Anxiety and Cognition in Children and Adolescents

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Statement

This thesis contains no material which has been accepted for the award of any other degree or diploma in any tertiary institution, and to the best of my knowledge and belief, contains no material previously written or published by another person, except where due reference is made in the text of this thesis.

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Abstract

The link between distorted thinking and anxiety in children and adolescents has long been established; however, there have been few studies which address gender differences or the effect of age on anxiety and cognition. The major aims of the thesis are to investigate age (via grade) and gender differences in the anxiety-induced cognitive output of children and adolescents, and to assess the effect of positive statements, coping statements and threat statements on state anxiety. To this end, a number of hypotheses are explored involving children from different grade levels in a series of four experiments. First it is hypothesised that there will be increases in the number of anxiety-induced cognitions as grade increases. Second, females will report significantly more coping and threat statements and significantly less positive statements. Third, that trait anxiety will be significantly positively correlated with coping and threat statements, and in addition, the relationship between positive cognitions and anxiety will be explored. Fourth it is hypothesised that those presented with positive statements will report significantly less state anxiety than those presented with coping or threat statements.

It has been demonstrated that there are developmental changes in the presentation and intensity of children's fears, and previous research in the area has not controlled for these differences in selecting stimuli items to induce anxiety. Experiment 1 selected three fear items to be used to induce anxiety in later experiments which control for age differences. The Fear Survey Schedule for Children-II (FSSC-II; Gullone & King, 1992a) and the State Trait Anxiety Inventory (STAI; Spielberger, 1983) or the State Trait Anxiety Inventory for

Children (STAIC; Spielberger 1973) were administered to 311 children from grades 3, 4, 5, 7 and 10. The selected items did not display significant effects of grade, were significantly positively correlated with trait anxiety and they were reported with notable levels of fear. It was not possible to select items that did not show gender differences because the majority of items were feared significantly more by females. The final selected items were 'having no friends', 'having an operation' and 'sharks'.

The second experiment developed these items into imagery scenarios which were presented to 121 children in grades 3, 5, 7 and 10. Resultant cognitions were measured using the think-aloud method, and state anxiety was assessed. Trait anxiety was also measured using the STAI or STAIC and the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985). The scenarios induced equivalent levels of state anxiety across the grades, thus providing an adequate basis for comparing reported cognitions across the grades. Females reported significantly higher levels of state anxiety in response to the 'having no friends' and 'having an operation' scenarios. While internal threat statements, external threat statements, coping statements and positive statements were evident across all grades, there was no evidence to suggest that the levels of these cognitions varied across the grades. Coping statements and threat statements were positively correlated with measures of anxiety. It was noted that threat cognitions were reported at the highest rates, and positive statements at the lowest rates. Coping statements varied the most between scenarios, and this probably reflects the level of control that the individual has over the imagined situation.

In experiment 3 cognitions selected from experiment 2 were used to develop four different conditions of the operation scenario. Each of the four conditions of the operation scenario contained one of the four categories of self talk investigated in experiment 2, and these were presented to a total of 311 participants in grades 3, 5, 7 and 10. Reported cognitions were measured on a checklist which consisted of the cognitions contained in each of the four conditions. It was hypothesised that those given the positive statements condition would report significantly lower levels of state anxiety than those given the other three conditions. Results supported this hypothesis. It was noted that females displayed greater reactivity to the scenarios in all cases, evidenced by significantly higher induced levels of state anxiety despite equivalent levels of baseline state anxiety. State anxiety did not remain consistent across the grades, but increased in grade 5, representing an inverted 'U' developmental pattern. Levels of reported cognitions were consistent with the imagery condition which had been presented to participants. Reported cognitions also displayed an inverted 'U' developmental pattern, with participants in grade 5 reporting higher levels of anxiety-related cognitions than those in other grades. Coping and threat statements correlated positively with both state and trait anxiety. Positive statements were negatively correlated with state anxiety but not trait anxiety.

The final experiment aimed to replicate the findings of experiment 3 and to generalise these findings to the friends and shark scenarios. This experiment indicates that while those given the positive statements condition did report significantly less state anxiety than those given the other conditions, this effect

was limited to grade 3 participants, demonstrating that the positive statements were only effective in reducing state anxiety with this younger group of participants. There was no evidence of the inverted 'U' developmental profile of state anxiety. There was no consistent developmental pattern associated with reported cognitions, however reported cognitions were consistent with presentation condition as in experiment 3. The finding of greater reactivity to the anxiety-inducing scenarios by females was replicated in this experiment.

