult literature base is that of experimental research. Even more so than with adult participants, the lack of validated measures inhibits the accurate measurement of dependent variables, therefore limiting researchers' ability to draw experimental conclusions regarding childhood worry. The catastrophizing interview technique has the potential to be used as an experimental measure of childhood worry. However, to date very few studies have attempted to use the catastrophizing interview technique with children.

Vasey et al. (1994) used a version of the technique to compare worry processes of children aged between 5 and 11 years old. They asked children to elaborate on worries generated using a verbal vignette, and found that older children (aged 8-11) were able to generate more worries than children aged 5-6. This study provided the first evidence that the catastrophizing interview technique may be appropriate for use with children, although four of the participants aged 5-6 were unable to produce worry topics and were therefore excluded from the analysis. No difference was found in the worry elaboration of 8-9 and 10-11 year olds, supporting prior research (e.g. Brown, O'Keefe, Sanders, & Baker, 1986) which has suggested

that the ability to catastrophize is developed by middle childhood. However, they did not assess the children's pre-existing levels of worry or anxiety, or their cognitive or verbal ability. Consequently, although they were able to provide evidence that children from the age of 8 may be able to catastrophize in a similar manner to adults, they failed to establish whether this related to children's actual levels of worry in the same manner as within an adult population.

Gregory (2009) used the catastrophizing interview technique in order to explore the relationship between insomnia and catastrophizing worry in children aged 8-10 years old. Although the use of a community sample allowed a relatively large sample size ( $N = 123$ ), this resulted in a relatively low number of children reporting any catastrophizing worries (72% of the sample reported no catastrophic thoughts regarding sleep difficulties). The proportion of participants reporting sleep difficulties using the sleep self report measure (SSR; Owens, Maxim, Nobile, McGuinn, & Msall, 2000) is unclear, as no normative data is reported to aid interpretation of the scores. In accordance with findings from adult research, a significant correlation was found between catastrophizing and sleep disturbance, suggesting that worry may play a role in sleep disturbance in children as well as adults. However, as with the research conducted by Harvey and Greenall (2003) using adult participants, the use of the catastrophizing interview technique as a correlational measure does not allow for inferences to be made regarding a causal relationship between the factors. Additionally, Gregory highlights the untested nature of the catastrophizing interview technique with this age-group, and the possibility that demand characteristics may affect the responses provided by children.

Turner and Wilson (2010) used the technique in an experimental study to investigate the impact of mood on the use of stop-worry techniques with participants aged 11 to 13. In a similar investigation conducted with an adult population by Startup and Davey (2003), Turner and Wilson used the technique to investigate whether mood and stop-rules impacted on children's worry perseverance. They found that the number of steps generated on the interview was significantly negatively correlated with measures of happiness, and that participants assigned to the 'High worry' group produced significantly more steps than the 'Low worry' group. However, they acknowledge that it was not clear whether children were persevering with the interview due to social demand variables, or indeed were ending the interview prematurely for similar reasons.

#### **1.4.3 Critique of the catastrophizing interview technique.**

Use of the catastrophizing interview technique has allowed researchers to begin to examine directional relationships between worry and other psychological processes. The technique allows researchers to explore in-depth the features of a worry bout, and to look in greater detail at the process of catastrophization. The findings that differences can be detected between groups of worriers and nonworriers regarding their responses to personal worries (e.g. Vasey & Borkovec, 1992), common worries (e.g. Hazlett-Stevens & Craske, 2003) and entirely novel worry topics (e.g. Davey & Levy, 1998) demonstrates the flexibility of the technique. This is advantageous when using the technique as an experimental measure, as it allows repeated administration and consistency of worry topics across participant groups. However, although the technique appears to mimic a worry bout more closely than some other measures (e.g. the problem elaboration chart developed by Stöber, 1996),

researchers must be wary when assuming the ecological validity of the technique as a direct examination of a naturalistic worry bout. Features of the interview, such as verbalising worries and responding to interviewer prompts, differ from the internal process commonly experienced by worriers. Regardless of this, it has proved a useful technique for the exploration of worry within a research setting with adult participants.

#### **1.4.4 Summary of the use of the catastrophizing interview technique.**

To summarise, the catastrophizing interview technique has been used in a number of ways: to clarify differences between normal and pathological worry bouts; to explore the relationship between worry and other disorders; and to identify relationships (both directional and correlational) between catastrophic worry and other psychological and cognitive processes. In particular, its use as an experimental measure has allowed researchers to begin the process of validating cognitive models of excessive worry. To date, the majority of research has focused on non-clinical samples, and consequently caution must be applied when generalising the findings to those with a diagnosed clinical presentation. However, there is no indication that the interview technique could not be applied equally successfully to research using clinical populations. Although it has been tentatively used in research with a child and adolescent population, with some success, to date no researcher has sought to validate its use as an experimental measure with children.

#### **1.5 Strengths and Limitations of Current Research into Worry**

Research into worry is still in its infancy. Understanding of this phenomenon therefore lags behind that of other psychological processes and disorders. This

scarcity of research has been suggested to be due to ambiguity in the definition of worry, and a lack of a reliable measure of worry (Eysenck, 1992).

Much of the research into worry has related to its prevalence within various populations, as researchers have sought to understand what it is that individuals worry about, and the frequency and intensity of the worries of different groups of people. Although these studies are of value in understanding the scope of the problem of excessive worrying, and in beginning to identify particular groups for whom worry may become a significant issue, descriptive studies lack the ability to provide explanations for why it is that worry can become a problem for some individuals, whilst for the majority it is simply a common, but not distressing, experience.

Other studies have gone further in beginning to identify what other cognitive processes are associated with (and therefore potentially a predisposing or maintaining factor of) excessive worry. Studies have also provided further evidence for the widespread experience of excessive worry, and its impact on many individuals outside of the diagnostic category of generalised anxiety disorder. However, the majority of research into excessive worry continues to focus on its role as a feature of generalised anxiety disorder.

One of the most significant gaps in the research literature for worry concerns the use of experimental methods to determine causal relationships between worry and other factors. As worry has been demonstrated to be a normal phenomenon experienced by the majority of the population (e.g. Tallis et al., 1994), measures which merely identify the presence of worry are insufficient when investigating the pathological nature of worry or its relationship to psychological disorders.

In order to definitively identify causal factors in the development of excessive worry, experimental research is required. By experimentally manipulating variables and assessing the impact of this on levels of worry, causative relationships between various cognitive processes and excessive worry can be determined. One commonly cited reason for the lack of experimental research into worry is the difficulty researchers have experienced in attempting to measure this hidden, cognitive phenomenon (Davey, 2006). Experimental measures of worry, which are sufficiently sensitive to the manipulation of causal factors, are required. Some researchers have attempted to overcome this by producing their own, study specific, measures of worry (e.g. Ladoucer, Gosselin & Dugas, 2000). However, in order to measure the dependent variable of worry, only three self-report questions were asked, requiring participants to rate their level of worry regarding the fictional outcome of the experimental task. Although the results did indicate a higher level of worry in the group whose intolerance of uncertainty was increased (therefore supporting this as a possible causal factor in excessive worry), the use of a crude, non-validated measure of worry reduces somewhat the overall validity of the study.

In general, the use of non-validated measures of dependent variable outcome is a significant issue when conducting experimental research. Ideally, outcome measures used in experimental research will have been previously demonstrated to have good levels of validity, reliability, and have the ability to be used both pre- and post-experimental manipulation, in order to ensure that it is indeed the manipulation of the target variable that has elicited the change in response. The catastrophizing interview technique (Vasey & Borkovec, 1992) is one such measure that has been developed for use with the adult population, in order to assess excessive worrying.

Its validation for use with children could allow for a greater understanding of the worry processes experienced in youth.

## **1.6 Child Development and Psychological Research**

### **1.6.1 Overview.**

When conducting research in order to increase understanding of childhood psychological processes, it is essential to consider what is known in relation to child development, particularly in terms of cognitive development. This section briefly outlines some of the key theories of cognitive development, and their implications for understanding childhood worry, before considering the importance of keeping these developmental issues in mind when applying adult models and measures to children (both in general and specifically to the catastrophizing interview technique).

### **1.6.2 Theories of cognitive development.**

Worry, as a cognitive activity, is not present from birth or infancy (unlike the physiological aspects of anxiety). Worry is a complex activity which requires a multitude of cognitive abilities, including memory, verbal expression, anticipating future events and linking cause and effect. The ability to worry develops over childhood, with children typically able to express basic worries from the age of five (Vasey et al., 1994). However, it has been demonstrated that childhood worries are not necessarily the same as those of adults in terms of content or process (Muris, Meesters et al., 1998; Szabo, 2009). Inevitably, as worry is a complex cognitive process, children's stage of development has the potential to affect both their ability to worry, and also their ability to engage in the catastrophizing interview tasks.

Considering theories of cognitive development can consequently aid understanding of the development of worrisome thoughts during childhood.

#### ***1.6.2.1 Piaget's theory of cognitive development.***

Jean Piaget (1952) developed the first comprehensive theory of cognitive development. Piaget's stage model posited that children move through four distinct stages of cognitive development from birth to the age of twelve. The first of Piaget's stages is the sensori-motor stage (0-2 years), where infants begin to understand the world through their sensory abilities. This is followed by the pre-operational stage (approximately 2-7 years) during which a child begins to develop a limited internal representation of the world, as thought and language are acquired. For example, children within this stage are unable to hold multiple perspectives or possibilities regarding an issue. This is followed by the concrete operational stage (ages 7-12), in which children develop the ability to use logic to solve problems, although in a concrete, rather than abstract, manner. The final stage (from around 12) is the formal operational stage, in which children are able to use abstract reasoning and systematic deductions to solve hypothetical problems, and can engage in hypothesis testing.

Piaget's theory has been criticised for the rigidity of its hierarchical stage format, and the fixed ages at which Piaget stated these stages occurred. Uzgiris (1964) for example demonstrated that children were able to pass conservation tasks with some materials but not others, thus undermining Piaget's assumption that each stage is characterised by content unspecific mental operations. It is generally recognised now that children are able to acquire skills at an earlier age than suggested by Piaget, if tasks are conducted in an age-appropriate manner (e.g. Baillargeon, 1987). At the other end of the spectrum, Wansink and van Ittersum

(2005) found that adults often do not demonstrate skills such as conservation which would be expected by early adolescence. Additionally, cultural differences have been found to be an important factor in the realisation of the different stages and their abilities (Butterworth and Harris, 1994).

Despite these limitations, Piaget's work can aid understanding of the development of worry in children. As a verbal, cognitive process, the ability to worry emerges during the pre-operational stage, as children develop the ability to mentally construct the world and express their thoughts. Worries at this stage, however, are limited in their scope and content. From the age of approximately 8 (within the concrete operations stage), children begin to express worry bouts in a similar fashion to adults, as their ability to anticipate future events increases. It is only from late childhood or early adolescence however, that individuals are able to show the complex, detailed worry bouts seen in adulthood. The ability to engage in abstract, rather than concrete, thought, and to hold multiple possibilities in mind, is a feature of the formal operational stage suggested by Piaget as the final stage of cognitive development.

#### ***1.6.2.2 Vygotsky's social constructivist theory.***

An additional criticism of Piaget's theory is the assumption that children learn on a spontaneous, individual basis, irrespective of their environment. In contrast to this, Vygotsky's (1978) theory focused on the cultural and social nature of cognitive development. Vygotsky suggested that "all higher mental functions are internalized social relationships". In his view, the development of thought was a product of the development of language, and that internalised, inner speech reflected the dialogue children had within their social environments. This theory provides a

means of understanding the role of parents and other individuals in the development of childhood worry.

### ***1.6.2.3 Information processing models.***

‘Neo-Piagetian’ theorists aimed to develop a further understanding of stages of cognitive development based on the complexity of information processing required at each stage. The work of several key Neo-Piagetians, who sought to extend and overcome the criticisms of Piaget’s original model, led to the development of the information processing theories of cognitive development.

*1.6.2.3.1 Relational Complexity theory.* Halford’s Relational Complexity (RC) theory (e.g. Halford, Cowan, & Andrews, 2007) proposes that reasoning ability is constrained by capacity limits, in much the same manner as working memory is limited by its storage capacity (Baddeley, 1986). Halford et al. (2007) suggest that cognitive ability can partly be understood in terms of how many relations or dimensions individuals can process in parallel. As cognitive development progresses, individuals are able to simultaneously consider an increasing number of interrelationships between elements, and are consequently able to process increasingly complex problems and scenarios. Initially, children are thought to only be able to process binary relationships (for example, understanding the concepts of “bigger” and “smaller”). Research suggests that the ability to compare two items in this manner is present from approximately the age of two (Halford, Wilson & Phillips, 1998), with ternary relationship processing emerging from the age of 4-5, and quaternary relations from around 11 years old. As these abilities develop, increasingly complex relationships can be analysed, with an increasing number of

interrelationships between factors. Additionally, as cognitive ability progresses, individuals become more able to use strategies to reduce processing loads, through either chunking (recoding multiple pieces of information into a single conceptual idea) or segmentation (breaking complex issues into a series of simpler steps).

Clearly, the complexity of interrelated factors that an individual can consider has implications for their ability to worry about future events. As the processing ability of children increases, as does their ability to worry about multiple, potential future events. Halford's assertion that children begin to process interrelationships between three factors from the age of 4 to 5 is in accordance with research suggesting that the ability to worry emerges at this age (e.g. Vasey et al., 1994), as children begin to be able to process relationships between themselves, the worry object, and the possible outcome. The ability to consider an increasing number of interrelationships accounts for the increasing complexity of worries and possible outcomes considered by older children and adolescents.

*1.6.2.3.2 Cognitive Complexity and Control theory.* Similarly, Cognitive Complexity and Control (CCC) theory (Zelazo, Muller, Frye, & Marcovitch, 2003) sees children's increasing complexity of thought as dependent on the complexity of rules they are able to use to process the world. Research has found that children initially develop the ability to use single rules, before becoming able to switch flexibly between two rules, and then to switch between two incompatible pairs of rules (Bunge & Zelazo, 2006). Finally, they are able to hold hierarchical sets of multi-component bivalent rule pairs in their minds, allowing the flexibility of thought seen in older children and adolescents (Zelazo et al., 2003). This increased

flexibility is reflected in ability of older children to identify multiple possible outcomes to scenarios, creating the complexity of worry bouts seen in late childhood.

*1.6.2.3.3 Mental model theory.* Conditional reasoning (the ability to make if-then connections) is an essential aspect of worry processes. Although Piaget posited this as an advanced skill not emerging until the formal operations stage (Inhelder & Piaget, 1958), other researchers have demonstrated that it is present from earlier in childhood (e.g. Dias & Harris, 1990). Johnson-Laird (2010) suggests that an important aspect of reasoning is the presence of mental models, internal constructions of the world based on previous experience and knowledge. It is these mental models which create sets of possibilities relating to if-then conditional statements (Johnson-Laird, 2009), allowing individuals to predict possible outcomes to actions or events. When faced with an “if-then” conditional statement, Johnson-Laird suggests that children will tend to only identify one possibility, whereas young adolescents can identify an alternative and older adolescents and adults yet more (Johnson-Laird, 2009). Evidence for this was provided by a series of experiments comparing the conditional reasoning abilities of grade 3 (8-9 years old), grade 6 (11-12 year old) and grade 9 (14-15 year old) children (Barrouillet, Lecas, 1998), which found a developmental trajectory in the number of mental models participants could construct simultaneously. As children’s cognitive skills develop, both their number of mental models and their ability to activate them increases (Markovits & Barrouillet, 2002), allowing conditional reasoning to become increasingly complex and context dependent. As worry seems to relate primarily to predicting future “if-then” occurrences, the increased ability to reason in these terms, and the greater

number of mental models held regarding possible future events would be expected to have an impact on the scope for individuals to worry.

*1.6.2.3.4 Hypothetical thinking theory.* Evans' (2007) hypothetical thinking theory relates to higher-level skills such as reasoning, judgment and decision making. Being able to process hypothetical conditional statements is a central skill in understanding causal relationships and making sense of the world (Evans, 2008). This has been integrated into his dual-process model, which suggests both heuristic processing (type 1 thinking) and analytic processing (type 2 thinking) feature in understanding. Heuristic processing refers both to innate, automatic processing, and experiential learning which has been repeated to the extent that it is automatic (Stanovich, West & Toplak, 2011). Type 2 thinking involves the ability to generate hypothetical representations in order to predict outcomes and the relative merits of different options. This requires significantly greater cognitive control and capacity than type 1 thinking.

This model suggests that contextual effects such as belief biases affect judgment and reasoning increasingly from early-late childhood to early adulthood, then decrease as analytic reasoning improves (Evans 2011). However, even in adulthood research participants have been demonstrated to rely on intuition rather than logical reasoning to problem solve (e.g. Klauer, Musch & Naumer, 2000), demonstrating the importance of both type 1 and type 2 thinking across the lifespan.

Both type 1 and type 2 thinking can be seen to relate to the process of worry. Over the course of childhood, associations between actions and events may be over-learned to the extent that they become implicit, automatic beliefs, which shape the individual's understanding of the world. Additionally, the development of explicit

hypothetical thinking is central to the ability to worry, as the majority of worries relate to theoretical, future events which have frequently not directly been experienced by the individual.

*1.6.2.3.5 Summary of the implications of information processing models for worry in childhood.* Information processing models have allowed researchers to explore the ways in which thinking and reasoning abilities develop over the course of childhood. Building on Piaget's stage theory, researchers have suggested a number of frameworks to account for cognitive development, suggesting that reasoning is limited by the number of simultaneous rules and relationships which an individual can hold in mind. As childhood progresses, individuals are more able to process conditional if-then relationships, and to generate hypothetical simulations to facilitate abstract reasoning.

In relation to the development of worry over childhood, these theories can be seen to provide an explanation for the increasing ability of children to hold multiple possibilities for the future in their minds, and to anticipate and predict future events and the consequences of their actions: all characteristics of a worry bout.

#### ***1.6.2.4 Functional neuroanatomical research into cognitive development.***

The scientific developments of the last few decades have allowed researchers of child development to move from cognitive theories to a greater understanding of the biological changes within the brain that allow the maturation of thought that occurs over the course of childhood and adolescence. Using fMRI (functional Magnetic Resonance Imaging), Rapoport et al. (1999) found evidence of significant changes within the frontal lobe just prior to puberty (peaking at the age of 11 in girls

and 12 in boys), impacting on executive functions such as planning and reasoning. Giedd et al.'s (1999) longitudinal study showed growth during this time in the pre-frontal cortex, which is the area of the brain associated with planning, working memory, organization and modulating mood. Thompson et al. (2000) report areas of growth from the ages of 6 to 13 in the areas connecting the temporal and parietal lobes, which relate to language and spatial relations. Additionally, they show that growth in the corpus callosum (the fibre system that relays information between hemispheres of the brain) increased rapidly before and during puberty, influencing language and associative thinking.

Taken together, these studies demonstrate that middle to late childhood is a period of significant development for certain structures within the brain, specifically areas which deal with language, reasoning, planning, and the management of emotions. However, it has also been shown that these structures, and the connections between them, continue their development until early adulthood, meaning that cognitive processing and executive functions are not fully developed until the end of adolescence (Supekar, Musen & Menon, 2009). As these skills are intrinsic in the ability to worry, these findings suggest that childhood worry processes may differ structurally to those of older adolescents and adults.

#### ***1.6.2.5 Summary.***

All theories and studies of cognitive development recognise that cognitive abilities change dramatically over the course of childhood. Early theorists such as Piaget saw children as proceeding through a number of linear stages of development; more recently researchers have sought to understand increases in cognitive ability in terms of improved information processing and neuroanatomical growth.

Consideration of these theories and research findings is vital when seeking to understand the development of worry during childhood. As worry is a complex cognitive skill, it cannot be assumed that children, regardless of developmental stage, worry in the same manner as adults or adolescents.

### **1.6.3 Applying adult models to children.**

The development of psychological models most frequently originates in the study of adult participants (Cartwright-Hatton & Murray, 2008). As the interest in child psychopathology has increased, these models have typically been ‘downsized’ for use with children, often with little or no assessment of the appropriate nature of the model for a childhood population. More recent research has found evidence for the application of cognitive models of various anxiety disorders to adolescents, for example Wells’ (1995) model of Generalised Anxiety Disorder. However, as Cartwright-Hatton highlights, there is still little evidence for the application of adult psychological theories and models to younger children (although neither is there compelling evidence that such models should not be used). Increasingly, researchers are beginning to explore the unique developmental issues relating to childhood, and amend models of childhood psychopathology accordingly. For example, the roles of learning, parental modelling and intergenerational processes form a key aspect of some new models of treatment of childhood anxiety (Cartwright-Hatton & Murray, 2008).

It has also been the case that the majority of psychological measures used with children have their origins in adult psychopathology (e.g. the PSWQ-C, MCQ-C, etc). Again, assumptions are made regarding the appropriateness and validity of the measures with this age-group. However, without rigorous empirical testing, it

cannot be assumed that adult models and measures can be generalised to the child population (Pestle et al., 2008). There is a tendency within research to either view child participants as either exactly the same as adult participants - therefore assuming that the same measures and approaches apply - or entirely different, thus meaning that adult measures cannot be applied at all to children (Punch, 2000). However, James et al. (1998) suggest viewing children as similar to adults but with different competencies. Consequently, the specific stage of child development and its implications should be considered when adapting psychological measures for use with younger age-groups.

#### **1.6.4 Developmental considerations when applying the catastrophizing interview technique to children.**

From the preliminary findings of Vasey et al. (1994), Gregory (2009), and Turner and Wilson (2010), it appears that the initial use of the catastrophizing interview technique with children and adolescents has elicited some promising results, and that it has the potential to be a highly valuable, experimental measure of worry in childhood. Brown, O'Keefe, Sanders and Baker (1986) found evidence that children and adolescents aged 8 to 18 years old showed evidence of catastrophizing thought processes, suggesting that the catastrophizing style of worrying experienced in adulthood may apply also to younger individuals. However, children's social, cognitive and emotional development must be considered when applying any measure or technique designed for an adult to population to children.

#### ***1.6.4.1 Cognitive development.***

Worry has been identified as a primarily cognitive process, which requires the ability to anticipate future events, and to elaborate on them. In accordance with Piaget's stages, research has established that by the age of approximately eight years old, children have the ability to worry in a similar fashion to adults (Vasey et al., 1994), as they are able to identify multiple potential outcomes to events. However, the use of the catastrophizing interview technique may still be hampered by the concrete nature of children's thought processes, meaning that the ability to engage in an abstract task such as the catastrophizing interview may not emerge until the final stage of cognitive development.

Additionally, the catastrophizing interview technique does not simply rely on the ability of children to catastrophize. As a verbal technique, participants must also be able to verbally express their worries. It is important, therefore, to identify whether the number of catastrophizing steps generated is primarily associated with participants' tendency to worry, or whether differing levels of verbal ability overshadow this relationship.