This investigation suggests there are few consistent developmental trends related to reported cognition, but that threat statements, coping statements and positive statements are all implicated in anxiety at some level. While the role of positive statements in trait anxiety is limited there is evidence to suggest that positive statements reduce state anxiety and the effect is more pronounced in grade 3 participants. Although there were no differences in baseline state anxiety, females consistently reported higher levels of state anxiety in response to the scenarios. The theoretical and methodological implications of these findings are considered.

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Chapter 1: Introduction

Anxiety is one of the most common psychological conditions experienced by children. Anxiety has been found in 21% of children based on self report (Kashani, Orvaschel, Rosenberg, & Reid, 1989). Anxiety is a multifaceted condition with symptoms found in the affective, physiological, behavioural and cognitive domains. Psychologists are beginning to recognise the importance of the cognitive aspects of anxiety, and this is reflected by the inclusion of worry as one of the central diagnostic criteria for generalised anxiety disorder in the Diagnostic and Statistical Manual of Mental Disorders (fourth edition, 1994) (DSM-IV). Cognition, self talk or internal speech are all terms referring to the dialogue which individuals continually carry on in their own minds. To measure such activity is one challenge, to understand it is to begin to uncover one of the central aspects of the human condition. The cognitive aspects of anxiety in children are only beginning to be understood.

The study of any psychological condition in children must take into account the basic nature of children: That they are not a homogenous group and they are a group which is constantly changing and becoming more complex on the journey into adulthood. Research clearly demonstrates that there are significant changes in the fears of children as they grow older (e.g., Gullone & King, 1992b; Ollendick & King, 1991). Anxiety and fear are closely related, and yet there have been few studies which attempt to take into account the role of age in anxiety and cognition in children. Likewise for gender. Research has shown that females are more likely to report higher levels of anxiety than males, and yet has failed to address directly gender differences in cognition. The thesis investigates anxiety and cognition in children with particular reference to age and gender.

The role of cognition in childhood anxiety has been investigated since the 1980's (e.g., Fox, Houston, & Pittner, 1983; Houston, Fox, & Forbes, 1984; Zatz & Chassin, 1983, 1985). Many of the studies of this era used test situations as a means of inducing anxiety for the investigation of cognitive activity. It was one of the few ways in which anxiety could be induced in an ethically acceptable manner. Other studies used situations like jumping off a diving board (Prins, 1986), or required children to report what they would think in given situations such as giving a talk in front of the class (e.g., Brown, O'Keeffe, Sanders, & Baker, 1986). What these studies all had in common was that they paid no heed to the fact that children's fears of different situations vary as a function of age. For example, research shows that talking in front of the class would be considered a socially demanding situation, and situations such as these are more commonly feared in older children than young children (Gullone & King, 1992b). So, it is likely that the cognitive responses of children to such situations will also vary as a function of their fear of the situation. Findings from studies such as these are therefore limited in their applicability to different age groups. Studies are needed that choose stimuli which control for these age variations in fear.

It was noted earlier that many studies use test situations to induce anxiety. The research findings regarding anxiety-related cognitions in children are therefore biased toward such a context. It is not clear how easily the findings relating to test anxiety can be generalised to different situations. Much of this early research suggests that coping thoughts are commonly reported in children experiencing test anxiety (Prins, Groot, & Hanewald, 1994; Zatz & Chassin, 1985). It is likely that coping thoughts are an appropriate response to test anxiety, as they help the individual to deal with the situation. A situation where active coping is not required however, such as going to the dentist, may not promote such coping thoughts. Research in this area would be well served by broadening its scope and including research into a wider range of anxiety-inducing situations. One of the problems with broadening the range of anxiety-inducing situations in research is that there are considerable ethical problems with exposing children to in vivo anxiety-inducing situations. Davison, Robins, and Johnson, (1983) and later Davison, Navarre, and Vogel (1995) induced anxiety in adults using imagery. This method has not been applied to children; however, imagery has been found to induce anxiety responses in children in related studies (Hermecz & Melamed, 1984). Such a method opens up a range of opportunities for inducing anxiety in children and adolescents.

The thesis reports an investigation of anxiety and cognition in children with particular reference to the influences of age and gender. In this investigation imagery is used to induce anxiety in a range of situations which have not been included in past studies.

Chapter 2: An Overview of Anxiety in Children

Anxiety is a psychological condition experienced at the affective, behavioural, physiological, and cognitive levels. It is commonly understood to entail fearful affect, avoidant behaviour, increased physiological responsiveness and threatening cognitions. This chapter will cover issues in the diagnosis of anxiety in children, followed by presentation of a theoretical background to understanding anxiety, which emphasises the role of negative affectivity in anxiety. Issues such as the relationship between anxiety and fear, and the relationship of anxiety with depression and self esteem will also be considered. This information will serve as a background for the discussion of the cognitive aspects of anxiety which will be covered in the following chapter.

Anxiety as a diagnosable condition

Anxiety in both children and adults is traditionally understood in terms of distinct diagnostic categories. The most common anxiety disorders diagnosed in children include separation anxiety disorder, specific phobias, social phobia, obsessive compulsive disorder, post traumatic stress disorder, acute stress disorder, and generalised anxiety disorder (formerly overanxious disorder of childhood) (DSM-IV, 1994). Prevalence rates for specific anxiety disorders vary, but it is believed that separation anxiety disorder alone reaches a prevalence rate of 4% in children and adolescents (DSM-IV, 1994). Specific anxiety disorders can also vary in prevalence as a function of age. For example, the onset of separation anxiety disorder is more common in middle childhood, while specific phobias of animals tend to be most common in early childhood (DSM-IV, 1994). Gender also plays an important role in the anxiety disorders. Separation anxiety disorder, social phobia, specific phobia and generalised anxiety disorder are more common in females than males, while obsessive compulsive disorder is equally represented in males and females (DSM-IV, 1994).

Although such a diagnostic classification system has been in common use in diagnosing specific anxiety disorders in children for some time now (including previous editions of the DSM), there have been difficulties with the system. Lucas (1993) suggested that there is considerable diagnostic overlap between the various types of anxiety disorders. Clark and Watson (1991) argued that there is sufficient evidence to support the inclusion of a mixed anxiety/depression category within such a diagnostic system, because of the overlap between these two conditions. Lucas (1993) also argued that the impact of developmental factors has not been adequately integrated into the DSM diagnostic system, so it may have limited validity in assessing anxiety disorders across the age range in children.

Kashani, Orvaschel, Rosenberg, and Reid (1989) assessed various categories of psychopathology in a community sample of children and found anxiety to be the most frequently reported category, reaching 21% based on child-report and 14.1% based on parent-report. Separation anxiety symptoms decreased with age, while some specific fears, including social embarrassment, increased with age. These results suggest that while the level of anxiety remains relatively unchanged across the age range, there are age-related differences in various categories of anxiety. Kashani et al. (1989) reported that the focus of anxiety changes from the family in early and middle childhood to social situations and peer relations as children reach adolescence. Males showed lower levels of anxiety symptoms than females, although the two groups showed similar patterns of anxiety over time. Females in Kashani et al.'s (1989) study showed an increase in concerns regarding their own adequacy as they increased in age. Girls also reported greater levels of panic disorder symptomatology, separation disorder symptomatology, and specific phobia (Muris, Merckelbach, Mayer, & Meesters, 1998). These results support the argument that gender and developmental factors play an important role in the anxiety symptoms of children (Lucas, 1993) and that consideration should be given to age and gender when researching anxiety in children.

State and trait anxiety

Theoretically, anxiety is viewed as a condition which is manifested at the trait and state level (Cattell & Scheier 1961; Spielberger, 1966). Trait anxiety refers to the enduring personality trait of anxiety, which predisposes a person to view the world and react in a predictable manner (Spielberger, 1983). Watson and Clark (1984) suggested that trait anxiety can be conceptualised as a manifestation of negative affectivity. They argued that those with a high negative affectivity disposition experience negative emotional states such as worry, tension and nervousness, and are likely to be distressed, upset and have lower self esteem while those with a low negative affectivity disposition are likely to feel calm and relaxed. In addition, and perhaps more importantly, they argued that negative affectivity is unrelated to the experience of positive emotions, so an individual high in negative affectivity can still experience positive emotions such as joy and excitement. Their argument suggested that anxiety is related to high negative affectivity, but unrelated to positive affectivity. They described positive affectivity as the tendency to feel either active, excited, alert, enthusiastic and strong or fatigued, sluggish and drowsy (Clark & Watson, 1991; Watson & Clark, 1984). Issues related to anxiety and positive affectivity will be addressed in more detail later.