Consequently, two key aspects of cognition must be considered when assessing the validity of verbal measures of worry such as the catastrophizing interview. Verbal reasoning has been demonstrated to be a good indicator of overall level of intellectual capacity, thus informing the researcher of a participants' probable level of cognitive ability. Verbal fluency measures give an estimation of individuals' ability to express their worries in the manner required by the catastrophizing interview.

#### ***1.6.4.2 Social development.***

An inherent power differential exists between adult researchers and child research participants (Christensen, 2004), primarily due to the age disparity between the two (Mauthner, 1997; Mayall, 2000). As highlighted by Zwiers and Morrisette (1999), this imbalance of power and status can lead children to seek approval from adults, especially those perceived to be in positions of authority. Therefore, there is an increased danger of child participants feeling unable to respond in an honest manner to interview questions, due in part to cultural expectations and the desire to provide the adult researcher with the 'correct' response. This trait can be captured using a measure of social desirability (tendency to present oneself in a favourable light). Dadds (1998) investigated the effects of age on social desirability, and found that children's social desirability ratings fell with age (age range 7-14), indicating that younger children are more likely to respond with socially desirable answers.

Children may give inaccurate reports within research for a number of reasons, including the desire to please the researcher or say what they think the researcher wants to hear (Gersch 1996; Richman, 1993). Children who are particularly keen to please authority figures may be more likely to try harder to answer the interviewer's questions (and thus produce more steps in the interview).

Waterman, Blades and Spencer (2004) investigated whether child participants (aged 5-9) would attempt to answer questions that they did not know the answer to. It was found that the type of questions asked (for example open versus closed questions) and the stance the researcher took regarding their own expertise, affected the likelihood that children would attempt to answer questions to which they could not possibly know the correct answer.

In regards to using the catastrophizing interview technique with children, it is therefore important for the interviewer to reduce the likelihood of response bias through the use of open questions (as is characterised by the interview technique) and emphasis on the child's own expertise regarding their worries. Additionally, in order to investigate the participants' likelihood of responding with the answers that they think the researcher wants to hear, a measure of social desirability can be used. This assesses participants' likelihood of exaggerating their socially desirable behaviours and minimising their socially undesirable behaviours. Intuitively, children who are more sensitive to the power imbalance between themselves and the researcher, and those who are eager to please the researcher, are likely to score more highly on scales of social desirability.

#### ***1.6.4.3 Emotional development.***

Children's level of emotional development may affect their ability to effectively regulate their emotions (Holodynski & Friedlmeier, 2006). This could impact on the use of the technique in several ways – for example, children may prematurely terminate the interview or avoid thinking about worries in order to prevent emotional arousal, or the interview may have to be terminated due to increasing levels of emotional distress. Researchers must therefore be sensitive to the emotional arousal of participants, and consider the effects of this on the use of the catastrophizing interview technique with children.

### **1.7 Rationale for Study**

As this introduction has shown, worry is a commonly experienced psychological process which is associated with a number of disorders. Compared to

other aspects of anxiety disorders, research into worry is scarce and there are significant gaps in the current knowledge base regarding childhood worry. The catastrophizing interview technique has the potential to be a valuable tool in further understanding worry in childhood. Particularly, it can be used as an experimental paradigm to identify causal relationships between various factors hypothesised to be important in the development of problematic worry in childhood. However, in order for the interview to be effectively used as an experimental measure, its consistency across administrations needs to be established. Given the likelihood of practice effects if a participant was required to respond to the same worry topic pre- and post-experimental manipulation, it is important to establish that participants' responses are consistent across a range of worry topics. Therefore, assessing the alternate form reliability of the measure is an important aspect of its validation. Additionally, uncertainty regarding the validity of the technique for use with child participants means that it cannot be simply transposed to childhood research without further analysis. Specifically, the impact of varying levels of cognitive, social and emotional development should be considered when exploring the use of this measure with a childhood population.

### **1.7.1 Clinical relevance of the research.**

Although the catastrophizing interview technique is considered primarily a research, rather than clinical, tool, its development for use with children could have lasting clinical implications. The importance of linking clinical interventions to a solid evidence base has increased in recent years, with a focus on evidence-based practice and research-driven treatment. The lack of research into childhood worry (which is a recognised factor in a number of childhood disorders), has limited the

scope of evidence-based interventions. Although some research has tentatively used the catastrophizing interview technique with children, the lack of validation of this measure with this population means that limited conclusions can be drawn from the studies. Validation of the catastrophizing interview technique with children is therefore a vital first step in increasing the range of research that can be conducted into childhood worry.

Cartwright-Hatton, Roberts, Chitsabesan, Fothergill and Harrington (2004) conducted a systematic review of the efficacy of CBT for anxiety disorders in childhood and adolescence. They reported a success rate of 56.5% in CBT groups (as compared to 34.8% in control groups). Whilst this indicates a significant effect of having CBT, the relatively low success rate (with 43.5% of those receiving CBT not reaching criteria for remission), indicates that further understanding of the processes involved in anxiety disorders (including worry), could be beneficial in improving the efficacy of treatment plans.

Understanding the specific cognitive processes involved in psychological disorders has important implications for improving therapeutic interventions. For example, cognitive models of Panic Disorder (Clark, 1986) and OCD (Wells, 2000) have led to more refined treatments for these disorders. Greater understanding of the cognitive processes involved in GAD would have similar implications.

### **1.7.2 Aims of the investigation.**

The scarcity of instruments available to assess worry in children has significantly limited the development of experimental research into this area (Cartwright-Hatton, 2006). Within the adult population, the catastrophizing interview technique has been demonstrated to be a useful measure in experimental

research. However, differences in the cognitive, social and emotional development of children and adults mean that the validity of this technique with children cannot be assumed. To date, no research has explored the effectiveness of this measure with children.

This study aims to explore whether the catastrophizing interview technique can be used as an effective measure of worry with children. Should it be demonstrated to work well as a measure of childhood worry, this will offer researchers greater scope to develop a greater understanding of the processes involved in this phenomenon.

### **1.7.3 Research questions and hypotheses.**

Children differ from adults in terms of their cognitive, social and emotional development. Therefore, when adapting measures used with adults for the use with children, it is essential that these factors are considered and assessed in the process of validating their use as child measures. However, it is argued that, with the appropriate adaptations to account for these differences, the catastrophizing interview technique can be shown to be a valid measure of worry in children. As this measure has been demonstrated to be dynamic and sensitive to manipulation of worry levels, this would widen the scope for conducting experimental research into childhood worry. In order to further explore the use of this measure with children, a number of research questions and associated hypotheses are raised.

Research question 1: Can the catastrophizing interview technique be used as a measure of childhood worry?

Hypothesis 1: The number of steps generated in the catastrophizing interview will correlate with scores on the Penn State Worry Questionnaire for children (PSWQ-C).

Research question 2: Do children's differing levels of cognitive, emotional and social development interfere with the use of the catastrophizing interview technique as a measure of childhood worry?

Hypothesis 2: The relationship between the PSWQ-C and catastrophizing interview will remain significant when the effects of verbal fluency, verbal reasoning ability and social desirability are controlled for.

Research question 3: Can the catastrophizing interview technique be demonstrated to have good levels of alternate form reliability, increasing its usefulness as an experimental measure?

Hypothesis 3: The number of steps generated in the catastrophizing interview on first and second administration will correlate significantly for each participant.

Research Question 4a: Do different participants present with different styles of response to the catastrophizing interview task?

Research Question 4b: Do high and low worriers demonstrate different response styles?

Hypothesis 4: High and low worriers will present with different styles of catastrophizing interview response.

## **Methodology**

### **2.1 Chapter Overview**

This chapter will outline the methods used to explore the research hypotheses, and the rationale for these. In turn, the design, measures, participation, procedure and ethical considerations will be described and evaluated. Following this overview, Section 2.2 will address the design of the study, its rationale, and strengths and weaknesses. Section 2.3 will address issues of participation, including the inclusion and exclusion criteria, sample size and statistical power, and the recruitment of participants. Section 2.4 will outline the data collection methods used in this study, considering the reliability and validity of standardised measures and the construction of non-standardised measures. Section 2.5 will detail the procedure by which the research was carried out. Finally, Section 2.6 discusses the ethical issues that were considered in designing and implementing this research, and the steps that were taken to ensure ethical rigour and participant safety.

### **2.2 Design**

To explore the four research hypotheses, a multi-methodology design was employed. For the first three research questions it was possible to collect numerical data for all relevant variables; therefore a quantitative design was appropriate to address the research questions. This has the advantage of allowing the statistical significance of the results to be evaluated, which is an important factor in assessing the value of the catastrophizing interview technique with children. Research question four required both qualitative and quantitative analysis, allowing a richer exploration of the data.

For hypotheses one and two, a within-participant, correlational design was used to explore the relationship between number of steps generated on the catastrophizing interview with worry scores, verbal fluency, verbal reasoning and social desirability. For hypothesis one, the two variables under consideration were tendency to worry, as measured using the PSWQ-C (Chorpita et al., 1997), and the number of worry steps generated using the catastrophizing interview technique. As this was a correlational design, it is not possible to infer a causal relationship between these two variables. However, for the purpose of this study, in identifying whether the catastrophizing interview technique is a useful measure of worry in children, it is sufficient to identify a correlational, rather than causative, relationship between the two variables. It was predicted that a significant correlational relationship would be found between tendency to worry and number of steps generated using the catastrophizing interview technique, thus making it a useful measure of worry.

Assuming significant relationships were found between the main variables, hypothesis two required a multiple regression to explore the possible confounding effects of verbal fluency, verbal reasoning and tendency towards socially desirable answers. The prediction was that these factors would not significantly influence the relationship between the tendency to worry and number of steps generated using the catastrophizing interview technique. Due to the pragmatic nature of research, and limitations in the number of participants that could feasibly be recruited within the time frame available for this study, it was not possible to consider all the factors that could conceivably influence responses on the catastrophizing interview. However, by considering the areas of development most likely to impact on participant response to the catastrophizing interview, key social, emotional and cognitive

developmental factors were identified and addressed (see introduction for further discussion).

Hypothesis three, which addressed the alternate form reliability of the catastrophizing interview technique, was assessed using a within-participant repeated-measures design, to establish the strength of correlation between individual participant's scores on two separate catastrophizing interview scenarios. It was predicted that the number of steps generated would be consistent across the two worry scenarios, leading to a high correlation between scores and providing evidence for a good level of alternate form reliability of the measure.

To address hypothesis four, a secondary, between-participants analysis explored whether high worriers (those falling within the upper quartile of PSWQ-C scores) and low worriers (those falling within the lower quartile of PSWQ-C scores) differed in their response style on the catastrophizing interview. Initially, qualitative content analysis (Zhang & Wildemuth, 2009) was used in order to develop a coding frame for participant responses. This allowed the response styles to be categorized for quantitative content analysis (Neuendorf, 2002). It was predicted that high worriers and low worriers would differ in their response style, with high worriers being more likely to engage in extreme worry response styles.

## **2.3 Participants**

### **2.3.1 Participant population.**

Participants were recruited from a community sample of children aged 9 to 11 years old, attending Middle Schools within Bedfordshire. Vasey and Daleiden (1994) found that by the age of eight children have developed the cognitive abilities required to engage in worrying. When comparing children aged 8-9 and 10-11, they

found no significant differences in ability to identify or elaborate on worry themes. Therefore, for the purposes of this study, children of ages 9 to 11 can be considered a sufficiently homogeneous group.

### **2.3.2 Inclusion/exclusion criteria.**

Children were included in the study if they were aged between 9 and 11 years old. In order to participate in the study, participants were required to be fluent in English, and have sufficient sight and/or hearing to follow task instructions. Provided that participants meet the required level of English speech and sufficient verbal comprehension to allow them to participate, no other exclusions were made on the basis of physical or learning disability. As the study aimed to compare children with high and low levels of worry, participants were not excluded on the basis of the presence of a psychological disorder, although this was at the discretion of the participant, their parents/ guardians and the headteacher of their school. For all participants, distress levels were monitored throughout participation in order to ensure the safety of participants.

### **2.3.3 Sample size.**

The lack of research into childhood worry means that there were no existing studies on which sample size could appropriately be based. However, by making a number of assumptions, it is possible to estimate the required sample size for a study. The G\*Power programme was used to calculate the sample size needed in order to maximise the chance of detecting an effect (Faul, Erdfelder, Lang, & Buchner, 2007).

*Hypothesis 1.* To demonstrate a meaningful relationship between number of steps on the catastrophizing interview and the PSWQ-C, at least a medium effect size would be expected. For the correlational analysis, assuming a medium effect size ( $r = .3$ ), a one-tailed significance level of 0.05 and a power of 0.8, the minimum suggested sample size required for this hypothesis was 64.

*Hypothesis 2.* For multiple regression the number of participants is determined by the number of predictors which are included in the analysis. The four predictors in this study were PSWQ-C score, verbal fluency, verbal reasoning, and social desirability score. Assuming a medium effect size ( $r = .15$ ), a significance level of 0.05 and a power of 0.8, the study therefore required a sample of minimum 85 participants.

*Hypothesis 3.* To demonstrate alternate form reliability, at least a medium effect size would be assumed. Therefore, as in hypothesis 1, a minimum sample size of 64 was required.

*Hypothesis 4.* Assuming that the final coding includes four categories of response style, based on an effect size of 0.5, significance level of 0.05 and power of 0.8, a sample size of at least 44 participants was required for this analysis. As these participants will form the upper and lower quartiles of the complete sample, this translates to a total sample size of 88.

Based on these power calculations, a sample size of 88 was considered sufficient to conduct all analyses.

### **2.3.4 Recruitment.**

Participants were recruited from schools in Bedfordshire. Individual head teachers were contacted initially by letter, followed up within one week by telephone

and email. If they indicated a provisional interest in taking part in the study, a meeting was arranged with the researcher in order to discuss the full details of participation.

After gaining permission from the head teacher, information sheets and consent forms were sent via the school to parents of children aged 9 to 11 years old who met the inclusion criteria. A number of recruitment strategies were employed in order to encourage children and parents to find out about the study, for example flyers and presentations during assembly or registration periods, at the discretion of the school. As an incentive for participation, schools were offered £5 per participating child, in the form of book vouchers or a contribution towards other resources. Additionally, all participants were entered into a prize draw to win WH Smith vouchers, the values of which were between £5 and £20.

## **2.4 Measures**

### **2.4.1 Demographic questionnaire.**

Parents were asked to complete a demographic questionnaire for their child (Appendix A). This contained information regarding the child's age, gender and ethnic origin. Parents were sent this questionnaire along with information about the study and the consent form. This information was used to assess the suitability of the participant group in reflecting the wider population of school children within Bedfordshire.

#### **2.4.2 Penn State Worry Questionnaire for Children (PSWQ-C; Chorpita et al., 1997).**

The PSWQ-C is a 14-item self-report questionnaire that measures children's tendency to worry excessively. Items are scored on a 4-point Likert scale, from 0 (not at all true) to 3 (always true). Muris et al. (2001) assessed the validity of this measure in a sample of 486 8-12 year olds, and found that an 11-item short form of the measure (Appendix B) was preferable, and had good internal consistency (Cronbach's alpha = .89) and concurrent validity. The shorter version of this measure was therefore employed in this research. This generates a single score of tendency to worry, from 0 (low tendency to worry) to 33 (high tendency to worry).

#### **2.4.3 Wechsler Intelligence Scale for Children – Fourth UK Edition (WISC-IV-UK; Wechsler, 2004) – Similarities Subtest.**

The Similarities subtest is a test of verbal reasoning that can be used with children from the ages of 6 years to 16 years and 11 months. Children are presented with up to 23 sets of two words that represent common objects or concepts and asked to identify the common theme, generating a total score of up to 44. For example, participants were presented with the word pairing of "apple" and "banana" and would be expected to identify that these both belong to the category "fruit". The Similarities subtest has demonstrated an internal consistency reliability coefficient of .83 to .88 with children aged 9 to 11. It is a good measure of verbal IQ, with an intercorrelation of .89 with Verbal Comprehension Index composite scores (Wechsler, 2003). Therefore, for the purposes of this study, participants' scores on the Similarities subtest can be considered a reasonable estimate of their overall verbal development and ability. To allow comparison of participants' level of verbal

reasoning across the age range, raw scores rather than standard scores were used in the analysis (to prevent differences between the actual level of verbal ability of 9 and 11 year old participants being obscured).

#### **2.4.4. Test of verbal fluency – the ‘FAS’ test.**

The ‘FAS’ test is a well-established measure of verbal fluency, originating in the 1930s (e.g. Thurstone, 1938). Participants are given one minute per item, to name all of the words that they could generate beginning with the letters F, A, and S, and then name all the words they can belonging to the semantic category of ‘Animals’. The total composite score can be used as an estimate of verbal fluency, with higher numbers of words generated reflecting greater verbal fluency of participants. Variations of the test, using different phonetic and semantic categories, feature in a number of neuropsychological assessments such as the NEPSY (Korkman, Kirk & Kemp, 1998) and the Delis-Kaplan Executive Function System (D-KEFS; Delis, Kaplan & Kramer, 2001), and have been demonstrated to have good levels of alternate form reliability (e.g. Delis et al., 2001). This measure has proved a quick and simple way to estimate the verbal fluency of individuals, and is suitable for use with participants of this age-range, with norms available for participants from the age of 7 (e.g. Halperin, Healy, Zeitchik, Ludman & Weinstein, 1989; Riva, Nichelli & Devoti, 2000). The internal consistency of the measure has been demonstrated to be high ( $r = .83$ ; Tombaugh, Kozak & Rees, 1999), as is its inter-rater reliability ( $r = .96$  to  $.99$ ; Ross, 2003). Additionally, Riva et al. (2000) demonstrated that both phonemic and category fluency tasks relate to a single factor of verbal fluency.

Within this study, all four categories (phonemic categories of F, A and S, as well as the semantic category of “animals”) were administered to all participants.

However, due to concerns regarding the validity of the results for the phonemic categories, only participants' scores on the "animals" task were included in the final analysis (see section 4.7.2.2 for further discussion).

#### **2.4.5. Children's Social Desirability Scale (CSDS; Crandall, Crandall & Katkovsky, 1965).**

The CSDS is a 46-item measure of tendency to present oneself in a socially desirable manner. This involves children answering 'yes' or 'no' to a series of questions whereby there is a conflict between the most probable honest answer, and the socially desirable answer. For example, it would be anticipated that the honest answer for most children to the question "Sometimes do you do things you've been told not to do?" would be 'yes'; however, if children are concerned with providing a socially desirable response they are more likely to falsely answer 'no'. Crandall et al. demonstrated that the CSDS has demonstrated good internal consistency (Spearman-Brown corrected split-half reliabilities of .82 to .95), and good test-retest reliability (.85 to .90). Its validity was demonstrated based on correlation with relevant personality and behavioural factors.

Baxter et al. (2004) demonstrated that a 14-item version of the scale measured the same construct, and had similar levels of test-retest reliability. Therefore, the 14-item version of the CSDS will be used in this study (Appendix C). As this measure originates in the United States of America, minor amendments were made in order to increase its suitability for a U.K. sample. For example, on item two the phrase "pick up" was replaced with the common English usage of "tidy up". Similarly, on item fourteen, the word "mad" was replaced with the more common English word "angry". It is not anticipated that this should affect the meaning of the

measure, or impact on its use as a measure of tendency to give socially desirable answers.

This measure generates a total score between 0 and 14, indicating the participant's tendency to give socially desirable scores (with higher scores indicating an increased tendency to provide socially desirable rather than truthful answers). For the purposes of this research, this will be used as an estimation of the tendency of the participant to provide socially desirable answers within the research setting, and the likelihood of 'demand characteristics' of the participants.

#### **2.4.6. Emotional distress.**

In order to monitor the emotional effects of the catastrophizing interview technique on children, participants were asked to rate their levels of emotional distress at each step of the interview procedure, using a ten-point distress scale (Appendix D). Participants were required to rate their feelings of distress at each step of the interview, from 1 (not at all upset) to 10 (very upset). In order to provide visual prompts for participants in using the scale, a series of faces displaying the relevant level of emotion were used in conjunction with the numerical scale. It was anticipated that this would allow all children within the appropriate age-range to understand and use the rating scale.

Although this was not intended for use as a variable for statistical analysis, the distress scale will serve an important purpose in assessing the use of the catastrophizing interview with children. Firstly, from an ethical standpoint, it is important to ensure that participants do not become overly distressed whilst taking part in this research (see discussion within section 2.6.2). Secondly, should it prove the case that participants did find the catastrophizing interview a distressing

experience, this would create an argument for its unsuitability for use with children, despite any emerging evidence for reliability or validity of it as a measure.

#### **2.4.7 Catastrophizing interview technique.**

The technique used in this study will follow that of Startup and Davey (2001), which is adapted from the original technique designed by Vasey and Borkovec (1992). Vasey and Borkovec's original technique involved audio-taping a verbal interview. Participants would initially identify a worry topic, and were then asked "what is it about \_\_\_\_\_ (*the worry topic*) that worries you?" Following their response, the question "What about \_\_\_\_\_ (*participant's response*) would you find fearful or bad if it did actually happen?" with the participants response updated to reflect their latest answer. This technique was adapted by Startup and Davey (2001) in order to facilitate its use within a research environment. They required participants to write down their worry responses to a given scenario, keeping each response to one sentence. This prevents participants from giving detailed responses that may incorporate several steps in a catastrophizing sequence. In order to use this procedure with children, two adaptations were made to Startup and Davey's technique. Firstly, prior to commencing with the interview, children were given the opportunity to choose a cartoon character in order to represent them throughout the interview (see appendices E and F for worked examples of the interview technique). This was attached to the interview response sheet, on which the first of a series of thought bubbles was then attached. By providing these visual aids for participants, it was thought that participants would be better able to engage in the task, and would experience the interview as more child-friendly and less interrogatory than the original, adult, interview technique. Participants were also given the choice between

writing their own responses and dictating them to the researcher, to allow for differing levels of academic ability.

In order to ensure that participants understood the purpose of the interview, they were firstly introduced to the technique using a gender-specific example scenario, whereby they were asked to identify three consecutive worries for a fictional character, who is worried about his or her first day of school. In the case that participants were unable to identify any worries, they were prompted with feasible examples of what the individual could be worrying about. Following this, two scenarios, based on common childhood worries (Silverman et al., 1995), were presented, and participants asked to write (or dictate) their worry responses into the thought bubbles provided. The first scenario required participants to imagine that they were due to give a 5-minute talk to their class, and to identify what might worry them about this situation. The second scenario involved generating worries relating to taking a maths test.

Previous research has found that it is not required for participants to have personally experienced the specific worry scenario for the catastrophizing interview to be effective. Davey and Levy (1998) asked adult participants to imagine that they were the Statue of Liberty, and to generate worries in response to this scenario. They found that worriers would generate a longer catastrophizing sequence than non-worriers, despite it not being an existing personal worry. By using generalised, high frequency yet low intensity worries, it was hoped that the personal distress of participants could be kept to a minimum, whilst the scenarios used would be sufficiently familiar for participants to be able to engage in the task required.