Spielberger (1983) reported that individuals who are high in trait anxiety are more likely to respond with greater increases in state anxiety where the threat involves interpersonal relationships and threat to self esteem while, they are less likely to respond in this way to physical dangers (Hodges & Spielberger, 1966) or imminent surgery (Auerbach, 1973; Martinez-Urrutia, 1975). Hodges and Spielberger (1966) measured heart rate (as an indicator of state anxiety) in response to the threat of shock, and reported no interaction between trait anxiety level and measurement time (that is, before and after threat of shock). These findings suggest that state anxiety is not differentially affected by trait anxiety level. Auerbach (1973) reported that while state anxiety scores both pre- and post-operatively were higher for high trait anxious individuals, state anxiety is not differentially affected by the individual's level of trait anxiety. Similarly, Martinez-Urrutia (1975) reported no difference in the magnitude of participants' state anxiety response as a function of trait anxiety level. It is important that the relationship between state anxiety and trait anxiety is investigated, to establish whether children of high trait anxiety display differentially high state anxiety.

Houston, Fox, and Forbes (1984) investigated state anxiety in a test situation, but did not find the predicted differential increase in high trait anxious children's state anxiety. This may be because they took initial measures of state anxiety during an anticipation period rather than at baseline. Interestingly, Houston et al. (1984) reported that the performance of high trait anxious but not low trait anxious children is affected by the manipulated level of stress. This research is consistent with the research on self-esteem and anxiety to be discussed later in this chapter, which suggests that interpersonal factors play a crucial role in anxiety. For example, Matthews and Odom (1989) reported that state anxiety was more highly correlated with self esteem than trait anxiety. This research is also consistent with the work of Friedman, Campbell, and Okifuji (1991), who reported that fear of failure and criticism was the best predictor of self reports of anxiety symptoms in children aged between 6 and 11 years of age.

State anxiety refers to a transitory anxiety state or reaction to certain stimuli. Spielberger (1983) argued that the stronger the trait anxiety of an individual, the more likely he or she is to experience intense elevations in response to a threatening situation. So greater levels of trait anxiety increase an individual's susceptibility to higher levels of state anxiety. The most common measure of state anxiety is Spielberger's (1983) State Trait Anxiety Inventory (STAI) and the parallel children's version, the State Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973). Watson and Clark (1984) suggested that an individual high in negative affectivity will be more likely to experience elevations in transient or state negative affectivity at all times, regardless of whether there is a direct threat at the time. They investigated the construction of the STAI state scale, and reported that state anxiety is not a pure measure of transient negative affectivity, but measures a more general happiness/ unhappiness dimension, and is related to pure measures of both positive affect and negative affect. They explained that this is confirmed by the construction of the state anxiety scale which includes items which may be seen to reflect both negative affectivity (for example, jittery, nervous and upset as well as relaxed and calm) and more general happiness/ unhappiness items (for example, joyful and content as well as regretful).

A number of researchers have investigated the STAIC using a factor analytic approach. Papay and Hedl (1978) administered the STAIC to 1522 grade 3 and 4 children and reported a three factor solution. This solution consisted of a trait anxiety factor, and two state anxiety factors, which they name 'anxiety absent' and 'anxiety present'. Similarly, Dorr (1981) reported the same factor structure with the STAIC administered to 644 grade 5 and 6 students. Cross and Huberty (1993) developed this line of research further in a more recent study, which assessed the factor structure of the STAIC using principal components analysis on data from 541 grade 7 and 8 children. They found the same factor structure as the earlier studies (Dorr, 1981; Papay & Hedl, 1978), but the authors in this study choose to call the two state factors 'state unhappiness' and 'state distress', which correspond to the positively and negatively valenced items of the state anxiety scale.

The findings of Cross and Huberty (1993) and others (Dorr, 1981; Papay & Hedl 1978) reveal that there are two independent factors within the state scale of the

STAIC. These two factors consist of the positive and negative items on the state scale. The results of these studies appear inconsistent with Watson and Clark's (1984) explanation of the construction of the STAI state scale. Watson and Clark (1984) argue that items such as 'tense' and 'calm' both reflect negative affectivity, while items such as 'happy', and 'pleasant' both measure a general unhappiness construct. The factor analytic studies are not consistent with these conceptions of positive affectivity and negative affectivity.

Cross and Huberty (1993) further investigated the relationships between the three factors of the STAIC. Correlational analyses revealed that trait anxiety (or negative affectivity) was more highly correlated with state distress than with state unhappiness, and the highest correlation (r=+0.49) was found between state unhappiness and state distress. A regression analysis of state unhappiness and state distress revealed that there was little relationship until unhappiness increased beyond its mean, and then the slope of state distress increased rapidly, suggesting that the factors are not independent of each other at higher levels of unhappiness. The important conclusion here is that state anxiety is a bi-dimensional measure, and that the relationship between the two measures is not completely linear. Research into anxiety in children and adults does not appear to take this into account when measuring state anxiety. As discussed in the following chapters, many researchers have used the state scales of the STAI and STAIC as a pure measure of state negative affectivity.

Another important consideration in understanding the utility of the STAIC in children is that state anxiety may be differentially affected by stressors at different ages. Reed, Carter, and Miller (1992) pointed out that there are many age specific fears which will impact on children's experience of state anxiety which will be addressed more fully later in this chapter. Researchers do not appear to have addressed adequately the issue of differences in the magnitude of state anxiety according to qualitatively different threatening situations. It is therefore important that investigations of state and trait anxiety in children use stimuli that are not age specific, as age specific stimuli may simply reflect natural age-related fluctuations in state anxiety.

In sum, anxiety can be understood as a condition manifested at the state and trait level. Trait anxiety is characterised by high levels of negative affect, but is unrelated to positive affect. Anxiety is further characterised by elevated physiological arousal. Anxiety can be differentiated from depression on the basis of these factors. Depression is also characterised by high negative affectivity, but also includes low levels of positive affectivity. State anxiety is usually measured by the STAIC and STAI state anxiety scale, which includes positive and negative items which consistently fall into two separate factors (Cross & Huberty, 1993; Dorr, 1981; Papay & Hedl, 1978). Watson and Clark (1984) suggest that the items of the STAI state anxiety scale do fall into positive affect and negative affect items, but their description of this breakdown does not fit with the factor analytic studies. It is possible that these factors represent positive and negative affectivity respectively, but this has not been empirically tested.

The differentiation between anxiety and depression

There has been debate over whether anxiety and depression are completely distinct syndromes, or whether they represent different presentations of the one underlying trait, referred to as neuroticism, general psychological distress, internalising disorder (Brady & Kendall, 1992) or negative affectivity (Watson & Clark, 1984). As previously discussed, negative affectivity is described by Watson and Clark (1984) as a stable trait which predisposes people to experience discomfort across the whole range of times and situations, even in the absence of a stressor. People with high negative affectivity also tend towards negative introspection and world view. Clark and Watson (1991) proposed a tripartite model of anxiety and depression, which states that both anxiety and depression are characterised by high levels of negative affectivity, but that depression is additionally characterised by the absence of positive affectivity (or anhedonia), and anxiety is additionally characterised by physiological hyper-arousal.

Angold and Costello (1993) reviewed epidemiological studies of co-morbidity of depression and anxiety disorders in children. Their findings reveal that co-morbidity of these two disorders ranges from 30% to 75%. They also report that anxiety is more common in depressed than non-depressed individuals. Kovacs, Gatsonis, Paulauskas, and Richards (1989) reported that 41% of 104 children referred to a psychiatric clinic received a diagnosis of both anxiety and depression. They reported that a secondary diagnosis of anxiety was more likely in those children with a diagnosis of major depression or dysthymic disorder rather than adjustment disorder with depressed mood. They also suggested that anxiety disorders in depressed children are likely to be more common than they are in the general population. In an investigation of co-morbidity of anxiety and depression in children, Strauss, Last, Hersen, and Kazdin (1988) reported that 28% of those children receiving a DSM-III diagnosis of anxiety also displayed major depression. This group of children with both disorders was older and displayed more severe anxiety symptomatology.

Joiner and Blalock (1995) addressed the issue of gender differences in depression according to Clark and Watson's (1991) tripartite model of anxiety and depression. Joiner and Blalock (1995) suggested that differences in the rates of diagnosis are related to levels of positive affect. Groups given a diagnosis of specific depression (characterised by anhedonia, few or no symptoms of physiological arousal and high negative affectivity), specific anxiety (characterised by no indication of anhedonia, but elevated levels of physiological arousal and negative affectivity), co-morbid depression and anxiety (characterised by elevated anhedonia, physiological arousal and negative affectivity), and mixed anxiety-depression (characterised by elevated negative affectivity without indication of elevated physiological arousal or anhedonia) were investigated. The study reported that co-morbid anxiety and depression and mixed anxiety-depression were more common in women than men, but that specific anxiety and depression were equally common in men and women.

Self report measures are probably the most common means of anxiety symptom assessment in children. While there can be difficulties in using self report data, as Crowley and Emerson (1996) point out, assessment of a child's internal states by an external observer must be limited, so self report is the only way in which to measure children's experiences of anxiety. Self report measures are also a quick and convenient means of assessing these internal states. However, there are problems with the use of such measures. Research has repeatedly shown that self report measures of anxiety and depression in children lack discriminant validity because of the very high correlations between the two types of measures (Eason, Finch, Brasted, & Saylor, 1985; Ollendick & Yule, 1990; Stark, Humphrey, Laurent, Livingstone, & Christopher, 1993; Strauss et al., 1988; Tannenbaum, Forehand, & McCombs, 1992; Wolfe, Finch, Saylor, Blount, Pallmeyer, & Carek, 1987).