## 2.5 Procedure

Following receipt of written consent from prospective participants' parents or guardians, participants were invited to an individual research interview at their school, during their normal school hours. Participation took place within a private room on school property. Each participant was presented with the participant information sheet (which had previously been sent to their home together with the parents information sheet), and was invited to ask any questions or request clarification. The main points of the information sheet were summarised by the researcher, and if the participant was willing to proceed, written assent was requested.

Participants were then asked to complete the PSWQ-C, which was read aloud to them by the researcher. This was followed by completion of the FAS test, Similarities subtest, and CSDS.

Following this, participants were presented with the practice item for the catastrophizing interview. Firstly, they were shown a picture of a cartoon character, named Joe (for male participants; see appendix G) or Polly (for female participants; see appendix H), with three thought bubbles attached. They were introduced to the following scenario:

*This is Joe/ Polly [specific to the gender of the child]. We are going to imagine that it is Joe 's/ Polly's first day of school, and he/ she is feeling worried. I want you to imagine what Joe/ Polly might be worried about. Each time that you think of a worry, I will ask you another question about that worry, and we'll write it down in these thought bubbles. Just try to think of what you think Joe/ Polly might be worrying about. Just give it a go and let*

*me know if you get stuck or don't understand. So, the first question is, what might be worrying Joe/ Polly about going to school for the first time?*

If the participant was able to identify an appropriate worry, this was written in the first thought bubble, and was used to frame the second question:

*That's great, that's a very good worry. I'll write it in this bubble. Now, the next question is, 'what might Joe/ Polly be worrying about [worry generated by child]?'*

This was repeated until three consecutive worries had been elicited. Should participants be unable to identify a worry for the character, these were offered by the researcher, as follows:

*Perhaps Joe/ Polly is worried that he/she won't make any friends. Does that sound like the kind of worry that someone starting a new school might have? OK, we'll write that in the first thought bubble – 'What if I don't make any friends?' So, the next question is, what might be worrying Joe/ Polly about not making any friends?*

If the participant was unable to identify an appropriate worry, the researcher suggested the following:

*Perhaps one thing that might worry Joe/ Polly about not making any friends is that he/ she will not have anyone to play with at break-time. Does that sound right? OK, let's write that in the second thought bubble. Now, the next question is, what might be worrying Joe/ Polly about not having anyone to play with at break-time?*

Again, if the participant was unable to respond, the researcher suggested a final worry:

*Perhaps one thing that might worry Joe/ Polly about not having anyone to play with at break-time is that he/ she will feel lonely. Does that sound right?*

*Ok, let's write that in the third thought bubble.*

Regardless of whether the participant was able to identify worries, they would then be invited to commence the catastrophizing interview. This began with participants selecting a cartoon image to present them, from a selection offered by the researcher. This was attached to the response sheet, with the first thought bubble and distress rating attached above it. Participants were then given the first of two worry scenarios, and asked to generate worries in response to it:

*Imagine that your teacher tells you that you have to give a five-minute talk to the rest of your class. Imagine that you are feeling very worried about giving the talk. What could be worrying you about giving the talk?*

At each step of the catastrophizing interview, subject levels of distress were elicited from the participant using the distress scale. Each worry was then used to construct the following question, in the format of:

*"What might worry you about [previous worry generated by child]?"*

Following the procedure of Vasey and Borkovec (1992) the interview was terminated when the participant reached one of three conclusions: firstly, if they indicated that they wished to end the interview; secondly, if they were unable to generate a response; or thirdly, if they repeated the same general response three times. Additionally, if the participant recorded a distress rating of seven or above, or became visibly distressed, they were given the option to end the interview.

The procedure was the repeated with the second scenario:

*Imagine that you are about to take a maths test. Imagine that you are feeling very worried about taking the test. What could be worrying you about taking the maths test?*

Following this, participants were congratulated for taking part in the research, and any final questions were answered or concerns addressed.

## **2.6 Ethical Considerations**

Ethical rigour is essential when conducting research with child participants. Using the British Psychological Society's ethical guidelines (BPS, 2009), a number of ethical issues were addressed in the construction of this study.

### **2.6.1 Informed consent.**

BPS (2009) guidelines state that, in the case of child participants, sufficient information must be provided to allow the participant to provide consent "to the extent that their capabilities allow" (p. 12). In order to ensure this, participants were provided with a written information sheet (Appendix I), written in simple language that it was anticipated that children aged 9 to 11 would understand. This was provided at least one week prior to participation, for children to read through and discuss with their parents. The information sheet was presented again immediately prior to participation to be read through with the researcher, at which point any final questions could be answered. Only at this stage was written participant assent collected (see Appendix J).

Prior to giving consent for their child to partake in the study, parents (or legal guardians) were provided with an information sheet describing the aims and procedures of the research, and were encouraged to contact the researcher for

clarification or to ask questions (see Appendix K for information sheet). As this study did not require any aspects of deception in order to be effective, it was possible to fully disclose the aims and procedures of the research to parents and children, prior to written consent being sought. Parents were asked to sign a consent form if they were prepared for their child to take part in the research (Appendix L). Only those children for whom consent has been granted by their parents or guardians were able to participate.

It was made clear to both parents and children that they could withdraw from the research at any point. Additionally, children were informed at the time of participation that they could choose not to participate, despite their parent or guardian having given consent.

### **2.6.2 Participant safety and distress.**

It was not anticipated that participating in the research would create a greater risk of harm or distress than participants' normal daily lives. To ensure this, the worry scenarios chosen for use with the catastrophizing interview were carefully chosen to reflect common situations that would be familiar to children of the appropriate age group. As high frequency, but relatively low intensity worries (Silverman et al., 1995) were used for the interview scenarios, it was therefore anticipated that levels of distress would be low. In order to further minimise the potential causes of distress for participants, a number of strategies were employed. Throughout the catastrophizing interview, participants were asked to rate their levels of distress at each step of the interview. This allowed the researcher to ensure that participants were not becoming distressed whilst discussing their worries. Should participants begin to demonstrate high levels of distress (rating their distress at seven

or above on the scale), they were given a range of options – to have a break, discuss the reasons for the distress, or to end the interview. Should participants display any form of distress at other any times during participation (for example, whilst completing any other measures), the task was immediately discontinued, and reasons for the distress were explored and contained. At the end of participation, children were fully debriefed, and any concerns addressed.

Any incidents of distress were reported to the child's teacher. If scores on the questionnaires indicated that a child was experiencing unusually high levels of worry, this was discussed with the school's Special Educational Needs Co-ordinator or the member of staff responsible for monitoring the social and emotional well-being of pupils. If no current plans were in place in order to manage the child's psychological distress it was agreed that their parents or carers would be informed and it was recommended that the child's GP was informed. Using the normative data provided by Muris et al. (2001), unusually high levels of worry were determined by PSWQ-C scores greater than two standard deviations above the mean (translating to a score of 21 or above for male participants and 22 or above for female participants).

### **2.6.3 Confidentiality.**

All data were managed in accordance with the Data Protection Act. Raw data, including questionnaires, were kept in a locked cupboard at the University of East Anglia (UEA). Unique identification numbers were used to identify participants. Personally identifying data were not stored, with the exception of written consent and assent forms. These were stored separately to the research data, also within a locked cupboard on UEA premises. Schools, parents and children were informed that their identity would not be revealed in any research outputs.

#### **2.6.4 Ethical review.**

In order to ensure the safety of participants and the ethical rigour of the study, a full research proposal was presented for review by the UEA's Faculty of Health Research Ethics Committee. It is the remit of this committee to ensure that all research conducted within university's health departments meets sufficient ethical and legal standards. Following minor amendments to the original research proposal, this research was approved by the committee (see Appendix M).

## **3 Results**

### **3.1 Overview**

The chapter comprises seven sections, which outline the key features of the data and its analysis. Following this overview, section 3.2 explores the participants' demographic data. Section 3.3 reports the descriptive analysis of the main variables. Section 3.4 assesses the normality of the data, and the suitability of the selected statistical tests. Section 3.5 goes on to detail the quantitative analysis relating to research questions one to three. Section 3.6 discusses the qualitative and quantitative content analysis required to address research question four. Finally, section 3.7 presents a summary of the results.

### **3.2 Descriptive Analysis of Participants' Demographic Data**

Participants were recruited from three Bedfordshire middle schools, one of which was within a town and two of which were village schools. Approximately 380 information packs were provided to children from 14 classes (12 Year Five classes, 2 Year Six classes). Ninety-one individuals returned completed parental consent forms. Three were unable to take part in the study; two due to insufficient English-language skills to complete the tasks, and one due to absence from school. Therefore, a total of 88 participants took part in the study. Twenty-five participants were 9 years old, fifty-nine were 10 years old, and four were 11 years old ( $M = 9.76$ ,  $SD = .53$ ). See Table 1 for the gender and ethnic origin of the participant group.

TABLE 1  
*Participant Gender and Ethnicity*

Ethnicity	Gender	
	Male	Female
White British	35	42
White other	1	1
Mixed White-Caribbean	0	3
Mixed White-Asian	0	1
Caribbean	1	0
African	1	0
Indian	1	1
Declined to respond	0	1

### 3.3 Descriptive Analyses of the Study's Main Variables

Within this section, the descriptive analyses of the main variables (Penn State Worry Questionnaire for Children, catastrophizing interview tasks, verbal reasoning task, verbal fluency measures, and Children's Social Desirability Scale) are outlined. Table 2 shows the mean scores, standard deviations, minimum and maximum achieved scores for each variable.

TABLE 2  
*Descriptive Statistics for the Study's Main Variables*

Scale/Subscale	Mean	Standard Deviation	Minimum	Maximum
FAS – total	42.90	10.25	24	67
FAS – Letters	25.43	8.26	12	48
FAS – Animals	17.47	4.27	7	28
Similarities	20.94	4.52	10	30
CSDS	3.67	2.79	0	14
PSWQ-C	15.03	6.28	2	33
Interview – total	14.95	7.27	4	22
Interview 1	7.84	4.31	1	22
Interview 2	7.09	4.56	0	40

Key for variables: FAS = Verbal Fluency task, FAS Letters = total score derived on F, A, and S letter tasks; FAS Animals = total score on categorical task. Similarities = Similarities Subtest of WISC-IV. CSDS = the Children's Social Desirability Scale. PSWQ-C = Penn State Worry Questionnaire for Children. Interview total = sum of number of steps for both catastrophizing interview tasks; Interview 1 = public speaking scenario; Interview 2 = maths test scenario.

### 3.3.1 Penn-State Worry Questionnaire for Children (PSWQ-C).

Participants reported a mean PSWQ-C score of 15.03, with no significant difference detected in mean scores regarding gender,  $t = 1.036, p = .303$ . A correlational analysis of age (in months) and PSWQ-C scores revealed no significant correlation,  $r = -.161, p = .139$ . The relationship between ethnicity and the PSWQ-C was not explored, as the majority of participants belonged in one ethnic group.

### **3.3.2 Verbal fluency – the FAS test.**

The four components of the FAS test (Letters F, A, S, and Animals) were analysed to assess the internal consistency of the measure. This produced a Cronbach's alpha score of .696, marginally below the recommended lower limit of .7 for reliability (Bech et al., 1993). As there was concern regarding the validity of some of the components of the test due to a number of relevant words being present in the test room on some administrations of the test (see discussion for methodological issues), it was decided that only the Animal subsection of the FAS test would be used for the analysis.

No significant difference in mean score was detected for male and female participants on the Animal subtest,  $t = 1.686$ ,  $p = .095$ . A correlational analysis of age (in months) and FAS Animal scores revealed no significant correlation,  $r = -.022$ ,  $p = .839$ .

### **3.3.3 Verbal reasoning – Similarities subtest.**

No significant difference in mean score was detected for male and female participants on the Similarities subtest of the WISC-IV,  $t = .415$ ,  $p = .679$ . A correlational analysis of age (in months) and subtest scores also revealed no significant correlation,  $r = .052$ ,  $p = .634$ .

### **3.3.4 The Children's Social Desirability Scale (CSDS).**

The Children's Social Desirability Scale was used as a measure of participants' likelihood of providing responses in order to please the researcher, as opposed to according to their genuine reactions. No significant difference in mean score for male and female participants on the CSDS,  $t = .241$ ,  $p = .810$ . A

correlational analysis of age (in months) and CSDS scores also revealed no significant correlation,  $r = -.047$ ,  $p = .669$ .

### **3.3.5 Catastrophizing interview tasks.**

All children were able to provide three worry steps for the practice task. All participants were also able to provide at least one worry for the initial scenario, although three failed to provide any worries for the second (maths test) scenario. In order to statistically analyse the results of the interview tasks, scores were derived based on the number of individual worry steps the participants provided for each interview scenario. Additionally, the total number of steps generated by each participant (the sum of their responses to interview scenarios one and two) was calculated and analysed.

Analysis regarding the relationship between age, gender and the task are detailed in Section 3.5.5, as these relate to the main research questions regarding the validity of the task as a measure of worry in children.

### **3.3.6 Summary of the main variables.**

To summarise, no significant differences were found on the study's main variables relating to age or gender. The relationship between the variables and ethnicity was not explored, as the vast majority of participants identified themselves as belonging to a single ethnic group.

## **3.4 Assumptions of Parametric Statistical Tests**

In order to correctly use parametric statistical tests, a number of assumptions must be met. These include normally distributed data, homogeneity of variance and

independence of the data (Field, 2009). Additionally, all data must be measured at the interval level or above. This section addresses these concerns before concluding with an evaluation of the appropriate statistical tests required for the analyses.

### **3.4.1 Normality of data.**

Each variable was tested for its normality of distribution, and corrective transformations were considered where appropriate. The normality of distribution was assessed both visually (see appendix N for histograms) and using the Kolmogorov-Smirnov D. Data are considered non-normally distributed if the Kolmogorov-Smirnov score reaches a significance level of  $p = .05$  or below.

Additionally, the level of skew and kurtosis was considered for each variable. The significance level of skew and kurtosis was calculated using z-scores. The following formulas were applied (Tabachnick & Fidell, 2007):

$$Z (\text{kurtosis}) = K (\text{kurtosis}) / S_k (\text{standard error of kurtosis})$$

$$Z (\text{skew}) = S (\text{skewness}) / S_s (\text{standard error of skew})$$

Z-scores for skew and kurtosis exceeding +/- 1.96 were considered significant to the .05 level.

#### ***3.4.1.1 Catastrophizing interview task.***

The number of steps generated using the catastrophizing interview tasks were found to be non-normally distributed, for both interviews and the combined number of steps (interview 1,  $D = .123$ ,  $p = .002$ ; interview 2,  $D = .154$ ,  $p < .001$ ; total score,  $D = .123$ ,  $p = .002$ ). Additionally these data were found to be significantly skewed (interview 1,  $z = 3.11$ ,  $p = .001$ ; interview 2,  $z = 3.04$ ,  $p = .001$ ; total score  $z = 4.48$ ,

$p < .001$ ), and the total score also showed a significant level of kurtosis ( $z = 3.57$ ,  $p < .001$ ).

#### **3.4.1.2 CSDS.**

The CSDS was also found to be non-normally distributed (Kolmogorov-Smirnov  $D = .152$ ,  $p < .001$ ), with significant levels of skew ( $z = 3.55$ ,  $p < .001$ ) and kurtosis ( $z = 2.34$ ,  $p < .01$ ).

#### **3.4.1.3 Similarities.**

The Similarities subtest was found to be non-normally distributed (Kolmogorov-Smirnov  $D = .107$ ,  $p = .014$ ), although the data did not demonstrate any significant level of skew or kurtosis.

#### **3.4.1.4 FAS test – Animals.**

The Animal subsection of the FAS test was found not to differ significantly from the expected distribution, with no significant level of skew or kurtosis.

#### **3.4.1.5 PSWQ-C.**

The PSWQ-C was also found not to differ significantly from the expected distribution.

#### **3.4.1.6 Corrective transformations.**

Following square root transformations of both the catastrophizing interview task scores and the CSDS, normal distributions were achieved (see appendix O for histograms and box plots of transformed data). As transforming the data did not

significantly improve the distribution of the similarities subtest, it was decided that the original data would be included in the analysis.

### **3.4.2 Homogeneity of variance.**

As hypothesis four involved the comparison of ‘High worry’ and ‘Low worry’ groups of participants, it is necessary to assess the homogeneity of variance between the two groups. This was assessed using Levene’s Test. Variances were found to be equal for the two groups on the FAS Animal subtest,  $F(1,47) = .10, ns$ ; CSDS,  $F(1,47) = .61, ns$ ; and the catastrophizing interview tasks (task 1,  $F(1,47) = .61, ns$ ; task 2,  $F(1,47) = .04, ns$ ; total of both tasks,  $F(1,47) = .56, ns$ ). The variance on the Similarities subtest,  $F(1,47) = 4.36, p < .05$  and the PSWQ-C,  $F(1,47) = 4.48, p < .05$ , were significantly different for the two groups. However, given the relatively large sample size of the groups, significant results are more likely to occur (Field, 2009), so should be interpreted with caution.

### **3.4.3 Independence.**

As this study employed a between-participants design, it is expected that data from individual participants will be independent, thus fulfilling this requirement of parametric statistical tests.

### **3.4.4 Level of data.**

All main variables (catastrophizing interview scores, PSWQ-C, CSDS, Similarities subtest and FAS test) were measured at a minimum of the interval level of data, thus fulfilling the final parametric assumption.

### **3.4.5 Appropriateness of parametric statistical tests.**

Following corrective transformations on a number of variables, it was concluded that it would be appropriate to use parametric statistical tests for the analysis of the data, as the assumptions of parametric tests were met to a sufficient standard.

### **3.4.6 Outliers.**

Outliers were defined as any value considered extreme using the SPSS box plot procedure (see Appendix P). Outliers were identified for the CSDS, PSWQ-C, and catastrophizing interview tasks. No extreme outliers (values above three interquartile ranges from the outer edge of the box) were present. For all variables with outliers present the mean and 5% trimmed means were compared to assess the impact of the outliers on the overall data. In no cases were the outliers found to have a marked effect on the difference between the two means, therefore no cases were removed from the analysis.

### **3.4.7 Missing data.**

As the majority of information was gathered through interviews with the researcher, no data were missing from any of the main variables. Missing data relating to date of birth ( $n = 2$ ) and ethnicity ( $n = 1$ ) did not affect any of the statistical analyses.

### **3.4.8 Summary.**

Following corrective transformations, the assumptions of parametric statistical tests were met to a sufficient standard to allow their use. The use of

interval level data, with largely normally distributed samples, independent variables, and homogeneity of variance between groups, plus the absence of extreme outliers or missing data, allow the relevant statistical tests to be used with confidence.

### **3.5 Quantitative Analysis relating to Research Questions One to Three.**

#### **3.5.1 Research question one.**

Does the catastrophizing interview task demonstrate concurrent validity when compared to an existing measure of worry in children?

Hypothesis 1: The number of steps generated in the catastrophizing interview will correlate with scores on the Penn State Worry Questionnaire for children (PSWQ-C).

It was hypothesised that participants with a greater tendency to worry (and therefore higher PSWQ-C scores) would generate more steps in response to the catastrophizing interview. Consequently there would be a positive correlation between PSWQ-C scores and scores on the catastrophizing interview tasks. As this hypothesis predicted directionality, a one-tailed Pearson's correlation was used. Table 3 presents the correlation coefficients obtained in this analysis. PSWQ-C scores were compared with the number of steps generated by participants on interview scenario one, the number of steps generated by participants on interview scenario two, and the total number of steps when these two scores were added together. These results show no significant correlation between the PSWQ-C scores and catastrophizing interviews.

Table 3  
*Correlation Coefficients for Research Question One*

Scale/Subscale	PSWQ-C ( <i>R</i> )	<i>p</i> -value
Interview 1	.122	.128 (1-tailed)
Interview 2	.146	.087 (1-tailed)
Interview – total	.173	.053 (1-tailed)

### 3.5.2 Research question two.

Is the relationship between the catastrophizing interview task and worry affected by children’s cognitive and social development?

Hypothesis 2: The relationship between the catastrophizing interview and PSWQ-C will remain significant when the effects of verbal fluency, verbal reasoning ability and social desirability of response are controlled for.

Although Research Question One found no significant relationship between the catastrophizing interview task and the PSWQ-C, it was possible that controlling for the effects of verbal fluency, verbal reasoning and social desirability of response would increase the significance of the relationship between the two worry measures. In order to conduct a multiple regression, individual correlations between the independent and dependent variables should ideally be a minimum of .3 (Pallant, 2007). As this was not the case (see table 4 for correlation matrix), a multiple regression analysis was not conducted. Instead, the partial correlations between variables were considered.

Table 4  
*Correlation Matrix for Main Variables*

Variable	FAS Animal	Similarities	CSDS	PSWQ-C	Interview 1	Interview 2
FAS Animal						
Similarities	.287**					
CSDS	-.170	-.160				
PSWQ-C	-.137	.103	-.161			
Interview 1	.360**	.247**	-.147	.122		
Interview 2	.093	.130	.030	.146	.255**	
Interview total	.296**	.232*	-.088	.173	.802**	.764**

Note. \* $p < .05$ . \*\* $p < .01$  (1-tailed).

In this analysis it was found that although the relationships between the PSWQ-C and the two individual administrations of the catastrophizing interview task remained at a non-significant level (interview 1  $r = .155$ ,  $p = .078$ ; interview 2  $r = .160$ ,  $p = .071$ ) the total catastrophizing interview score was now found to correlate significantly with the PSWQ-C ( $r = .206$ ,  $p < .05$ ). However, the extent of the correlation remains low.

### ***3.5.2.1 Relationship between catastrophizing interview steps and other main variables.***

The analysis of the relationship between the catastrophizing interview and the PSWQ-C produced mixed results, with only the partial correlation of the participants' total score on the two interview tasks demonstrating a significant relationship with the PSWQ-C scores. Consequently, the relationships between the interview total score and other key variables were explored to determine whether the

number of steps generated using the interview technique was in fact more highly associated with verbal fluency, verbal reasoning, or tendency to provide socially desirable responses than with worry.

*3.5.2.1.1 Catastrophizing interview and verbal fluency.* A significant correlation was detected between the FAS Animals subtest and one of the two interview administrations (interview 1  $r = .360$ ,  $p < .001$ ; interview 2  $r = .093$ ,  $p = .194$ ) and with the total interview score ( $r = .296$ ,  $p < .005$ ).

*3.5.2.1.2 Catastrophizing interview and verbal reasoning.* A significant correlation was also present between the Similarities subtest and one of the two interview administrations (interview 1  $r = .247$ ,  $p = .01$ ; interview 2  $r = .130$ ,  $p = .114$ ) and with the total interview score ( $r = .232$ ,  $p < .05$ ).

*3.5.2.1.3 Catastrophizing interview and social desirability.* No significant correlations were present between the Children's Social Desirability Scale and any presentations of the interview (interview 1  $r = -.147$ ,  $p = .087$ ; interview 2  $r = .030$ ,  $p = .391$ ; total interview score  $r = -.088$ ,  $p = .208$ ).