Brady and Kendall (1992) reported that the three most widely used self report measures used in research into anxiety and depression in children are the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985), the STAIC and the Children's Depression Inventory (CDI; Kovacs, 1992). The relationship between anxiety and depression in a non-clinical adolescent sample using the RCMAS and the CDI was assessed by Tannenbaum et al. (1992). Their results showed that the two measures were highly correlated. Tannenbaum et al. (1992) suggested that the measures must therefore be tapping the same construct, so only one of the measures was needed to gain a realistic measure of this construct, namely negative affectivity. Similarly, Strauss et al. (1988) reported that of 106 children attending an outpatient child and adolescent anxiety clinic, those diagnosed with anxiety did not significantly differ from a psychiatric control group on self report measures of trait anxiety (STAIC) or depression (CDI). However, anxious children did report significantly higher state anxiety (STAIC) than controls. Wolfe et al. (1987) assessed anxiety and depression with both self report and teacher report and found further evidence to support the existence of a single construct reflecting internalising disorder.

The question remains whether self report measures are capable of tapping the differences between anxiety and depression. One of the problems with self-report measures is that there is significant item overlap between measures of anxiety and depression for children. As Brady and Kendall (1992) point out, the RCMAS, STAIC and CDI all have items relating to 'making up my mind', and 'having trouble falling asleep'. The CDI and RCMAS have items relating to 'worry about bad things happening to me', 'feeling alone' and 'being tired a lot'.

When omitting overlapping items from the CDI and RCMAS, the shared variance between these two measures is reduced by between 12% and 14%; however it is not clear how this affects the discriminant validity of the two scales (Cole, Truglio, & Peeke, 1997). A study by Inderbitzen and Hope (1995) demonstrated that the CDI was more highly correlated with the RCMAS than with the Social Anxiety Scale for Children -Revised (La Greca, 1991). They suggested that this was due to the shared content between the CDI and the RCMAS which primarily assess negative affectivity. The study also examined the overlap in students with high scores on the measures. All of the students with high scores on the RCMAS reported high scores on the CDI, while only 17% of the students had high scores on both the social anxiety measure and the CDI.

Most studies assessing the relationship between self report measures of anxiety and depression use total scores in their investigation as opposed to factor scores or scales. Research employing total scores along with individual scale scores tends to provide greater evidence of a dual model of anxiety and depression. Mattison, Bagnato, and Brubaker (1988) reported that the Worry/Oversensitivity scale of the RCMAS significantly distinguished a group of anxiety disordered children from a psychiatric control group, and that the Worry/Oversensitivity scale showed the highest mean T-score for the anxiety group. Lonigan, Carey, and Finch (1994) addressed the individual scales of the CDI and the RCMAS using 233 in-patient children with a diagnosis of either depression or anxiety. They reported that when controlling for the general distress elements using the depressed affect scale of the CDI, the anxious group scored more highly on the RCMAS total and RCMAS Worry/Oversensitivity scale than a depressed group. They concluded that Worry/Oversensitivity represents the purest anxiety factor in the RCMAS. Their study suggests that depression and anxiety can be discriminated using self report measures, but the use of total scores on the RCMAS and CDI does not effectively discriminate between the two conditions.

In a more recent investigation, Crowley and Emerson (1996) employed confirmatory factor analysis on the CDI, RCMAS, STAIC trait scale with 273 school children aged between 8 and 12 years. Results were more supportive of a two factor model, than a one factor model, suggesting that self report measures and their scales do help to delineate between anxiety and depression. This study did not elucidate those scores or subscale scores which clearly differentiate between anxiety and depression.

Developmental changes in the manifestations of depression and anxiety are also likely. Craighead (1991) suggested that the existence of depression as a separate condition after puberty was quite clear. Cole et al. (1997) provided support for this in their study using self-report, teacher, parent and peer ratings of anxiety and depression. Cole et al.'s (1997) results of this study supported a tripartite model of anxiety and depression, but this was only evident in the sixth grade children. Data from grade 3 children revealed that depression and anxiety were virtually indistinguishable, which supports a unified model of anxiety and depression in children. They concluded that research into psychopathology in children should be aware of such developmental differences.

This section has considered issues in the differentiation between depression and anxiety mainly through the use of self report measures. To summarise, self report measures of trait anxiety such as the RCMAS and STAIC are not pure measures of trait anxiety, but measure negative affectivity, which is one of the components of trait anxiety, but also one of the components of depression. Most studies of anxiety employ these scales as measures of trait anxiety, so it is important to keep in mind that negative affectivity is also a part of depression. Such instruments may have the ability to discriminate between anxiety and depression when individual scales such as the Worry/Oversensitivity scale of the RCMAS are employed. If discriminant power is necessary, as it may be in cases where diagnosis is important, this may be improved by deleting items which are represented on both anxiety and depression inventories (Cole et al., 1997).

The relationship between anxiety and fear

An understanding of the nature of the terms 'fear' and 'anxiety' is essential to understanding the relationship between these two emotional states. Both fear and anxiety are subjective aversive experiences. Kashani, Dandoy, and Orvaschel (1991) described fear as a reaction to a specific object or situation, and anxiety as non-specific, diffuse and anticipatory in nature. King (1988) added that anxiety is an aversive or unpleasant emotional state which involves subjective apprehension and diffuse physiological arousal. Reed et al. (1992) also pointed out that fear disappears with the withdrawal of the feared object. The most pertinent point is that fear is a response to a specific stimulus, where anxiety is a more diffuse response, which can occur in the absence of a specific stimulus. Fear can be seen as a component of anxiety, but can also exist in isolation, as a natural protective response to a threatening object or situation. Watson and Clark (1984) argued that although measures of negative affectivity and fear are positively correlated (typically at around 0.40) and share some common variance, they are clearly not measures of the same construct.

Fear is commonly assessed via self report using a fear list such as the Fear Survey Schedule for Children - II (FSSC-II; Gullone & King 1992a), which requires children to report their level of fear in response to 78 different items. (Fear is also measured using the earlier versions of this checklist like the FSSC-R; Ollendick, 1983, or the FSSC; Scherer & Nakamura, 1968.) The FSSC-II does not measure the extent of fearful responding in everyday life, but merely the extent of negative affective response to the thought of the occurrence of the event (McCathie & Spence, 1991). Factor analysis of fears reported by children in response to the

FSSC-II reveal that there are five distinct factors within this scale: 'death and danger', 'the unknown', 'failure and criticism', 'animals', and 'psychic stress/medical fears' (Gullone & King, 1992a).

Fearfulness decreases with increasing age (Gullone & King, 1992b) with preadolescent children reporting a greater number of fears than adolescent children (Ollendick & King, 1991). Gullone (1992) summarised normative fear research with children and she concluded that the most common fears across childhood are related to death and danger. She explained that reporting of other fears fluctuates as a function of age, and that fears change in focus from the immediate and concrete (such as the sound of a door banging) in the very young, to the more anticipatory (such as death, ghosts, the dark) in older children. Older children are also more likely to report fears which are social-evaluative in nature, such as talking in front of the class (Gullone & King, 1992b). A follow-up study to Gullone and King's (1992b) study revealed that gender and initial fear scores were better predictors of follow up fear scores than age, suggesting that even though fear is related to developmental level, the trait component to fear is stronger(Gullone & King, 1997). This study also suggested that decreases in fear are greatest between 7 and 10 years of age.

Positive correlations between the number of reported fears and measures of anxiety in children are repeatedly reported (e.g., Friedman, Campbell, & Okifuji, 1991; Gullone & King, 1992b; Muris et al., 1998; Ollendick, 1983; Ollendick & Yule, 1990). These correlations reveal that children reporting a greater number of fears are also more likely to report higher levels of anxiety symptoms. Some fears may be better predictors of anxiety than others. In a study involving 8- to 11-year-old children, Ollendick and Yule (1990) reported that social evaluative fears are higher in children with high self reported anxiety and depression. Friedman et al. (1991) reported that fear of failure and criticism is the best predictor of self reports of anxiety symptoms in a group of children aged between 6 and 11 years of age, followed by fear of the unknown. Muris et al. (1998) reported that some fear items are better predictors of specific anxiety disorders than others, for example, that children reporting high levels of fear in response to the 'spiders' item on the FSSC-II had significantly higher scores on a measure of specific phobia, animal type. Muris et al. (1998) also found however, that FSSC-II items did not always predict anxiety disorders symptomatology as expected, for example, the item 'not being able to breathe' was related to obsessive-compulsive symptomatology. It is not clear to what extent developmentally appropriate fears contribute to general anxiety in children, however studies of anxiety employing developmentally different fears as stimuli for anxiety would be likely to reflect these developmental differences in their anxiety data. Therefore studies addressing developmental differences in fear would be best to use stimuli which show similar fear reports across the age range.