### **3.5.3 Summary of research questions one and two.**

To summarise, this analysis found limited support for the relationship between the catastrophizing interview tasks and the PSWQ-C. The analysis relating to hypothesis one failed to detect a significant relationship between the two variables, whereas the partial correlation conducted for hypothesis two found that the total number of steps generated by each participant on the two interview tasks did

significantly correlate with the PSWQ-C, once the confounding effects of verbal ability and social desirability of responses were controlled. When exploring the relationship between the catastrophizing interview tasks and the other main variables, no significant relationships were found between the CSDS and any of the interview task scores, or between the second administration of the interview and any of the variables. Measures of verbal reasoning and verbal fluency were found to correlate with both the first administration of the catastrophizing interview and with the interview total score. However, in all cases, the extent of the correlation between variables was low.

#### **3.5.4 Research question three.**

Can the catastrophizing interview technique be demonstrated to have good levels of alternate form reliability, increasing its usefulness as an experimental measure?

Hypothesis 3: The number of steps generated in the catastrophizing interview on first and second administration will correlate significantly for each participant.

It was hypothesised that the number of steps generated on the two administrations of the interview would be positively correlated. A one-tailed Pearson's correlation was used to test this relationship, as the predicted directionality of the relationship was known. This found that the two administrations of the interview did correlate to a significant level ( $r = .255, p < .01$ ). As this analysis related to two measures of the same underlying construct, the strength of the intraclass correlation was also assessed. This provided an intraclass correlation coefficient of  $r = .251, p < .01$ . However, the strength of these correlations are low,

as the correlation coefficient values demonstrate that the relationship between the two administrations of the interview fails to account for the majority of the variation in interview score. Consequently, the two administrations of the interview did not demonstrate a sufficient level of alternate form reliability, and the hypothesis was not supported.

### **3.5.5 Additional analysis: Demographic data and catastrophizing interview.**

Using a t-test, the relationship between gender and the catastrophizing interview was assessed. A significant gender difference between number of steps generated on the catastrophizing interview was found on one of the two interview administrations (interview 1  $t = 3.262$ ,  $p < .005$ ; interview 2  $t = 1.851$ ,  $p = .068$ ) and with the total interview score ( $t = 3.089$ ,  $p < .005$ ), with female participants generating more interview steps than male participants in both cases.

No significant relationship was found between age (in months) and the number of steps generated on the catastrophizing interview (interview 1  $r = -.136$ ,  $p = .212$ ; interview 2  $r = -.015$ ,  $p = .892$ , total score  $r = -.094$ ,  $p = .388$ ).

The relationship between ethnicity and catastrophizing interview score was not assessed, as the majority of participants belonged to the same ethnic group.

## **3.6 Mixed-Methodology Analysis Relating to Research Question Four**

Research Question 4a: Do different participants present with different styles of response to the catastrophizing interview task?

Research Question 4b: Do high and low worriers demonstrate different response styles?

Hypothesis 4: High and low worriers will present with different styles of catastrophizing interview response.

### **3.6.1 Analysis.**

A mixed-methodology content analysis was required in order to explore differences between the response styles of high and low worriers. Following the initial qualitative content analysis, quantitative content analysis was used to statistically address hypothesis 4. Qualitative content analysis has been defined as:

“a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” (Hsieh & Shannon, 2005, p.1278).

Content analysis involves a number of steps, including identifying the relevant sample, defining the unit of analysis, developing categories and a coding scheme, testing the coding scheme against a sample of text, coding the whole text, and assessing the consistency of the analysis (Zhang & Wildemuth, 2009). The resultant coding scheme can then be used for either qualitative or quantitative analysis of the data.

### **3.6.2 Qualitative content analysis.**

Research Question 4a: Do participants present with different styles of response to the catastrophizing interview task?

Qualitative analysis allows a richer analysis of participants' experience than quantitative analysis alone. Qualitative analysis is an umbrella term encompassing myriad methods of analysis, which allow for a greater or lesser grounding in the

participants own understanding of their experience. For the purposes of this study, a qualitative content analysis was carried out in order to identify the themes and categories of worry response generated by participants, which then allowed a quantitative content analysis of the response styles to be conducted.

### **3.6.3 Sampling.**

To address the research questions, a sample of “high” and “low” worriers was required. Accordingly, participants were grouped according to their score on the Penn State Worry Questionnaire for children. Participants whose PSWQ-C scores fell within the lowest quartile were assigned to the Low Worry group (PSWQ-C of ten or below), and participants whose PSWQ-C scores fell within the upper quartile were assigned to the High Worry group (PSWQ-C of 19 or above). As a number of participants had scores on the cut-off points for both quartiles, the two groups comprised 56% of the total sample ( $n = 24$  for the Low Worry group;  $n = 25$  for the High Worry group).

The two groups were compared for differences in age, gender, ethnicity, verbal fluency scores, Similarities scores and CSDS scores. No significant differences were found between the two groups. See Table 5 for data.

Table 5  
*Descriptive Statistics for High and Low Worry Groups*

Gender	Worry group	
	Low ( <i>n</i> )	High ( <i>n</i> )
Female	12	16
Male	12	9
	Low ( <i>M</i> )	High ( <i>M</i> )
Age	9.83	9.76
FAS – total	42.96	42.32
FAS – Letters	25.46	26.48
FAS – Animals	18.00	16.24
Similarities	19.67	21.60
CSDS	4.25	3.36
PSWQ-C	7.54	22.64
Interview – total	12.58	15.80
Interview 1	6.29	8.12
Interview 2	6.21	7.68

*Note:* (*n*) = number of participants; (*M*) = Mean scores. Key for variables: FAS = Verbal Fluency task, FAS Letters = total score derived on F, A, and S letter tasks; FAS Animals = total score on categorical task. Similarities = Similarities Subtest of WISC-IV, CSDS = the Children’s Social Desirability Scale, PSWQ-C = Penn State Worry Questionnaire for Children. Interview total = sum of number of steps for both catastrophizing interview tasks; Interview 1 = public speaking scenario; Interview 2 = maths test scenario.

### **3.6.4 Defining units of analysis.**

Qualitative content analysis can take place at the level of individual words, themes or items (Zhang & Wildemuth, 2009). In order to analyse the types of response given by participants to the worry scenarios, it was most appropriate to analyse the data at the thematic level.

### **3.6.5 Developing categories and a coding scheme.**

Categories and coding schemes can originate from the data, previous studies, and relevant theories (Zhang & Wildemuth, 2009). As the catastrophizing interview technique has rarely been used with children, or studied qualitatively with adult participants, there is limited evidence on which the initial categories and coding scheme could be based. Although not explicitly investigating response style, Provencher et al. (2000) found that adult worriers were more likely to generate more serious outcomes when using the catastrophizing interview, even if they did not generate more steps. Therefore, it is possible that children may also differ regarding how extreme the outcomes they reach when provided with a worry scenario. In the process of her research, Turner (2010, unpublished) observed that some participants would rapidly reach extreme conclusions during their worry bouts, whilst others would be drawn into circular loops of worry response. These repetitive, circular worry bouts may be indicative of the ‘ruminative’ worry style identified by Szabo and Lovibond (2004).

Based on these indications, it was hypothesised that a number of different ‘styles’ of response would be found, irrespective of number of steps generated using the interview. Accordingly, several categories were included in the initial analysis of the data. It was predicted that response styles would include ‘extreme’ responses,

whereby the participant would very quickly reach unrealistically catastrophic outcomes of the scenario, and 'circular' responses in which the participants would repeat the same sequence of worries indefinitely, as well as more typical linear chains of response. With these categories in mind, the written responses provided by participants within the High and Low Worry groups were analysed for theme. As three interviews had generated no response, this resulted in a total of 95 interviews being analysed.

As the data were analysed, an initial coding scheme was constructed, through a process of 'open coding' (King, 2008). Following reflection and discussion with an independent researcher, some initial codes were modified or collapsed, until a final coding scheme which was sufficient to incorporate all the data was produced. Production of the final coding scheme was a recursive process, whereby the researcher continuously referred back to the data in order to ensure saturation was reached.

### **3.6.6 Assessing the consistency of the coding.**

When conducting qualitative analysis, it is essential that checks are conducted in order to ensure that the data analysis is not distorted by the preconceived ideas and assumptions of the researcher (King, 2008). Accordingly, a randomly selected sample of 20 interviews was reassessed by an independent researcher. The independent researcher was provided with the coding frame and full written responses of the participants, and was unaware of the code allocated by the primary researcher to each interview response. This resulted in perfect inter-rater agreement between the two researchers.

### 3.6.7 Coding scheme.

A final, hierarchical coding scheme was produced in accordance with the data (see Figure 8). As predicted, some participants demonstrated clearly recursive loops of worries, labelled as a ‘circular’ response style. Participants also differed in how extreme their responses were given the interview scenarios, and whether their outcomes were focused on the short-term future or longer-term outcomes of the given scenario.

- |  |
|--|
| <p><b>1 Short-term</b> (<i>Responses focusing solely on immediate or near-future implications</i>)</p> <ul style="list-style-type: none"><li>1.1 Social/ peer reaction (<i>Immediate responses of peers and friendship group; short-term implications for social activities</i>)</li><li>1.2 Parental reaction (<i>Immediate or near future responses of parents and/or carers</i>)</li><li>1.3 Academic/ school’s reaction (<i>Immediate or near future implications for school-based activities; immediate reactions of teachers or other school staff</i>)</li><li>1.4 Personal reaction (<i>immediate or short-term impact on participant’s internal world – emotions, thoughts and physical responses</i>)</li></ul> <p><b>2 Extreme</b> (<i>outcomes which are likely to significantly impact on the participant’s life – e.g. expulsion, moving schools, permanent loss of friends, serious injury/illness, death</i>)</p> <p><b>3 Circular</b> (<i>responses of any type that form a repetitive loop of consequences</i>)</p> <p><b>4 Long-term</b> (<i>Outcomes more than one year in the future</i>)</p> <ul style="list-style-type: none"><li>4.1 Academic achievement (<i>Impact on examination results, university, etc</i>)</li><li>4.2 Career (<i>Future employment</i>)</li><li>4.3 Health and mortality (<i>Impact on health as an adult, death</i>)</li><li>4.4 Social relationships (<i>Impact on adult relationships with friends and family; marriage and children</i>)</li><li>4.5 Finance and housing (<i>Impact on future finances and wages, adult spending power, desirability of housing, homelessness</i>)</li></ul> |
|--|

Figure 1. Final Coding Scheme.

### 3.6.8 Response styles.

The final coding scheme consisted of four primary response styles (standard, extreme, circular and long-term) and a number of sub-styles. It was noted that,

regardless of response style, participants typically began in a consistent manner, with a limited number of short-term, realistic worries.

### ***3.6.8.1 Initial responses.***

Examples of the initial worry step provided by participants for the two given scenarios are detailed below:

Scenario one: “Imagine that your teacher tells you that you have to give a five-minute talk to the rest of your class. Imagine that you are feeling very worried about giving the talk. What could be worrying you about giving the talk?”

- “I might get the words wrong” P22 (Participant number 22)
- “Forgetting what to say” P23
- “People laughing” P28
- “People could make fun of you” P65
- “I’d get stage-fright” P57

Scenario two: “Imagine that you are about to take a maths test. Imagine that you are feeling very worried about taking the test. What could be worrying you about taking the maths test?”

- “If I get lots of questions wrong” P 23
- “I might fail the test” P25
- “Getting bad mark” P40
- “Not reading the questions right” P62

However, as the interviews continued responses diversified into the discrete styles of response.

### 3.6.8.2 *Standard responses.*

‘Standard responses’ encompassed the majority of responses to the interview technique. Responses within this category were deemed by the researcher (and an independent researcher) to be typical of the worries expected by typical participants of this age-group. Responses focused on short-term, non-catastrophic but potentially worrying outcomes to the interview scenario. Recurring themes within this category included social issues (being bullied, losing friends), parental reaction (being punished or disappointing parents), personal (feeling embarrassed or losing confidence) and academic (being reprimanded by teachers, being moved to different class). Typical examples of each theme are outlined below:

#### Social/ peers

- “Everyone might laugh” P11
- “I’d worry that everyone thought I was stupid” P21
- “Your friends will leave you out... You will not be very happy” P43
- “I’d get bullied” P57
- “No one to play with... sit around doing nothing” P46

#### Personal

- “I’d just be embarrassed” P13

#### Parental reaction

- “I might get grounded.... I will get really bored” P15
- “My Mum would not be very happy with me... I don’t want to hurt her feelings” P21
- “[Mum] would think that I don’t pay attention and I don’t want to learn” P27
- “[My parents might] stop me watching telly” P31
- “[My parents] might tell me off quite badly” P49

## Academic

- “You might get moved down into a different maths set... might not know anyone in the new maths set” P22
- “I wouldn’t get a good grade” P66

### ***3.6.8.3 Extreme responses.***

‘Extreme responses’ were those in which the responses given were along similar themes as the standard responses, but reached a catastrophic and unlikely conclusion. They differed from the long term responses in that participants anticipated an immediate (or very short-term) catastrophic outcome to the scenario.

- “I wouldn’t be able to cope anymore.... I’d completely lose it” P17
- “Moving away from my friends... never seeing them ever again” P29
- “Could end up killing myself” P32

### ***3.6.8.4 Circular responses.***

‘Circular responses’ also featured similar themes to the standard responses, however, participants would enter into a recursive loop of worries, meaning that the interview and the worry could continue indefinitely. In these cases, participants (after a varied number of repeats of the loop) would indicate in some way that this would become a perpetual cycle:

- “Make me sad...[I might] cry in front of the class... everyone will think I’m a cry-baby... people being mean... make me sad... it would just go round again” P40

- “Make me move school... will not have any friends... will not have anyone to play with... will not have any fun... might have to move school again... will just keep going round” P62

#### ***3.6.8.5 Long-term responses.***

‘Long-term responses’ were those whereby, after beginning the interview identifying similar themes as the standard responses, participants would go on to outline the effects of the scenario on their adult life. This typically included the impact on their future academic success, career, housing and finances, and long-term health and mortality.

- “I wouldn’t get a good job and would have to work in McDonalds” P14
- “Getting addicted to them [drugs].... Dying” P19
- “Not [getting] a good job... not having a house” P26
- “You won’t live a very long life and die young” P43
- “When I get old no-one could help... I would not be well... I’d die!” P66

#### ***3.6.8.6 Summary of qualitative content analysis of response style.***

Although the responses of participants initially began in a largely consistent manner, it was evident that as the task continued participants would deviate into different types of response style. It was possible to categorise these responses into four primary response styles which encompassed all 95 of the analysed interviews. Although the majority of participants’ worry bouts revolved around short-term, feasible outcomes to the given scenario (for example making a mistake during a presentation and being laughed at or doing badly in a test and moving maths set), some participants demonstrated alternative response styles, for example a repetitive

rumination on a few possible outcomes, or rapidly reaching very extreme and unlikely outcomes for the initial scenario. Additionally, participants differed in the duration of outcome they considered during the task, either remaining focused on the immediate consequences or continuing to expand on the outcomes of the scenario into adolescence and adulthood.

### **Section 3.6.9 Quantitative content analysis of response style.**

Research Question 4b: Do high and low worriers demonstrate different response styles?

Hypothesis 4: High and low worriers will present with different styles of catastrophizing interview response.

In order to quantitatively analyse participants' responses, the final coding scheme was arranged hierarchically, and all interviews were coded based on the highest level of the coding scheme in which the responses fell. To simplify the analysis responses were coded based on the overriding category (for example 'standard response', as opposed to the sub-section of 'standard response – academic'. A worked example of this is provided in Appendix Q. In order to integrate each participant's two responses into a single quantitative analysis, each participant's highest level of response (across the two interviews) was used for the analysis.

Given Szabo and Lovibond's (2004) finding that children with clinical levels of worry are more likely to engage in worrying with a ruminative style, it was hypothesized that the High Worry group were more likely to engage in the circular type of worry response. Additionally, based on the findings of Provencher et al. (2000) it was hypothesized that children in the High Worry group would be more

likely to reach extreme conclusions to their worry bouts than children in the Low Worry group. Finally, given that Low worriers were more likely to use worry as a problem-solving technique (Davey et al., 1992) it was predicted that Low worriers would be more likely to remain focused on the short-term, more realistic outcomes of the scenario.

Using a 4x2 chi-squared test a significant difference was demonstrated between the response style of high and low worriers ( $\chi^2 = 10.38, p < .01$ ). See Table 6 for response style cross-tabulation. Extreme and circular response styles were associated with high levels of worry. Those in the Low Worry group were more likely to make long-term responses than those in the High Worry group.

Table 6  
*Response style of High and Low Worry groups*

		Response Style					
			Standard	Extreme	Circular	Long-term	Total
Worry Group	Low	Count	12	1	1	10	24
		Expected count	10.3	4.9	2	6.9	24
	High	Count	9	9	3	4	25
		Expected count	10.7	5.1	2	7.1	25
Total		Count	21	10	4	14	49
		Expected count	21	10	4	14	49

### 3.6.10 Summary of research question four.

To summarise, the qualitative analysis of the responses of participants identified a number of separate response styles displayed by participants. On further analysis, it was identified that Extreme and Circular responses were more likely to be given by participants within the High Worry group, whereas Long-term responses were more likely to be made by the Low Worry group, and Standard responses were equally likely to be given by participants within either worry group.

### 3.7 Distress Scale

Participants rated their level of emotional distress following each interview response. The highest distress rating for each interview was recorded for analysis of the interview's emotional impact on participants.

Table 7

*Descriptive Statistics for the Emotional Distress Scale*

Interview	N	Mean	Standard Deviation	Minimum	Maximum
Scenario 1	88	2.73	2.25	1	10
Scenario 2	85	2.35	2.03	1	10

### 3.8 Summary of Results

This study found mixed results for the relationships between the main variables. Although the initial correlation between the catastrophizing interview task and the PSWQ-C was found not to be significant, once the confounding effects of verbal ability and social desirability had been controlled the partial correlation

between the sum total number of steps generated on the two interview tasks and the PSWQ-C was shown to reach significant levels.

Additionally, both the first administration of the interview and the total of the two interview steps significantly correlated with measures of verbal fluency and verbal reasoning. However, the extent of the correlations in all cases was low. Although the number of steps generated on the interview was found to correlate significantly on successive administrations, the size of the correlation was insufficient to provide evidence of good alternate form reliability. A number of different interview response styles were identified through the qualitative analysis, and some significant differences between the response styles of high and low worriers were found, thus supporting the hypothesis of research question four.

## **4. Discussion**

### **4.1 Overview**

This chapter considers the results and implications of this study within the context of its design and implementation, and the previous research identified within chapter one. Initially, the study's aims and main research questions are restated, before the main findings and analyses are summarised and presented in relation to existing research and theories. Methodological strengths and limitations are considered, and the theoretical and clinical implications of the study's findings are explored. This section ends with discussion of possible future research and a final conclusion.

### **4.2 Summary of Study Aims and Research Questions**

The primary aim of the study was to assess the viability of the catastrophizing interview technique as a measure of childhood worry. In order to do this, the relationship between the number of steps generated using the interview was compared with tendency to worry as measured using the PSWQ-C; this relationship was further explored including mediating variables relating to social desirability, verbal reasoning and verbal fluency, and the measure's alternate form reliability was explored. Finally, the response style of high and low worriers was assessed in order to determine whether the type of response provided by participants could differentiate between the high and low worry groups.

### **4.3 Research Question One: Does the Catastrophizing Interview Task Demonstrate Concurrent Validity when Compared to an Existing Measure of Worry in Children?**

Hypothesis 1: The number of steps generated in the catastrophizing interview will correlate with scores on the Penn State Worry Questionnaire for children (PSWQ-C).

This hypothesis was not supported, as a significant positive relationship was not detected between the PSWQ-C and the number of steps generated on the interview. Comparing those in the high and low worry groups based on the PSWQ-C with the number of steps generated using the interviews, high worriers did produce numerically more steps than the low worriers. However this did not reach a statistically significant level of difference. These findings are in contrast to studies using adult participants (e.g. Vasey & Borkovec, 1992; Davey & Levy, 1998; Hazlett-Stevens & Craske, 2003) whereby the number of steps generated using the interview technique was positively correlated with tendency to worry. Assuming that this is a true result, and not due to methodological concerns, this would suggest that the developmental level of children aged 9-11 means that they do not respond to the interview in the same manner as adults.

Although research has found evidence that children can worry from the age of approximately five (Vasey et al., 1994), it does not follow that the processes involved in a worry bout are the same across the lifespan. From a developmental perspective, there are compelling reasons why children's worry bouts may not proceed in the same manner as adults. Detailed exploration of brain development over childhood and adolescence using fMRI scans has demonstrated significant growth in the areas of the brain associated with executive functions such as planning and reasoning (e.g. Rapoport et al., 1999; Supekar et al., 2009) which continues into early adulthood. As these abilities are central to the complex, anticipatory nature of a

worry bout, it is developmentally unlikely that young children would be able to engage in such an activity in as much depth as an adult.

Similar conclusions can be drawn from other cognitive theories of child development. For example CCC theory (Zelazo et al., 2003) suggests that the level of complexity and flexibility of thought develops through several stages during childhood. As a catastrophizing worry bout requires the anticipation of multiple possible events occurring in the future, this would not be possible during the initial, ‘stimulus-response’ stage, where children can only cognitively process their immediate environment and actions. The development of increasingly complex rule associations allows the predictive thought required for a worry bout, although this will not be fully developed by middle childhood. Similarly, RC theory (Halford et al., 2007) suggests that individuals’ reasoning ability does not reach its full capacity until at least the age of 11 (Halford et al., 1998).

According to the Piagetian stage theory of cognitive development, from approximately the age of 7 children should begin to anticipate future events in the manner required by the catastrophizing task, but in a concrete, rather than abstract fashion. It could therefore be the case that children of the participants’ age may engage in catastrophizing worry bouts when faced with a real-life situation, but are unable to engage in this in the more abstract, theoretical way required by the research situation.

It would appear from the study’s findings that these factors do not equally affect children’s tendency to worry (as measured using the PSWQ-C). If this were the case, both the PSWQ-C and catastrophizing interview would be similarly affected by the developmental level of the participant. However, it is important to note that the PSWQ-C is a measure of tendency to worry, rather than of current level

of worry. Although these would be expected to correlate to some extent (with those with a greater tendency to worry being more likely to worry more in any given situation), the two concepts are not synonymous. Unfortunately, due to the limited number of validated measures of worry, the PSWQ-C was the closest approximation to a measure of worry with which the catastrophizing interview task could be compared. Statements such as ‘I’ve been a worrier all my life’ and ‘many things make me worry’ do not necessarily capture the same construct of catastrophic or perseverative worry as the catastrophizing interview. Similarly, it has been well documented that children do show evidence of catastrophizing from an early age (Sullivan et al., 2001). However the measures used to assess this have typically looked for only one catastrophic thought (e.g. “I worry I will always be in pain” from the Pain Catastrophizing Scale for Children, Crombez et al., 2003) as opposed to the perseverative catastrophizing bouts looked for using the catastrophizing interview.

It may be that, at this age, an emergent tendency to worry has not yet developed into the ability to manipulate, express and expand upon worries in the same way that adults and adolescents may be able to. This suggests that within this age-group, the artificial construction of the interview task may not in fact replicate the process of an actual worry bout, thus limiting the ecological validity of the interview task and its usefulness in understanding childhood worry. In a study using pre-school age participants, Atance and Meltzoff (2006) found that children’s decisions about future events were affected by their current physiological state. It may be that this holds true for older children, and for mental as well as physical state; therefore the future outcomes generated using the catastrophizing interview may be partially dependent on the child’s in-the-moment level of anxiety.

#### **4.4 Research Question Two: Is the Relationship Between the Catastrophizing Interview Task and Worry Affected by Children's Cognitive and Social Development?**

Hypothesis 2: The relationship between the catastrophizing interview and PSWQ-C will remain significant when the effects of verbal fluency, verbal reasoning ability and social desirability of response are controlled for.

Although hypothesis one was not supported by the research findings, it was possible that this was due to the confounding effects of the other main variables used within the study. Owing to the low levels of correlation between variables, it was not appropriate to use a multiple regression to investigate the relationship between the main variables. However, it was possible to use a partial correlation to investigate the effects of controlling verbal fluency, verbal reasoning and social desirability of response on the relationship between the catastrophizing interview task scores and the PSWQ-C. This analysis provided limited evidence of a relationship between the two worry variables. Although the number of steps generated on the individual administrations of interview task one and two still failed to show a positive relationship with the PSWQ-C, the total interview score (sum total of steps generated on task one and two) was now found to be significantly correlated with the existing worry measure. This provides some evidence that, once the effects of varying levels of verbal ability are removed, the interview task can be seen to measure the same underlying construct of worry as the PSWQ-C. This finding suggests that the interview technique is not purely assessing children's level of verbal ability, but is also measuring the construct of worry to some extent.

However, the weakness of the correlation ( $r = .206$ ) indicates that tendency to worry scores fail to account for the majority of the variance in the interview task scores. Consequently, although this finding does provide some evidence that the catastrophizing interview may be tapping into the same construct of worry as the PSWQ-C to some extent, nevertheless it fails to demonstrate the strength of association that would be required to give the interview concurrent validity.

Again, this finding can be understood by taking a developmental perspective on worry. As verbal reasoning and verbal fluency are cognitive abilities, by controlling for these it is likely that the effects of the participant's overall level of cognitive development are partially controlled. This may be particularly relevant with the age group used within this study, as they are of the age at which the cognitive abilities required to engage in complex worry bouts are likely to be emerging. Had the study used a younger sample, it is likely that the number of steps generated would be predominantly based on the participants' level of verbal ability, as they would be expected to lack the higher-order cognitive skills required to genuinely engage in an abstract worry bout. Conversely, with older participants, it would be predicted that the number of steps would be predominantly based on their level of worry (as has been demonstrated in research using adult samples). As brain imaging studies have demonstrated, middle childhood is a time of significant growth (e.g. Rapoport et al., 1999, Supekar et al. 2009, Thompson et al., 2000) and is consequently a period where the developmental levels of ability of participants may be particularly relevant when exploring psychological processes such as worry.

#### **4.4.1 Relationship between the catastrophizing interview and other main variables.**

A significant positive relationship was identified between the measure of verbal fluency and two of the three interview scores. This finding was repeated with the measure of verbal reasoning and the interview. This is in keeping with the expectation that participants' verbal ability could impact on their ability to engage with the interview technique, and with the expectation that levels of cognitive ability are likely to be of importance in catastrophizing worry bouts.

No relationship was identified between the CSDS and the interview technique. Due to concerns regarding the validity of this measure (see section 4.7.2.3 for further discussion), it is difficult to draw even tentative conclusions from this finding.

#### **4.5 Research Question Three: can the Catastrophizing Interview Technique be Demonstrated to have good Levels of Alternate form Reliability?**

Hypothesis 3: The number of steps generated in the catastrophizing interview on first and second administration will correlate significantly for each participant.

This hypothesis was not supported, as although a significant relationship was found between the two administrations of the interview tasks, the level of correlation was insufficient to consider this as evidence for a high level of alternate form reliability. This differs from findings using adult participants, such as that of Davey and Levy (1998), who found that the interview technique captured evidence of a general perseverative iterative style which was consistent across a number of different scenarios (both positive and negative). However, a number of issues

relating to the administration of the two interview scenarios may have impacted on these results. In order to minimise the impact of fatigue or practice effects, it may have been better to counterbalance the two scenarios. Indeed, as participants produced fewer steps on average for the second administration of the interview, this suggests that fatigue in particular may have had an effect on the responses of participants. Additionally, it is not clear from the present research the extent to which individual participants worried about the topics provided. Consequently, it may be the case that participants' scores across alternate forms of the interview are consistent when the effects of their personal level of worry regarding the topic is controlled for. If time had allowed, the re-administration of the same scenario a week following the initial interview would have elicited further information regarding the reliability of the measure (although practice effects may still have affected the actual raw scores).

#### **4.6 Research Question Four: Do Different Participants Present with Different Styles of Response to the Catastrophizing Interview Tasks?**

Hypothesis 4: High and low worriers will present with different styles of catastrophizing interview response.

As predicted, a significant difference was found between the response styles of high worriers versus low worriers. This preliminary exploration found high worriers more likely to respond in either an extreme, or circular, style than those who had a lower tendency to worry. This is in keeping with the observations made by Turner (2010) following her study of participants aged 11-13, and is consistent with the findings of Provencher et al. (2000) and Szabo and Lovibond (2004). The finding

that low worry group were more likely to identify the long-term consequences of the scenarios was less expected, as it would be predicted that those with a greater tendency to catastrophize might be more prone to exploring the long-term implications of the research scenarios.

The topics of worry identified by participants included peer relationships, personal harm, academic failure and their future prospects. These are similar to the themes identified by Silverman et al. (1995). Additionally, Weems et al. (2000) found that, although worriers and non-worriers focused on the same topics, worriers reported their worries as significantly more intense than non-worriers. It may be that the findings of the present study support this difference between the two groups. Certainly, it was apparent in this study that both high and low worriers would begin their worry bout within the interview with similar themes, and would identify worries within similar themes (such as academic failure and poor peer relationships), although the high worriers were more likely to take these to extreme conclusions. This result also mirrors the findings of Provencher et al. (2000) who found in adults that high worriers would produce more serious outcomes than low worriers.

## **4.7 Subsidiary Analysis**

### **4.7.1 Demographic data and the catastrophizing interview task.**

Competing evidence has been found suggesting the presence or absence of gender differences in childhood worry. This study found no gender differentiation in scores generated using the PSWQ-C. This supports the previous research by Muris et al. (2002) and Brown et al. (2006), who also found no significant difference between the worry levels of male and female participants. However, it could be the case that in the present study (and in previous studies finding the same result), individuals of

both genders were more likely to volunteer if they experienced greater tendency to worry. The slight gender imbalance in the participant group (55.7% of the sample were female) could reflect the increased number of girls who experienced worry and were consequently interested in taking part in the study. Additionally, the High Worry group of participants consisted of 16 females and 9 males (64% female) as opposed to the equal number of male and female participants in the Low Worry group, suggesting a gender difference in the number of more highly worried participants that was not significant enough to be identified by the statistical analysis (either through the overall small difference in levels of worry between the two genders or due to a relatively small sample size).

Using the catastrophizing interview technique, a gender difference did become apparent. On the first administration of the interview, female participants produced significantly more worry steps than male participants. This finding was not found for the second administration of the interview. This is consistent with the findings of Muris et al. (2000) and Silverman et al. (1995), who found a gender difference in this direction.

The lack of effects of age on the main variables of the study is consistent with the majority of theories of child development, which suggest that children of ages 9 to 11 are within the same broad stage of development (e.g. Piaget, 1952). Neurocognitive studies have found a significant amount of development within areas of the brain responsible for verbal ability and executive functions (all key to participating in the catastrophizing interview task) peaking at the age of 11-12 (Rapoport et al., 1999) and just prior to and during puberty (Thompson et al., 2000).

## **4.7.2 Participant scores on main measures.**

### **4.7.2.1 PSWQ-C.**

It was notable that the scores generated on this measure were significantly higher than the normative data provided by Muris et al. (2001). Participants reported greater levels of worry than would be expected given normative data, with a PSWQ-C mean of 15.03, as opposed to Muris' finding of 7.1. There are a number of possible reasons why this may have been the case. Firstly, cultural differences between the present sample and Muris' Dutch participants may reduce the applicability of the normative data for this participant group. Alternatively, the nature of the study and the recruitment procedure may have affected the sample that chose to participate in the study owing to self-selection. It is possible that, as a study on childhood worry, children who experienced greater levels of worry may have been more likely to volunteer than those with lower levels of worry, thus biasing the sample towards higher worry scores. Additionally, the focus of the study and its participant information may have primed participants to consider their own worries to a greater extent, temporarily increasing their self-reported tendency to worry.

This study used the PSWQ-C to differentiate between high and low worriers, which is a different technique to that of Borkovec (1992), who identified worriers through self-report of amount of time worrying (over 50% of the time for high worriers, less than 10% of the time for low worriers). It is possible that using this scale may have produced a clearer distinction between the number of steps generated by both groups, and consequently may have revealed the same difference in number of steps as Borkovec originally found.

#### **4.7.2.2 FAS test.**

An unforeseen limitation of using the FAS test of verbal fluency was the use of school classrooms as a research base. The research was conducted within a variety of rooms within three separate schools. It proved impossible to remove all visual prompts in the testing rooms, meaning that for some participants a number of relevant words were in plain sight for the letter administrations of the test. No ‘Animal’ related words were evident in any of the testing rooms. For this reason, it was decided that only the Animal subsection of the FAS test would be included in the final statistical analysis.

#### **4.7.2.3 CSDS.**

The Children’s Social Desirability Scale was used as a measure of social desirability of response, and of participants’ likelihood of continuing to provide responses to the task in order to please the researcher, irrespective of their genuine desire to continue. Previous studies had demonstrated good levels of internal consistency (e.g. Crandall et al., 1965) and test-retest reliability (e.g. Baxter et al., 2004) for this measure. Due to the limited availability of measures of social desirability of response appropriate for use with child participants, it appeared that this was the most suitable measure available. However, the floor effect of low scores skewed the distribution of results and may be indicative of poor validity of the measure. Over 25% of the sample generated a total score of 0 or 1, indicating very low levels of social desirability of responses, as opposed to only 3.3% scoring at the other end of the scale with scores of 10-14. The age of the measure and its American origins may mean that it cannot be considered an effect measure of social desirability for today’s UK youth. It was also unclear during the administration of the scale

whether a high social desirability score would in fact provide evidence of a tendency to tailor responses to the catastrophizing interview in a socially desirable (i.e. pleasing to the researcher) way. It appeared to the researcher that some participants strove to answer the CSDS questions in a completely honest way (even when it caused them mild embarrassment) in order to ‘do the right thing’ and participate well. Others, however, may have given false responses as they wished to appear socially acceptable. Either extreme of score could therefore be interpreted as indicative of the participant’s desire to please the researcher, and consequently either could have an impact on the participant’s responses to the interview task.

Additionally, it seems likely that the sensitivity of the measure is less than adequate. Participants appeared happy to admit to the majority of the statements (for example not listening to their parents or not keeping their rooms tidy), with only questions relating to making fun of people and saying unkind things to people seeming to cause any discomfort to admit to. Given the cultural changes since the development of the measure, it is likely that a more up-to-date version focusing on issues such as bullying may be more pertinent.

Given the inherent power differential between researcher and participant, and the findings of Waterman et al. (2004) that children will even strive to answer nonsensical questions if pressed to by a researcher, the possibility of social desirability effect on responses cannot be ignored. As it seems likely that the CSDS failed to capture this aspect of the participants’ responses adequately, it is uncertain whether children’s eagerness to please the researcher contributed to the variability of interview scores.

#### **4.7.3. Conclusions regarding the use of the catastrophizing interview technique with children.**

The results of this study, regarding the relationship between the catastrophizing interview tasks and worry in children, were mixed. Although no correlation was found between the number of steps generated on the interview and the PSWQ-C, once the effect of verbal ability was controlled some evidence of a relationship became apparent. Additionally, those assigned to the High Worry group were more likely to generate extreme or circular responses than those in the Low Worry group. A number of explanations could account for these findings. Firstly, it could be the case that children's worry bouts differ from those of adults. Consequently, although worry is evident in children as young as 4, it may be that the process and experience of worry is developmentally specific, and therefore non-comparable across the ages. This would be in keeping with developmental theories and models, which suggest that the skills required to engage in a detailed worry bout (such as the anticipation of future possibilities, holding multiple scenarios in mind, planning, abstract reasoning and verbal abilities) emerge over the course of childhood and adolescence. Therefore, the internal working of a worry bout may differ considerably between childhood and adulthood, although the resultant experience of being worried may be similar. This would be in keeping with the finding that the High Worry group were more likely to produce extreme outcomes, despite not producing significantly more steps than the Low Worry group.

Secondly, it may be the case that although the process of worry is similar from middle childhood onwards, that the demands of the catastrophizing interview task are too complex for children aged 9-11 to engage in. For example, the expectation that children will be able to create a worry bout within a research setting

that reflects their worry process in a real-life situation may not be realistic. It may either be too difficult for children to engage in these tasks in an abstract manner, or it may be that child participants are more likely to view the interview tasks as an imaginative challenge as opposed to a genuine reflection of their worries.

Thirdly, it is possible that the methodological concerns raised in this discussion have impaired the relationship between the catastrophizing interview technique and childhood worry, and that, with amendments, it is found that children are able to engage in the interview tasks in the same manner as adults. Alternatively, it may be that with the use of a superior measure of social desirability of response, that it becomes clear that the number of responses to the interview provided by children is determined more by their desire to please the interviewer, than by their actual level of worry.

Unfortunately, the exploratory nature of this study, and the lack of previous research exploring childhood worry in a similar way, means that it is not possible to draw firm conclusions regarding which of these interpretations is most likely to account for the findings of this study.

## **4.8 Ethical Considerations**

### **4.8.1 Emotional distress.**

All participants were asked to rate their level of emotional distress at each step of the interview. As predicted, the interview did not typically elicit high levels of emotional distress within participants, as the scenarios were selected for their low level of intensity. However, some participants did rate their distress as a 7 and above, at which point they were given the option of terminating the interview. Only one participant selected the option to end the interview.

It was not entirely clear how successful the emotional distress rating scale was for eliciting participants' actual, in the moment, level of emotional distress. On several occasions it was noted that the participants' visual affect did not appear to correspond with the ratings they were providing. Some spontaneously offered remarks such as, "That would make me feel really bad." while completing the distress rating. When prompted with the question, "Is that how you would feel if that happened, or how you feel right now talking about it?" several participants confirmed that they were responding to how they would feel if the catastrophic outcome occurred. Whilst some participants then amended their distress rating and appeared to correctly rate their current experienced emotion from that point on, it appeared that some participants were unable to keep this instruction in mind throughout the interview.

Conversely, there is the possibility that participants may have felt pressure to rate their level of emotional distress as lower than they actually felt. The distress rating was visible to the researcher throughout the interview, and participants may have felt social pressure to minimise their rating of the emotional distress caused by of the interview in order to spare the feelings of the researcher. A further, anonymous brief questionnaire exploring the participant's response to the interview could have avoided this possible demand characteristic.

In order to ensure that the rating scale was age-appropriate, visual images were included alongside the numerical chart. All participants appeared to be able to access this form of self-rating, evidenced by comments suggesting that the rating scale itself was developmentally appropriate.

Several participants gave what could be expected to be emotionally distressing responses to the scenarios. For example, participant 32, when responding

that in response to giving a presentation in front of her class could “end up killing [herself]” rated her emotional response whilst completing this step of the interview as a rating of 1 (totally fine), which was congruent with her appearance, tone of voice, and other non-verbal behaviour. This suggests that the participant was treating the interview as an academic exercise, as opposed to revealing genuine worries and concerns. Similarly, participants who suggested the long-term consequences of the scenarios would be that they would die did not demonstrate signs of distress whilst completing the interview, either through their self-ratings or their appearance and behaviour. This suggests that overall participants of this age-group are not unduly distressed by completing the interview, even when potentially distressing topics are raised. There are several possible reasons for this. Firstly, the use of low-intensity interview scenarios may have been effective in keeping levels of distress low. However, as participants quickly moved on from the scenario in question to their own responses this may not be the case, as you would expect worries such as death or homelessness to create higher levels of affect. Alternatively, it may be the case that, by using pre-selected scenarios rather than asking participants to select their own, personal, worry scenario, participants treated the interview as an academic exercise as opposed to considering their own worries, and consequently did not feel distressed. The finding that the interview did not elicit high levels of distress in participants of this age-group may therefore not hold true if more personal worry topics were chosen.

It could also be that the nature of worry prevented participants from experiencing high levels of emotional distress throughout the interview. As previously discussed, some researchers (e.g. Borkovec & Hu, 1990; Stöber, 1998) have suggested that the function of worry is to prevent individuals experiencing the

more emotional and physical effects of anxiety. The low distress scores demonstrated by participants could be interpreted as confirmatory evidence of this.

Additionally, this result can be interpreted using the findings of Szabo (2009) that children were more prone than adults to worry about high-cost, but low-probability, topics. This could explain why topics such as death and homelessness were relatively common within the worry themes, as these would be high cost yet low probability consequences of taking a maths test or talking in front of the class. The recognition that these are unlikely could account for the low levels of emotional distress displayed by participants.

#### **4.8.2 Informed consent.**

In order to be included in the study, participants had to provide both their own assent and parental consent. This prevented a number of interested young people from taking part as they had failed to gain written parental consent in time to participate. It may be the case that the requirement to provide parental consent also biased the sample, as parents with worried children may be more likely to view the research as relevant, and encourage their participation.

Although the strict requirement for parental consent limited the number and possibly range of participants, due to their age it would have been unethical to consider allowing participation from those whose parents had not consented. Additionally, it was essential that the children themselves provided assent, and that this was done following an explanation by the researcher of what participating would involve. In no instances over the course of the study did a child refuse to give assent or withdraw their assent during the interview process. As it was the responsibility of the children themselves to return the parental consent form, it is likely that any who

were unsure whether they wished to participate would either in the first instance not seek parental consent, or would not return the forms to the researcher and therefore were not identified as potential participants.

### **4.8.3 Confidentiality.**

In several instances, the responses provided by the participants, either during the interview or arising from the PSWQ-C, suggested a high level of worry. In these cases, this was brought to the attention of the schools' Special Educational Needs Co-ordinator, as these were identified as the members of staff responsible for the emotional well-being of the participants. This decision was discussed with the participant during the research interview, and in all cases participants agreed to this occurring.

## **4.9 Methodological Strengths and Weaknesses**

### **4.9.1 Design.**

The study used a mixed-methodological approach in order to explore the use of the catastrophizing interview with a novel participant group. The exploratory nature of the study reflected the scarcity of previous research into this area, which meant that much of the design and hypotheses were based on theoretical assumptions rather than a clear existing evidence-base. The use of both quantitative and qualitative research methodologies allowed a thorough investigation of the use of the catastrophizing interview technique with children, facilitating both an analysis of the statistical significance of the results and its potential for use as an experimental measure, and a deeper investigation of how the interview technique might help researchers understand the processes involved in a worry bout.

One strength of the study was the relatively large sample, which met the requirements of power analyses in order to limit the possibility of a type II error in the statistical analysis. This allows cautious conclusions to be reached regarding the relationship of the interview with the other main variables, in the knowledge that in cases where a relationship was not found it is unlikely to be due to statistical error.

A further strength of the research is the original nature of the questions posed. As with all burgeoning fields of psychological research, exploratory studies are required in order to begin to build the evidence-base required and to aid later exploration. Previously, no published studies had attempted to validate an experimental measure of worry for use with child participants, and little literature was available on the subject. The aim of this study was to provide a small contribution to filling this gap in the research knowledge on this topic.

However, this study was not without its limitations. As there was an extremely limited existing literature regarding the use of the catastrophizing interview with children, potential mediating factors were limitless. In order to keep the research interview to a feasible length, based on the predicted attention-span of participants and the constraints of the school day, only a few factors could reasonably be considered. Again, the lack of validated measures in other areas of childhood psychological research meant that some of the measures used (i.e. CSDS) were possibly not ideal and may not have captured the variables as successfully as would have been liked.

The use of researcher-assisted self-report can be viewed as both a strength and weakness of the employed design. There were a number of benefits of using this method, including the assurance that all data were collected without any missing data, and the fact that the researcher could ensure whenever possible that the

participant had understood the aims of the measure and the appropriate way to complete it. However, this procedure may also have affected the responses given by participants – for example affecting their responses on the PSWQ-C. Additionally, the lack of any measure of worry other than self-report leads to the possibility of respondent bias. Previous research has demonstrated that social desirability of response can unduly bias responses (Logan, Claar, & Scharff, 2008), however the use of the CSDS attempted to measure this effect and add it into the quantitative analysis. Nonetheless, the use of a further measure of childhood worry as reported by the participant's teacher or parent would have been a further method of assessing the use of the interview; however, due to the sample size required and the difficulties inherent in collecting these data this was not done.

A further weakness of the researcher-assisted responses was that this made the interview more time consuming than if some parts had been by independent self-report, and meant that the entire data collection for each participant had by necessity to take part in one sitting. It is possible that this led to fatigue in some participants, as the total participation time was in some cases over an hour. The fact that the two administrations of the interview were administered back-to-back, and were not counterbalanced, may also have had a negative impact on the alternate form reliability of the interview. From the researcher's subjective experience, it appeared as if some participants became weary and seemed to cut short the second administration of the interview, whereas some participants appeared to grow in confidence following the first administration of the interview and provide much more detailed answers on the second administration. The reliability of the measure was solely assessed using two individual scenarios one immediately after the other, giving rise to a number of possible confounding factors such as practice effects,

fatigue, or participants' personal differences in worry based on the two scenarios. This, and the lack of counter-balancing, means that it is difficult to assess the extent to which differences between the two sets of responses were due to the limited reliability of the measure and how much to other factors. A further limitation in this respect was the failure by the researcher to establish the participants' personal level of worry regarding the two scenarios, so it is not possible to determine whether participants provided a greater number of responses on the scenario they found more worry-provoking.

As mentioned above, the use of the two hypothetical scenarios is another possible limitation of the study. Although the use of hypothetical, common yet low intensity worries successfully limited the reported level of discomfort of participants in taking part in the study, it has left some questions in regards to establishing the validity of the interview technique. Whereas studies with adult participants have commonly used either entirely novel, abstract scenarios (such as imagining yourself as the Statue of Liberty) or drawn on participants' own worries, this study used the middle-ground of familiar but hypothetical worries. The reasons for this were carefully considered when designing the research – due to the age of participants it was possible that they would be unable to use abstract reasoning in order to generate worries based on an entirely novel scenario, and due to ethical concerns regarding participant distress it was not felt it would be appropriate to draw on participants' own worries as this may lead to significant distress. However, further exploration of each participants' personal level of worry in regards to each scenario would have added greater depth to the analysis (although would also have taken more time during the interview administration).

#### **4.9.2 Sample.**

The use of a school-based sample meant that it was possible to recruit a sufficiently large sample for this study. The community sample also ensured that participants were not excluded on the basis of their level of worry or other psychological disorder, and consequently the sample would be expected to be relatively representative of the population of interest. The gender and ethnicity mix of the sample is largely representative of the area in which the research was conducted.

The use of a school-based sample also meant that it was not possible to isolate participants from each other for the duration of the study. Although this was unlikely to have a major impact on the results as the study did not require any misdirection or concealment of information from participants, it was not possible to control for participants' prior knowledge and expectations of the study prior to their participation.

The self-selected nature of the sample (approximately 24% of the children approached consented to take part in the study) may have had an adverse effect on the findings of the study. However, due to the possibility of distress it would not have been ethical to recruit children without express parental consent, or to have compelled participants to take part in the study.

#### **4.9.3 Measures.**

As previously mentioned, there are an extremely limited number of measures validated for use with children as opposed to adult participants. Consequently, the measures selected for use in this study were not without their limitations. Identifying

an appropriate measure of participants' tendency towards socially desirable, researcher-pleasing responses was particularly challenging. The CSDS was eventually identified as a feasible measure for this as it was of an appropriate reading level and length to be used with the relevant age of participants, and also had some face validity regarding the questions it asked. A critique of the use of the PSWQ-C and CSDS has already been included in the above analysis of the findings (section 4.7), so will not be replicated here. To summarise, a number of possible flaws in the choice of measures may have impacted on the findings of the study, with the omission of additional measures of worry and the possible lack of validity of the CSDS potentially having the greatest effect on the results.

#### **4.9.4 Analysis.**

A number of factors impacted on the quality of the analysis conducted for this study. As with all research, the size of the sample recruited for the study had to be limited due to time and cost restraints. This impacted on the number of variables that could be assessed, allowing for sufficient power to minimise the possibility of type II error.

The qualitative analysis could have been further improved by discussing the process children experienced, why they gave the answers they did, and what they were thinking. Again, this was omitted in order to minimise the anticipated length of the interview, in order to suit the developmental level of participants. Despite this, the qualitative content analysis successfully provides a more in-depth exploration of the responses provided by participants, and begins to analyse the manner in which children may respond to the interview technique. As it stood, the addition of a qualitative aspect to the analysis provided some further evidence of how children

may respond to the catastrophizing interview task, and identified a number of key themes and response styles common to this participant group. However, design of the study did not allow for a very in-depth, grounded exploration of the participants' experience of worry. In order to statistically analyse the response styles of participants, it was necessary firstly to qualitatively analyse the responses of a relatively large proportion of the sample. As the participants had written their responses to the interview task, it was possible to refer back to their own words for the qualitative analysis. However, it was not possible to refer back to individual participants to seek elaboration on their responses, or to delve further into the meaning of the interview or the responses they gave. However, the aim of this analysis was to use content analysis to code the response styles rather than to develop a grounded theory of worry.

#### **4.9.5 Summary.**

In conclusion, the study has some acknowledged limitations, meaning that the findings must be considered with caution. However, it successfully provides an exploratory assessment of the feasibility of using the catastrophizing interview with a child participant sample, and raises a number of questions which could usefully be explored as the next stage of understanding the process of eliciting catastrophizing thoughts from children.

### **4.10 Implications of the Research**

#### **4.10.1 Theoretical implications of the research findings.**

The finding that the catastrophizing interview task responses do not clearly and consistently correlate with PSWQ-C scores raises a number of questions

regarding the psychological and cognitive processes underlying worry in childhood, and the measurement of these. Firstly, the findings could be interpreted as support for psychological theories of cognitive development, which suggest that children of the sample age-group have not fully developed the cognitive skills present by adulthood. This is evidenced by the differences in the findings of the present study with previous studies using an adult participant base. The fact that the participants were able to understand and engage in the interview process, and to expand appropriately on their responses, is consistent with the suggestion that children of this age have largely developed the ability to engage in worry-type thinking processes (as suggested by Muris et al., 2002), and to anticipate and expand future events (Piaget, 1952). However, if children's thinking in relation to worry was identical to that of adults, it would be expected that their interview scores would correlate with their PSWQ-C scores.

It could be the case that the catastrophizing interview task requires an additional level of verbal ability, over and above the verbal and cognitive skills required to engage in more naturalistic, real-life worry bouts. Alternatively, it may be that children actually engage in worry bouts in a qualitatively different way to adults, and consequently the catastrophizing interview task is not a good approximation of the way children worry. Alternatively it may be the case that the PSWQ-C captures different aspects of childhood worry to the interview technique, and therefore both measures are capturing different (partially overlapping) aspects of the same or similar constructs.

Overall, the findings of this study confirm the need for further thought to be given to how children worry, and ways in which to capture and understand the processes of worry in childhood.

#### **4.10.2 Research implications of the research findings.**

The primary aim of this study was to investigate the use of the catastrophizing interview technique as a research measure for use with children. Based on the results generated, it would appear that the interview technique, as conceptualised in this research, cannot be considered as a robust and effective experimental measure of childhood worry. However, it was demonstrated that children aged 9 to 11 were able to engage in the tasks, and were able to respond to the 'if-then' nature of the interview questions. Additionally, the analysis of response styles suggests that it may be possible to distinguish between high and low worriers based on the type of response style they give. However, any conclusions regarding the effectiveness of the catastrophizing interview technique must be extremely tentative, given the exploratory nature of the research and the suggestions provided for methodological amendments and further studies. It may be the case that although this study failed to find the catastrophizing interview technique a highly effective measure of childhood worry, with the appropriate amendments to the task itself and to the other measures used, it could yet prove functional as an experimental measure. Given the lack of existing validated measures for use with children, this is a possibility that warrants further investigation. However, it may prove the case that the developmental differences between middle childhood and adulthood mean that the catastrophizing interview lacks the validity found with an adult population, and that further thought will need to be given to other possible ways to explore worry with children.

#### **4.10.3 Clinical implications of the research findings.**

As expected, it was found that children of this age-group were able to engage in the worry task, and showed the ability to catastrophize on the given scenarios. Additionally, participants appeared comfortable with the format of the interview, and with the concept of worries leading on one from another. As the catastrophizing interview technique was originally derived from decatastrophizing techniques used as a means of therapeutic intervention, this implies that children from the age of 9 would be able to engage in decatastrophization exercises.

However, the finding that children were able to provide lengthy chains of catastrophic responses without necessarily having a high tendency to worry reminds clinicians of the importance of checking the personal relevance of tasks to individuals seeking therapeutic interventions. Also, the fact that children within the research setting would raise issues such as drug addiction, homelessness and death without demonstrating any personal anxiety regarding these topics suggests these may not have been genuine worries they held. In clinical settings, as in the research setting, it is possible that children will engage academically in tasks that they perceive to have low personal significance, and to 'go along with' tasks in order to please the clinician, as opposed to because they find them of therapeutic benefit.

Additionally, the findings of this study highlight the clinical need for greater understanding of psychological processes in children. The differences in findings between the present study and those conducted with adult participants suggest that the processes underlying worry in children may be different to those in adults. The majority of psychological therapies for GAD and other anxiety disorders in children are based on those developed for use with adults, for example CBT-based

programmes such as ‘Coping Cat’ (Kendall, 1990), which incorporates decatastrophization exercises based on adult models of anxiety. Should it prove to be the case that children’s worry bouts are conceptually different to those of adults, this would suggest the need for more child-specific clinical interventions.

#### **4.11 Future Research**

The research findings have highlighted several possible future directions for research into childhood worry. Although this study did not find the catastrophizing interview to be an effective measure of worry in relation to the PSWQ-C, a number of highlighted methodological issues may be partially at fault. The failure to include the participant’s personal level of worry regarding each scenario was a significant oversight, and the repetition of this study with this factor included would be a valid improvement in continuing to assess the validity of the catastrophizing interview with children. Additionally, experimentation in using scenarios of a more abstract, or conversely more personally relevant nature, would also provide greater insight into the validity of the interview technique. Furthermore, reviewing and improving the measure used for assessing the participants’ eagerness to please the researcher would be worthwhile.

Continued investigation using a wider sample would also increase knowledge regarding the use of the interview technique with child participants. The age-range of participants in the current study’s sample was not as great as intended due to the difficulties in recruiting Year Six students. Additionally, it may prove that the recruitment process encouraged children with higher levels of worry to participate, meaning that the attempted discrimination between high and low worriers was false – participants being more likely to be moderate or high worriers than low worriers.

Further research employing a more focused sample of low and high worriers may find a better differentiation of interview responses for the two groups. Use of alternative methods to distinguish high and low worriers (such as clinical interviews or parental report) may also provide a clearer distinction between the two groups, and it may be that when using the interview technique to distinguish between more discrete groups it proves more effective.

The apparent link between worry, verbal ability and the interview technique also requires further research to clarify. As worry is a primarily verbal technique, it was anticipated that children's level of verbal ability would be a significant factor in relation to the interview. Further exploration of this would be beneficial in increasing the understanding of worry in childhood.

#### **4.12 Conclusion**

This study aimed to assess the validity of the catastrophizing interview technique with child participants. It tentatively concludes that, based on the analysis provided, the interview technique may not be a suitable measure to use with the age-group assessed. However, a number of methodological questions mean that this conclusion cannot be drawn firmly, and that it may be that the interview technique would prove appropriate given the suggested amendments.

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## Appendices

- A – Demographic questionnaire
- B – Penn State Worry Questionnaire for Children
- C – Children’s Social Desirability Scale
- D – Emotional distress scale
- E – Example of catastrophizing interview
- F – Example of completed catastrophizing interview record sheet
- G – Joe practice Item
- H – Polly practice Item
- I – Participant information sheet
- J – Participant assent form
- K – Parental information sheet
- L – Parental consent form
- M – Ethical approval confirmation letter
- N – Histograms of the main variables
- O – Histograms and box plots of transformed data
- P – Box plots of distribution of main variables
- Q – Example of coding of thematic analysis

## Appendix A – Demographic questionnaire

Participant Identification Number:

### DEMOGRAPHIC QUESTIONNAIRE

**Title of Project:** Can the catastrophizing interview technique be used to increase understanding of childhood worry?

**Name of Researcher:** Ceara Osleger, Trainee Clinical Psychologist.

Please complete the following information about your child by circling the appropriate response. Please return this questionnaire in the envelope provided with the consent form if you are willing for your child to participate in the research.

1. Please specify your child's gender Male / Female
2. Please specify how old your child is years \_\_\_\_\_
3. Please specify your child's ethnic group (please circle)

<b>White</b>	<b>Mixed</b>	<b>Asian or Asian British</b>	<b>Black or Black British</b>	<b>Chinese or other ethnic group</b>
British	White & Black Caribbean	Indian	Caribbean	Chinese
Irish	White & Black African	Pakistani	African	Other Ethnic Group
Other White	White & Asian	Bangladeshi	Other Black	
	Other Mixed	Other Asian		

**Please return this with the consent form in the envelope provided to the school office.**

**Thank you for your help.**

Appendix B – Penn State Worry Questionnaire for Children

Participant information number:

Directions: This form is about worrying. Worrying happens when you are scared about something and you think about it a lot. People sometimes worry about school, their family, their health, things coming up in the future or other kinds of things. For each sentence that you read, circle the answer that best tells how true that sentence is about you.

My worries really bother me	Never true	Sometimes true	Most times true	Always true
Many things make me worry	Never true	Sometimes true	Most times true	Always true
I know I shouldn't worry about things	Never true	Sometimes true	Most times true	Always true
But I just can't help it	Never true	Sometimes true	Most times true	Always true
When I'm under pressure, I worry a lot	Never true	Sometimes true	Most times true	Always true
I am always worrying about something	Never true	Sometimes true	Most times true	Always true
When I finish one thing, I start to worry about everything else	Never true	Sometimes true	Most times true	Always true
I've been a worrier all my life	Never true	Sometimes true	Most times true	Always true
I notice that I have been worrying about things	Never true	Sometimes true	Most times true	Always true
Once I start worrying, I can't stop	Never true	Sometimes true	Most times true	Always true
I worry all the time	Never true	Sometimes true	Most times true	Always true
I worry about things until they are done	Never true	Sometimes true	Most times true	Always true

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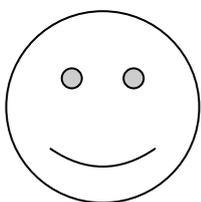
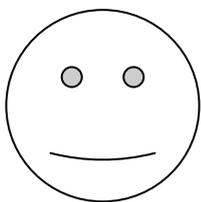
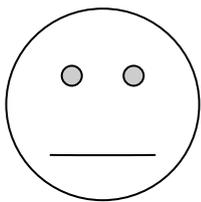
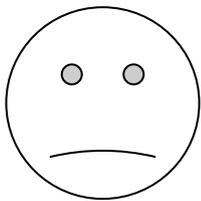
## Appendix C – Children’s Social Desirability Scale

Participant information number:

- Have you ever felt like saying unkind things to a person? (Yes/No)
- Are you always careful about keeping your clothing neat and your room tidy?  
(Yes/No)
- Do you sometimes feel like staying home from school even if you are not  
sick? (Yes/No)
- Do you ever say anything that makes somebody else feel bad? (Yes/No)
- Are you always polite, even to people who are not very nice? (Yes/No)
- Sometimes do you do things you've been told not to do? (Yes/No)
- Do you always listen to your parents? (Yes/No)
- Do you sometimes wish you could just play around instead of having to go to  
school? (Yes/No)
- Have you ever broken a rule? (Yes/No)
- Do you sometimes feel angry when you don't get your way? (Yes/No)
- Do you sometimes feel like making fun of other people? (Yes/No)
- Do you always do the right things? (Yes/No)
- Are there some times when you don't like to do what your parents tell you?  
(Yes/No)
- Do you sometimes get angry when people don't do what you want them to  
do? (Yes/No)

## Appendix D – Emotional distress scale

Please mark on the scale the number that shows how you are feeling, from 1 (not at all upset) to 10 (very upset)



10  
9  
8  
7  
6  
5  
4  
3  
2  
1

## Appendix E – Example of the catastrophizing interview

Interviewer: Now, I am going to ask you to imagine a situation, and well me what might worry you about it. After each question I am going to ask you to show me how you are feeling on this scale, from 1 (not at all upset) to 10 (very upset). Is that OK?

Interviewer: Imagine that you are about to take a maths test. Imagine that you are feeling very worried about taking the test. What could be worrying you about taking the maths test?

**Participant: I'd probably worry that I won't know the answers [step 1]**

*[Participant or researcher writes this in first bubble on record sheet, and records distress rating].*

Interviewer: What might worry you about not knowing the answers?

**Participant: That I'll get all the answers wrong [step 2]**

*[Participant or researcher writes this in second bubble on record sheet, and records distress rating].*

Interviewer: And what might worry you about getting all the answers wrong?

**Participant: That I might get told off [step 3]**

*[Participant or researcher writes this in third bubble on record sheet, and records distress rating].*

Interviewer: What might be worrying you about being told off?

**Participant: The teacher might send a letter home saying I'd been told off [step 4]**

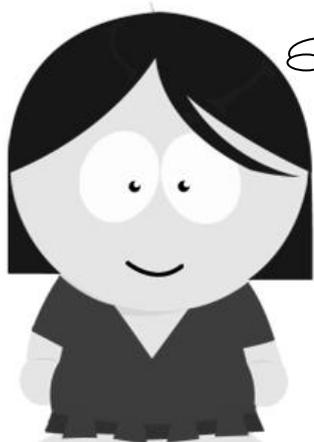
*[Participant or researcher writes this in fourth bubble on record sheet, and records distress rating].*

Interviewer: And what might worry you about a letter being sent home saying you'd been told off?

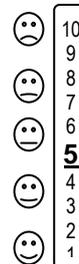
**Participant: I don't know... I don't think my mum would mind, so that wouldn't really worry me**

*[The participant has failed to identify a further worry so this is the end of the catastrophizing interview].*

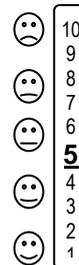
Appendix F – Example of completed catastrophizing interview record sheet



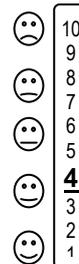
The teacher will send a letter home saying I've been told off



I'll get told off



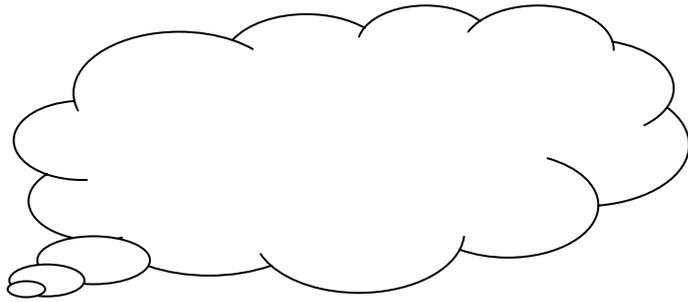
I'll get all the answers wrong



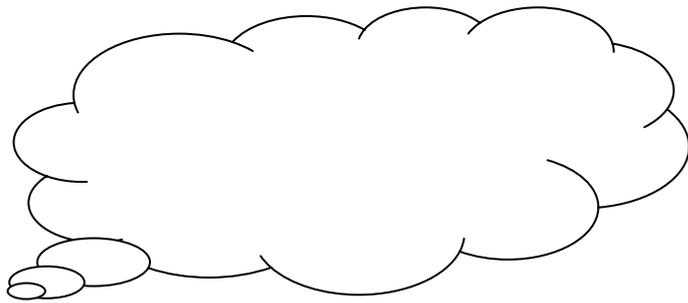
I won't know the answers



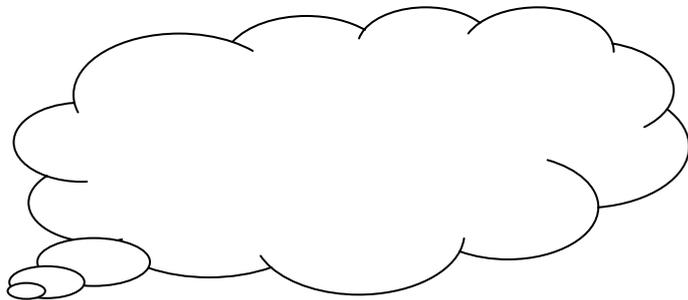
Appendix G – Joe practice item



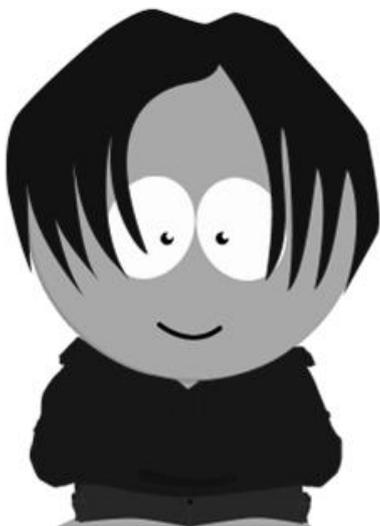
- 10 ☹️
- 9 ☹️
- 8 ☹️
- 7 ☹️
- 6 ☹️
- 5 ☹️
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- 3 ☹️
- 2 ☹️
- 1 ☹️



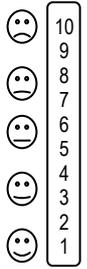
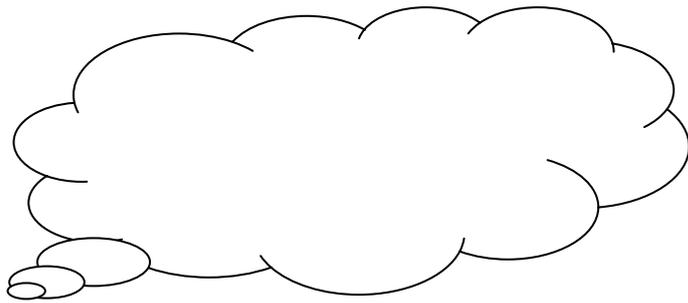
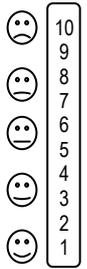
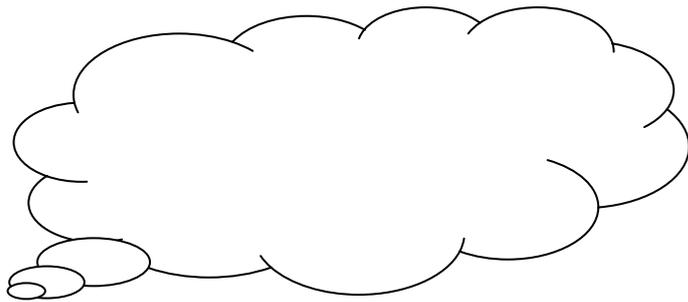
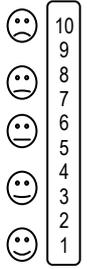
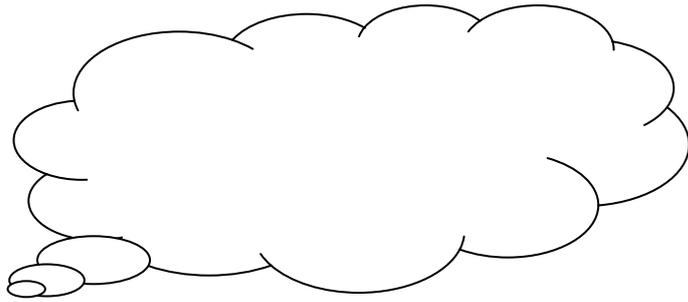
- 10 ☹️
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- 10 ☹️
- 9 ☹️
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- 7 ☹️
- 6 ☹️
- 5 ☹️
- 4 ☹️
- 3 ☹️
- 2 ☹️
- 1 ☹️



## Appendix H – Polly practice item



## Appendix I – Participant information sheet

## Information for young people

I am doing a research project and I would like to invite you to take part. Before you decide I would like you to read the following information. You can ask me as many questions as you like before you decide to take part.

### What is this project about?

I am interested in finding out more about what happens when young people worry.

### Why have I been asked to take part?

This project is interested in young people aged between 9 and 11 years old, which is why you have been asked to take part.

### What would I have to do?

If you and your parents/guardians decide that you would like to take part, this is what will happen:

I will come and see you at school

I will ask you to do a few tasks, including playing some word games and answering some questions about worry.

### Do I have to take part?

You do not have to take part in this project and you can change your mind at any time, without giving a reason.

### Who will know what I said?

Only the people involved in the project will know what you say. If you tell me something that is worrying you then I might share it with your teacher, parents or guardians.

### Will I get anything for taking part?

For every child who agrees to help me with the study, I will donate £5 to your school. This means that you will be helping your school to raise money for books, games, or other equipment. I will also put your name into a prize draw, where you could win up to £20 in WH Smith vouchers. Also, this study will hopefully help people to understand more about young people's worries, which can help other children in the future.

**What now?**

**If you are willing to take part in my study, please ask your parent or guardian to fill in their forms, and return them to your school. I will then visit you at school in the next few weeks to take part in the study.**

**Thank you for your help!**

*Ceara Osleger*

## Appendix J – Participant assent form

Participant Identification Number:

**ASSENT FORM FOR YOUNG PEOPLE**

Title of Project: Understanding worry in children

Name of Researcher: Ceara Osleger, Trainee Clinical Psychologist.

Please tick the box if you  
agree with the statements:

I have read (or had read to me) about this project

I understand what this project is about

I have asked any questions that I have, and been given answers

I know I can stop taking part whenever I want

I am happy to take part

If you do want to take part, please write your name and today's date

Name of child \_\_\_\_\_

Date \_\_\_\_\_

Researcher's Name \_\_\_\_\_

Sign \_\_\_\_\_

Date \_\_\_\_\_

Thank you for your help!

## Appendix K – Parent information sheet

## Parent/Guardian Information Sheet (Version 2, 29/01/10)

I would like to invite your child to take part in a research project. Before you decide, you need to know why I am doing this research and what it will involve. Please take time to read this information carefully to help you decide whether or not you would like your child to take part. Please ask if there is anything that is not clear, or if you would like more information. Thank you for reading this.

### What is this project about?

This research is interested in how we can better understand worry in children. Most children worry at some stage of their childhood, and for some it can become a problem. In this research, I hope to learn more about how children worry, and how we can measure this. This research may contribute towards our understanding of psychological difficulties in children, and how we can help children in distress.

This research is interested in the worries of children aged between 9 and 11 years old, regardless of how much or how often they worry. This is why your child has been invited to take part.

### How will my child and I be involved?

If you decide that you would like your child to take part, this is what will happen:

A convenient time will be arranged for the researcher to meet with your child at their school.

Your child will read an information sheet (also attached to this letter) about the study, and will be asked if they would like to take part.

If you and your child both agree for them to take part in the research, they will be asked to complete a series of tasks. These include word games, short questionnaires and an interview about a worry. These have been designed for children, and your child will hopefully enjoy carrying out these tasks.

Enclosed is a consent form and a short demographic questionnaire for you to complete if you would like your child to take part in the study. Your child can only take part if you return these forms to the school office.

### Are there any risks to my child?

It is not likely that the tasks will cause your child any upset. However, if your child did become upset in any way, the tasks would be stopped immediately. Your child would be comforted, the reason for their distress will be discussed, and their teacher would be notified.

If there was any reason to think that your child was experiencing very high levels of worry from the answers they give in the interview or on the questionnaires, I would contact you and recommend that you contact your GP.

**What are the potential benefits?**

This is an opportunity to get involved in research that could contribute to improving our understanding of psychological difficulties in children. Hopefully, your child will enjoy taking part. Additionally, for every child that participates in the study, a £5 donation will be given to their school. Every child who takes part in the research will also be entered into a prize draw to win either a £20, £10 or £5 WH Smith voucher.

**Will it affect my child's care or education?**

No, your child's care or education will not be affected in any way. This research is being carried out with the permission and co-operation of your child's school.

**Can I change my mind?**

Yes. It is up to you and your child to decide whether or not to take part. You are both free to withdraw from the research at any time, without giving a reason. Your decisions about this will not affect the standard of care your child will receive.

**Who will have access to the results?**

Data management will follow the Data Protection Act. Written records will be kept in a locked cupboard at the University of East Anglia. All children and parents will be identified by unique identity numbers. I will not keep any information about you or your child that could identify you to someone else, other than consent forms (which will be stored separately to the research data).

**Who has reviewed the study?**

The University of East Anglia Faculty of Health Research Ethics Committee has reviewed and approved this research project.

**Who do I speak to if problems arise?**

If there is a problem please let Ceara Osleger (Trainee Clinical Psychologist) or Kiki Mastroyannopoulou (Lecturer in Clinical Psychology) know. You can contact them at the following address:

School of Medicine, Health Policy and Practice  
University of East Anglia  
NORWICH  
NR4 7TJ

Tel 01603 593310

Email: [c.osleger@uea.ac.uk](mailto:c.osleger@uea.ac.uk)

**OK, I am happy for my child to take part – what do I do next?**

Please share the enclosed 'Children's Information Sheet' with your child, to find out if they are interested in taking part. If so, you need to fill in the consent form and demographic questionnaire, and send them back to the

**school office in the envelope provided. I will then arrange a convenient time to meet with your child at school.**

**Thank you for taking the time to read this information sheet. Please do contact me if you have any questions.**

**Ceara Osleger  
Trainee Clinical Psychologist  
University of East Anglia**

Appendix L – Parent consent form

Participant Identification Number:

**PARENT/GUARDIAN CONSENT FORM**

Title of Project: Can the catastrophizing interview technique be used to increase understanding of childhood worry?

Name of Researcher: Ceara Osleger, Trainee Clinical Psychologist.

Please initial box

1. I confirm that I have read and understood the information sheet dated 17/08/09 (Version 1) for the above study. I have had the opportunity to contact the researcher with any questions about the study, and have these answered satisfactorily.

2. I understand that my child's participation is voluntary and that I am free to withdraw my child at any time without giving any reason and without affecting my child's education, medical care or legal rights.

3. I agree that my child may take part in the above study.

Please complete the following:

Name of child ..... Child's date of birth .....

Class ..... Name of school .....

Name of parent/ guardian .....

Signature ..... Date .....

Thank you for your help.

Please return this consent form to the school office in the envelope provided.

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Office use only

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Name of Researcher

---

Date

---

Signature

Appendix M – Ethical approval confirmation letter

Faculty of Health



Ceara Osleger



Research Office, Room 1.09  
Chancellors Drive Annex  
University of East Anglia  
Norwich NR4 7TJ  
United Kingdom  
Email: Jane.Carter@uea.ac.uk  
Tel: +44 (0) 1603 591023  
Fax: +44 (0) 1603 591132  
Web: www.uea.ac.uk  
Web: http://www.uea.ac.uk

12 November 2011

Dear Ceara

**Project title: Can the catastrophizing interview technique be used to develop understanding of childhood worry? - 2009/10-002**

The amendments to your above proposal have now been considered by the Chair of the FOH Ethics Committee and we can now confirm that your proposal has been approved.

Please could you ensure that any amendments to either the protocol or documents submitted are notified to us in advance and also that any adverse events which occur during your project are reported to the committee. Please could you also arrange to send us a report once your project is completed.

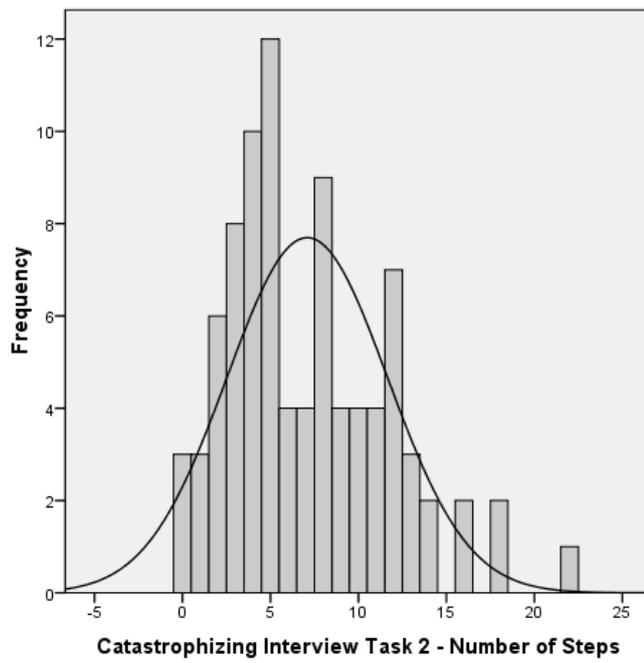
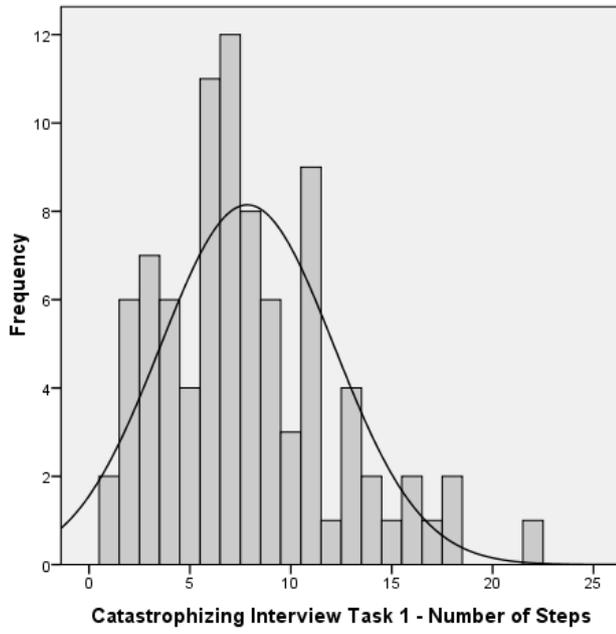
The committee would like to wish you good luck with your project.

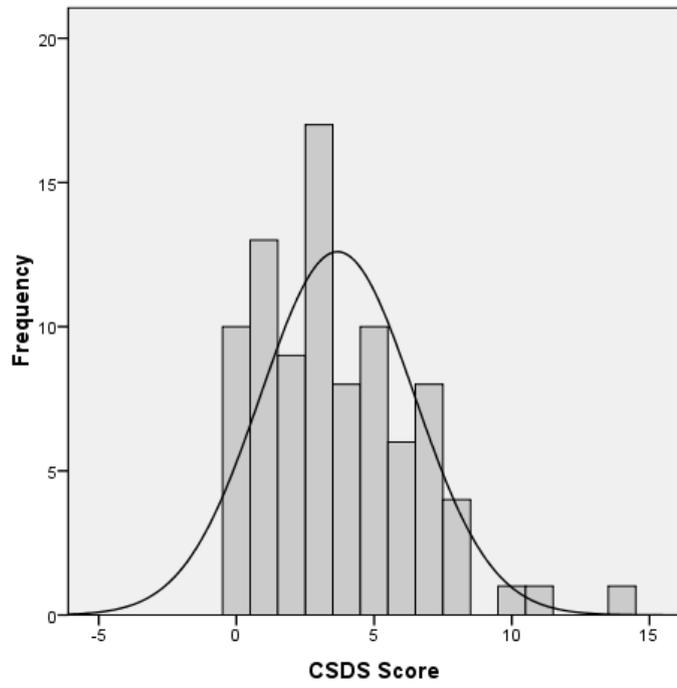
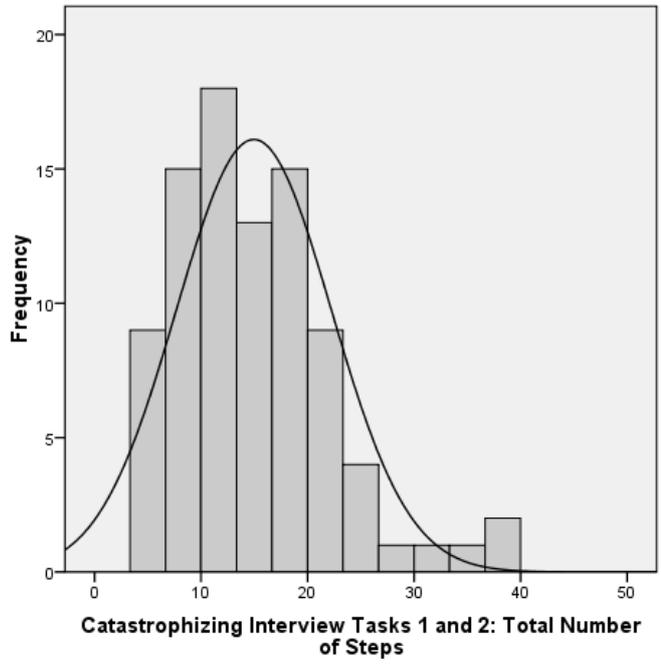
Yours sincerely,

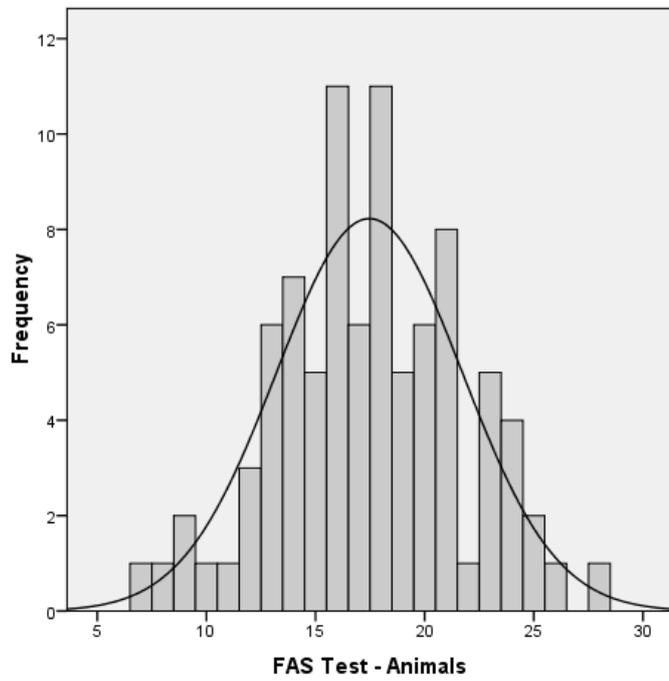
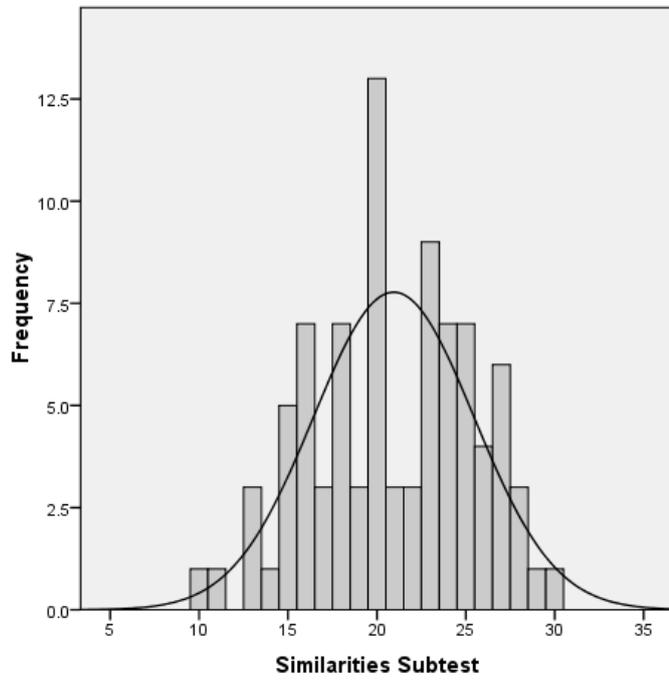
A handwritten signature in cursive script that reads 'Jane Carter'.

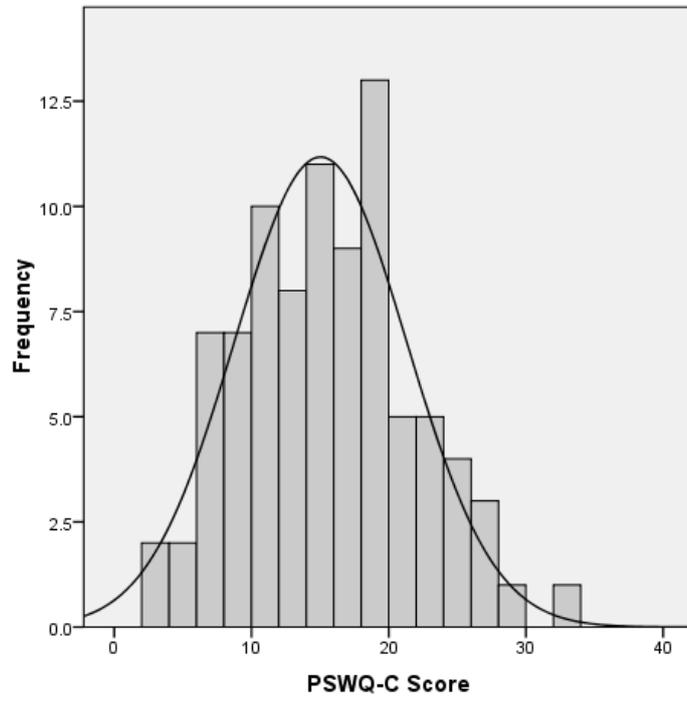
Jane Carter

## Appendix N – Histograms of the main variables

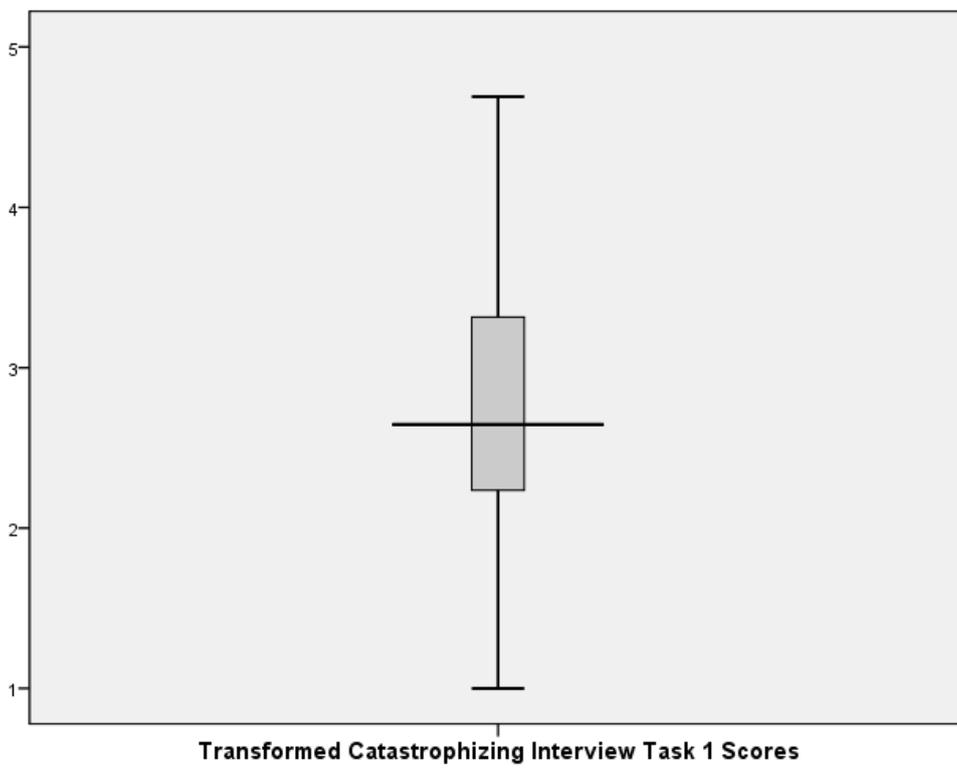
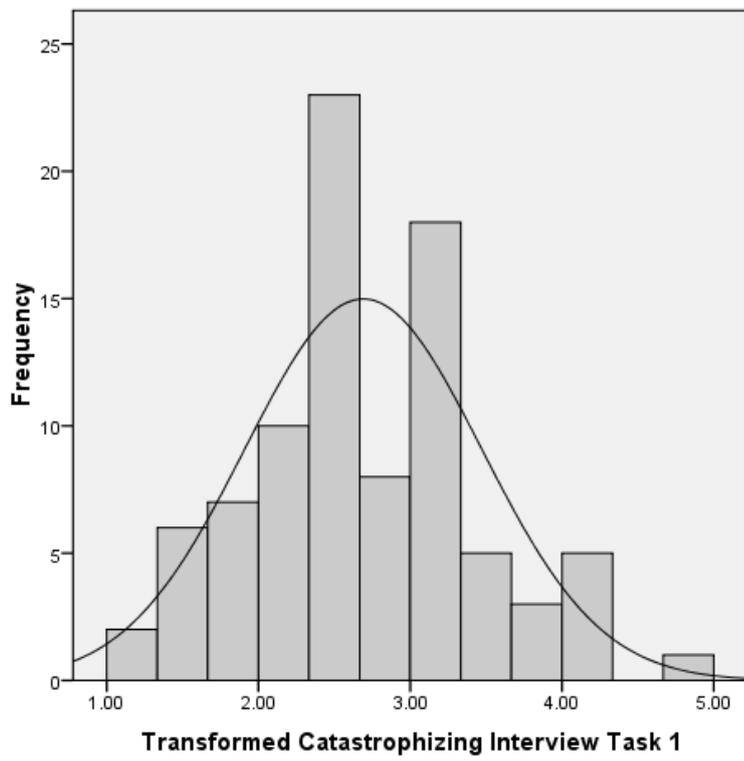


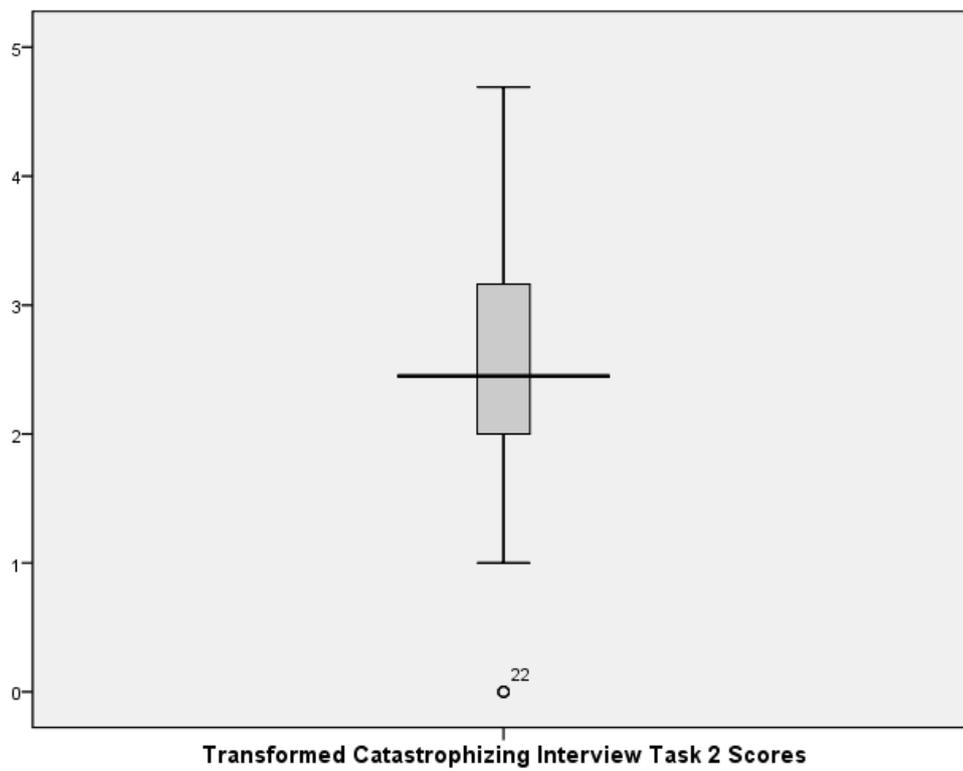
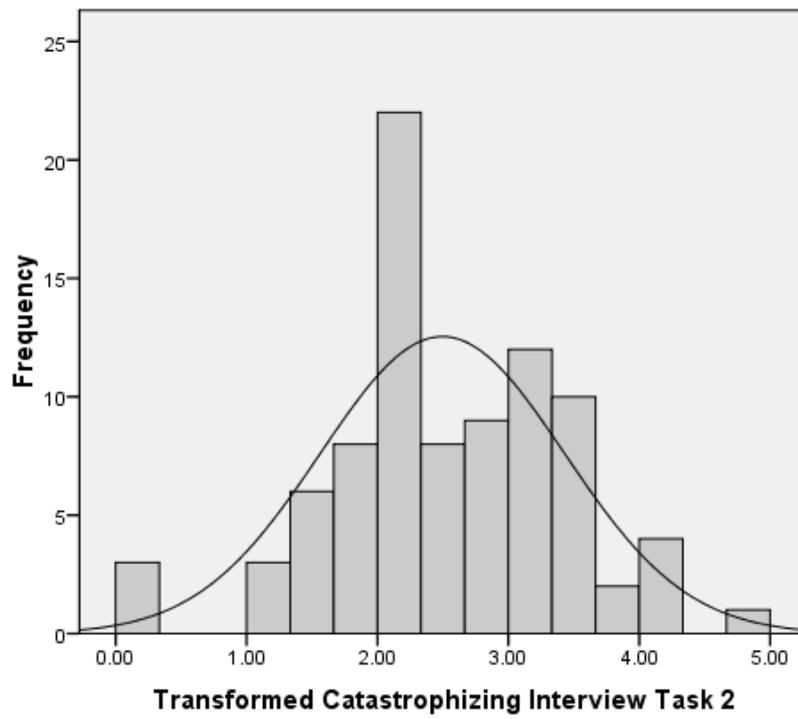


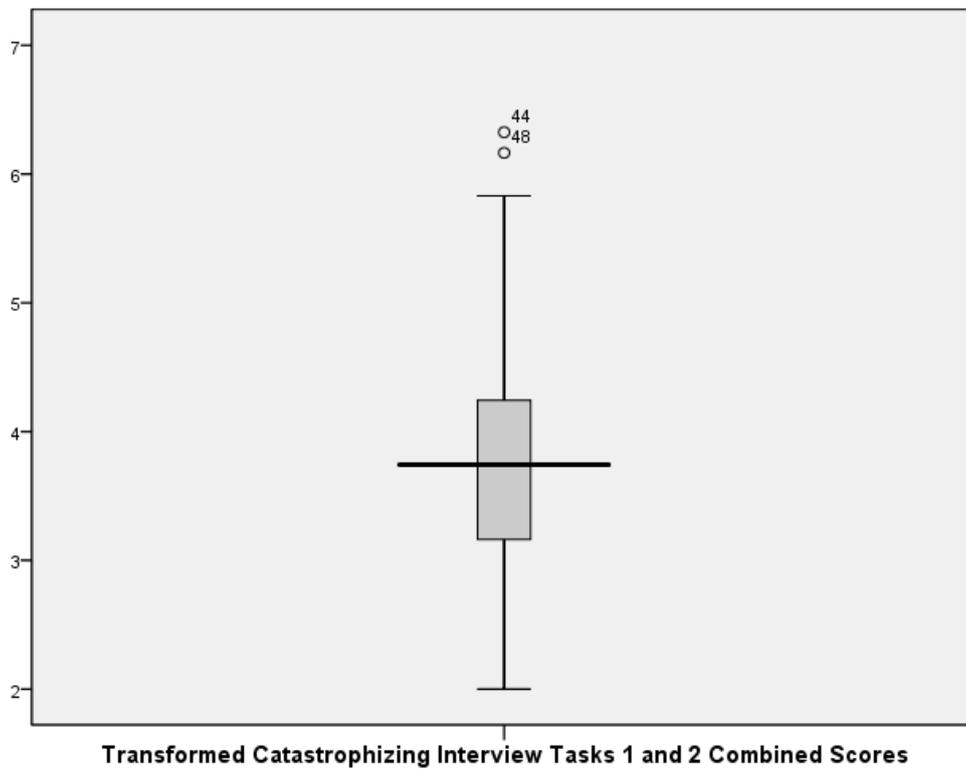
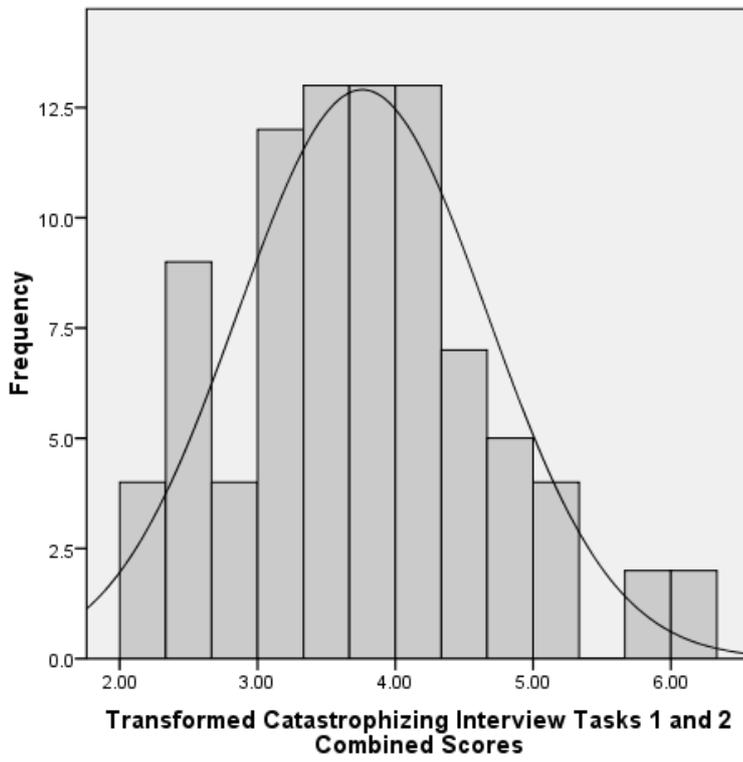


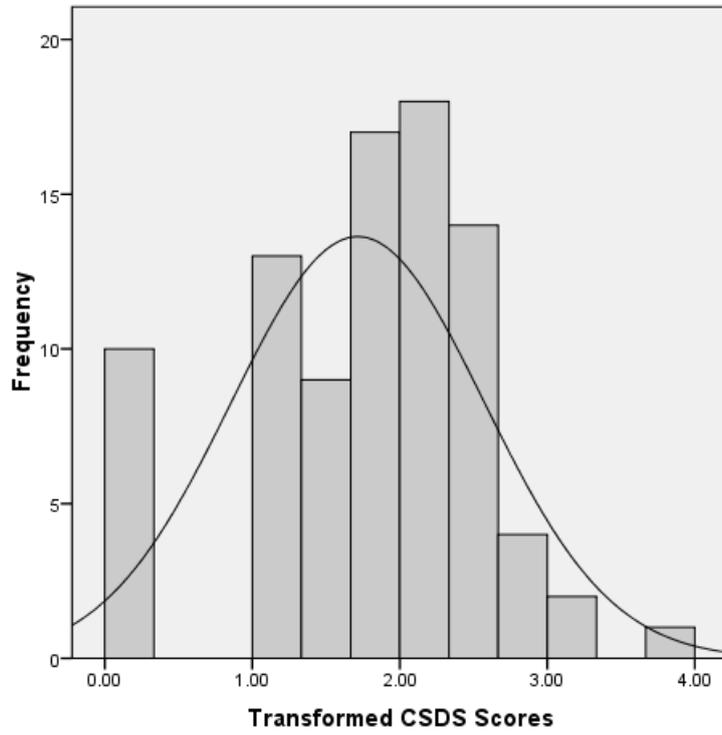


## Appendix O – Histograms and box plots of transformed data

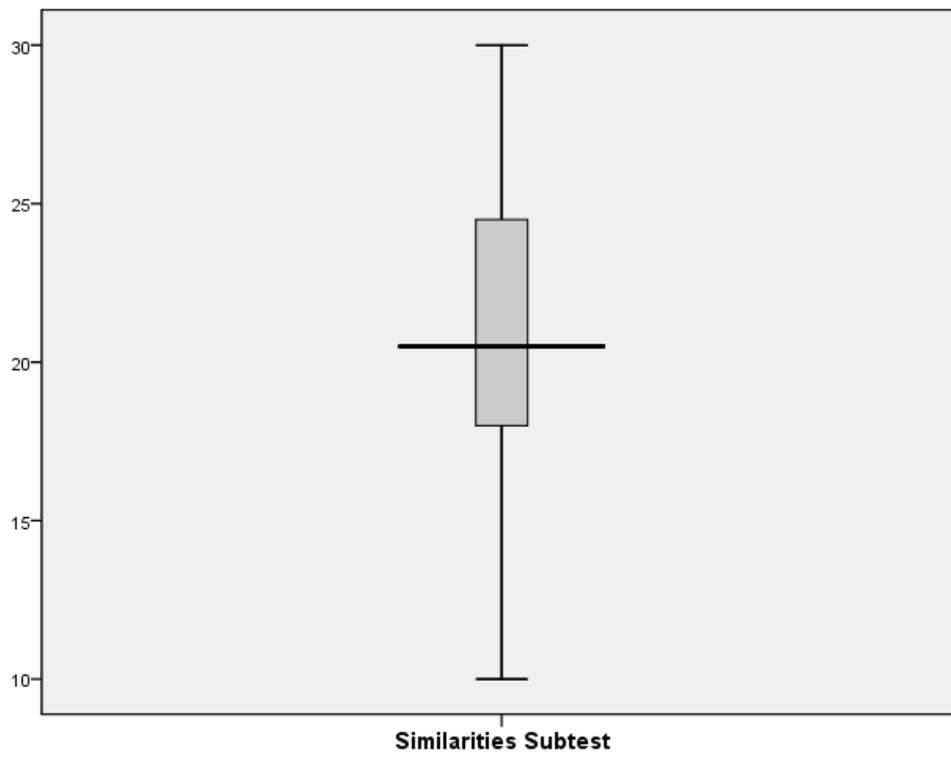
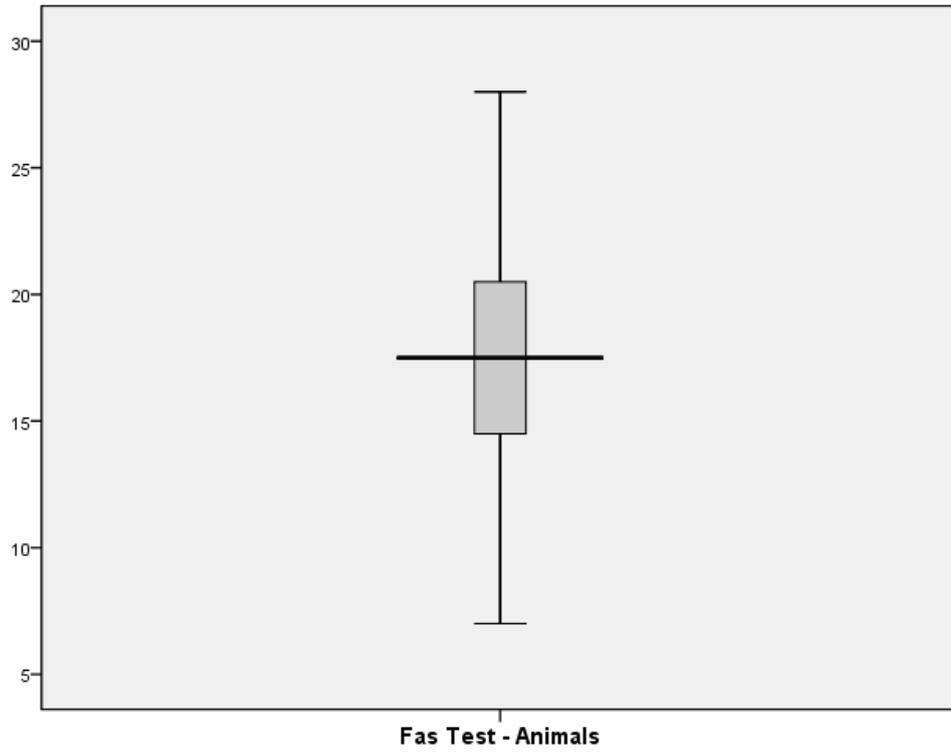


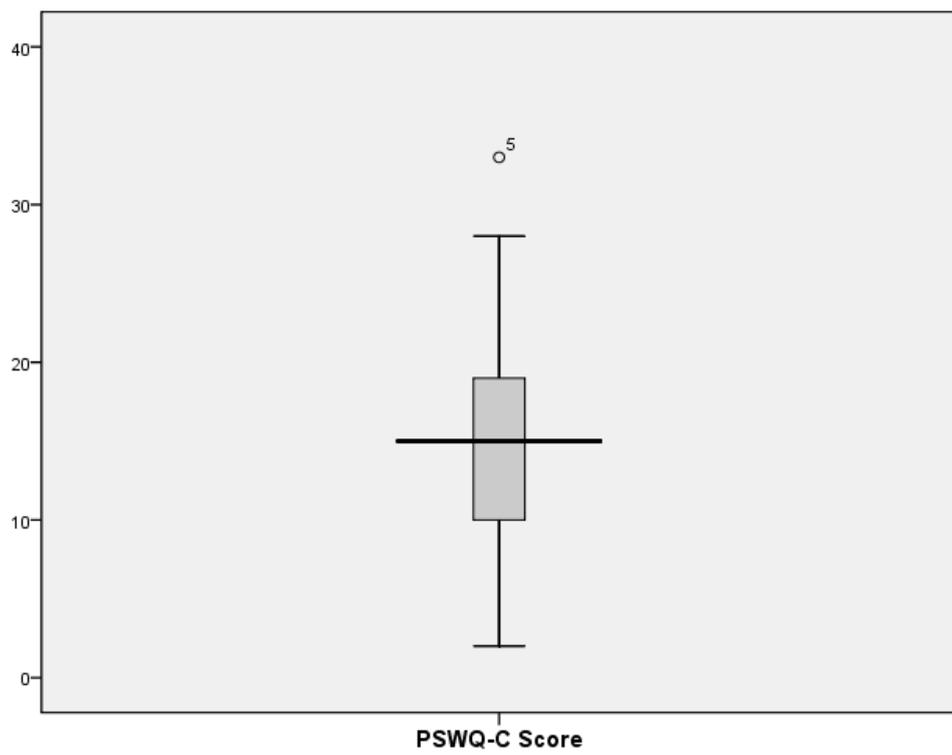
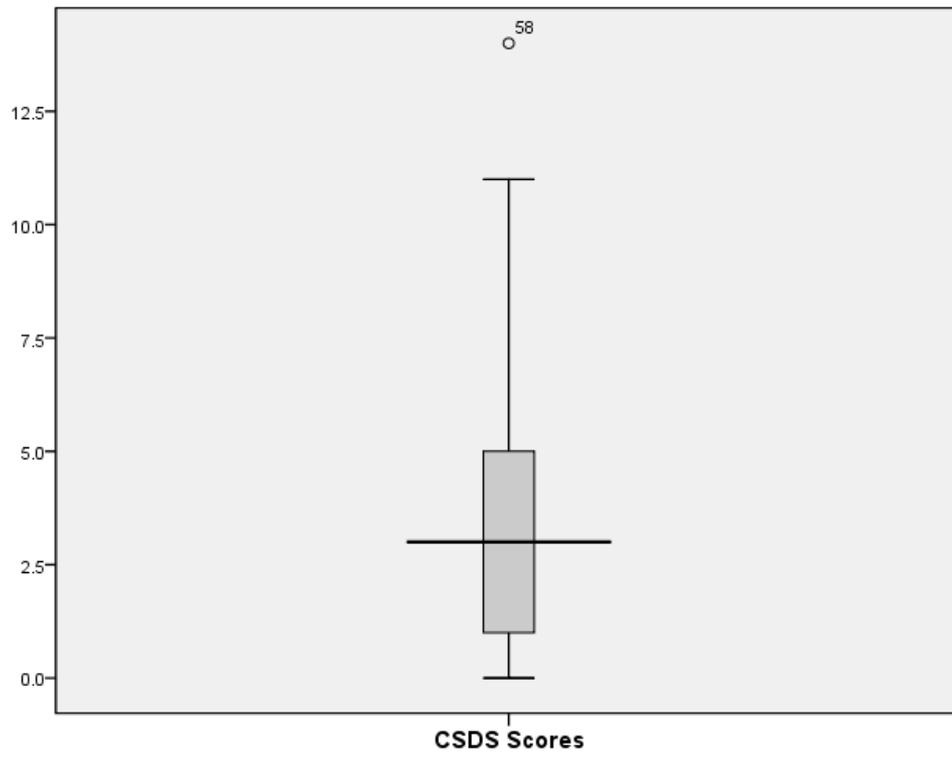


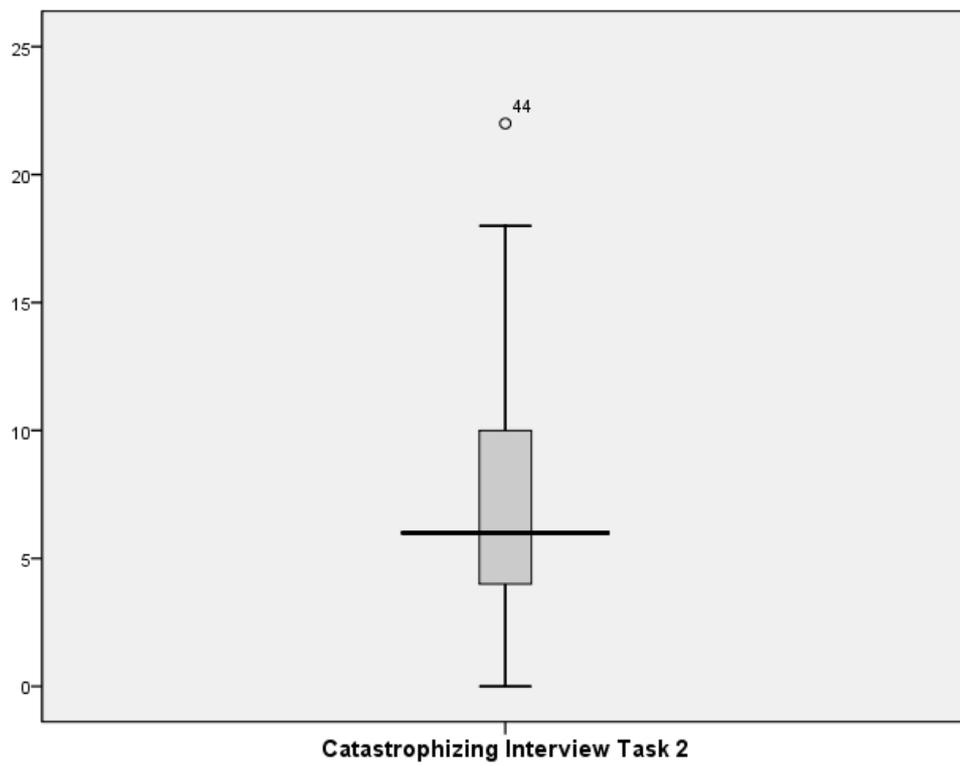


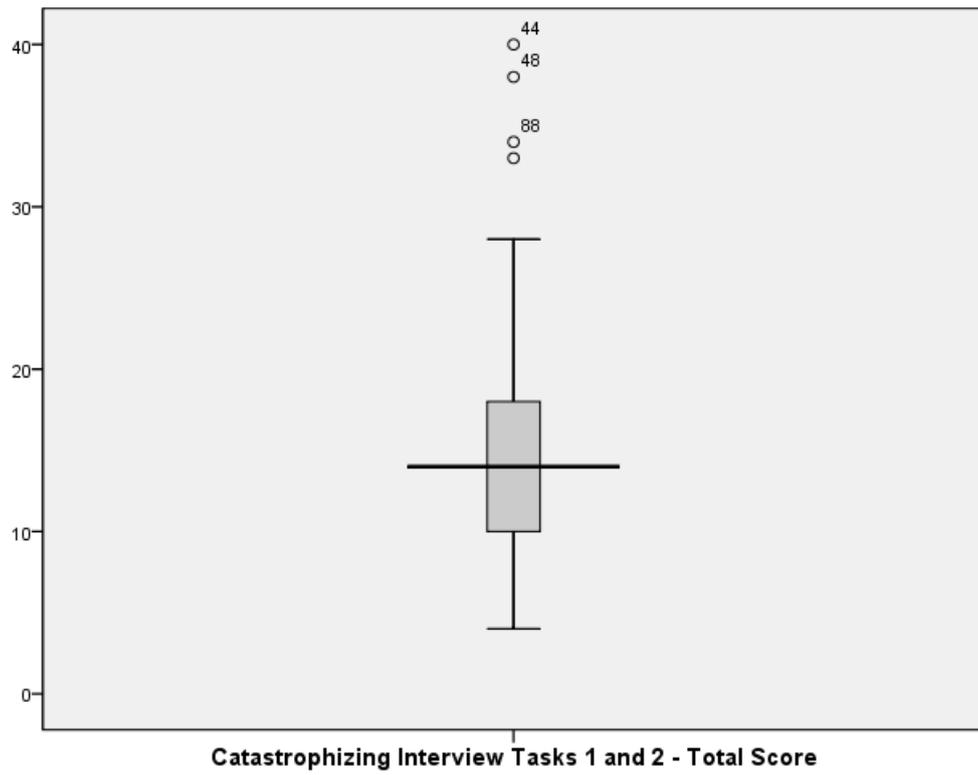


## Appendix P – Box plots of distribution of main variables









## Appendix Q – Example of coding for qualitative content analysis

Participant 66

Scenario 1: Imagine that your teacher tells you that you have to give a five-minute talk to the rest of your class. Imagine that you are feeling very worried about giving the talk. What could be worrying you about giving the talk?

		<b>Coding</b>
Step 1	If people laugh	<b>Standard - social</b>
Step 2	Make me feel embarrassed	<b>Standard - personal</b>
Step 3	People will make fun of me	<b>Standard - social</b>
Step 4	I wouldn't get any friends	<b>Standard - social</b>
Step 5	I wouldn't enjoy school	<b>Standard - academic</b>
Step 6	I wouldn't go [to school]	<b>Extreme - academic</b>
Step 7	I wouldn't learn	<b>Extreme - academic</b>
Step 8	I wouldn't get a good job	<b>Long-term - career</b>
Step 9	I would be lonely all the time	<b>Long-term - social</b>
Step 10	When I get old no-one could help [me]	<b>Long-term - social</b>
Step 11	I would not be well	<b>Long-term - health</b>
Step 12	I'd die!	<b>Long-term – health</b>