Gender differences are also apparent in children's reports of fear. A consistent finding in research on fear in children has been that girls report more fears than boys (e.g., Ferrari, 1986; Gullone & King, 1992b; Muris et al., 1998; Ollendick & King, 1991). There are also higher correlations between self report of fear and self report of anxiety in girls compared with boys (Ollendick, 1983). It is not clear whether these differences in reporting levels are associated with true differences, or a propensity for girls to report fears more readily. Studies of anxiety which use fear items as anxiety stimuli would benefit by selecting stimuli which elicit similar fear levels in boys and girls.

The relationship between anxiety and self esteem

Recent research points to a negative relationship between anxiety and self esteem. Self esteem refers to one's perception of personal worth (Rawson, 1992). Self report measures of anxiety correlated positively with depression, external locus of control and self-esteem in a study by Rawson (1992). In a study of grade 5 and 6 children, Matthews and Odom (1989) reported that self esteem is significantly negatively correlated with state anxiety, but is not correlated with trait anxiety. This is not surprising in light of the factor analytic studies of the STAIC cited earlier, which show that the trait scale has only negative items while the state scale has two distinct factors, which comprise the positive and negative items of the scale (Cross & Huberty, 1993; Dorr, 1981; Papay & Hedl, 1978). Mathews and Odom's (1989) study also revealed neither state nor trait anxiety is significantly correlated with the 'Social Self-Peers' scale of the Coopersmith Self-Esteem Inventory, yet trait and state anxiety correlated significantly and negatively with the 'School-Academic' scale and trait anxiety alone with the 'Home-Parents' scale.

Greenberg, Solomon, Pyszczynski, Rosenblatt, Burling, Lyon, Simon, and Pinel (1992) reported that when adults are given positive feedback about their personality, they are less likely to report high levels of state anxiety in response to vivid images of death. Similarly, adults' physiological arousal was lower in response to a threatened shock when they were given positive personality feedback. Greenberg et al. (1992) concluded from this study that self esteem serves an anxiety buffering function, which may be particularly relevant to state anxiety.

Evidence suggests that the relationship between self concept and fear differs according to gender. Ollendick (1983) reported that there was a significant negative correlation between self concept and fear scores in his total sample of children, and for girls separately, but not for boys. Fear scores were also found to have a significant relationship with locus of control in this study, with low fear scores associated with high internal locus of control for girls and the total sample. This suggests again the importance of investigating gender issues in any study of anxiety. It may be that self esteem has a positive or buffering effect on anxiety for girls but not for boys.

Kashani, Dandoy, Vaidya, Soltys, and Reid (1990) reported evidence to suggest that children experiencing severe psychiatric conditions are more likely to report lower levels of self esteem, higher anxiety and hopelessness. Silverstone (1991) investigated self esteem levels in adults with a range of psychiatric conditions, and reported that those diagnosed with depression and personality disorders reported the lowest self-esteem, and those diagnosed with anxiety reported the highest levels of self-esteem (although this is still lower than the normal population). This is consistent with Clark and Watson's (1991) tripartite model of anxiety and depression, which suggests that depression is differentiated from anxiety by low positive affect, which is itself related to self esteem.

Conclusions

This chapter has addressed important issues in understanding the nature of anxiety in children. While a structured diagnostic approach to anxiety in children, such as that used in the DSM-IV (1994) may be useful in guiding clinical intervention, the research literature has emphasised the utility of a more functional understanding of anxiety. The concept of negative affectivity is a useful way to understand anxiety and its relation to depression. An understanding of the relationship between fear and anxiety, as well as the importance of self esteem in anxiety are also useful additions to understanding the nature of anxiety. Clearly age and gender issues must be taken into account when investigating anxiety. The following chapter will address the cognitive aspects of anxiety, and develop a more integrated understanding of the cognitive experience of children experiencing anxiety.

Chapter 3: Theoretical Perspectives on Cognition in Anxiety

In the previous chapter, theoretical issues in the study of anxiety were considered, with reference to depression, fear and self esteem. An important aspect of anxiety not considered in the previous chapter was the role of cognition. The current chapter will consider the role of cognition in anxiety, with particular reference to the literature on children. Issues including developmental differences, the role of depression and worry, and gender differences will be considered.

Internal speech, automatic thoughts, self-statements and cognitions are usually considered equivalent terms, all referring to the thoughts which occur within the mind of the individual. Such thoughts are a running dialogue which place an interpretation on the internal and external world of the individual. These thoughts, and their relationship to behaviours and emotions, provide the underpinnings of the cognitive behavioural therapies which have been demonstrated to ameliorate anxiety symptoms in children (e.g., Barrett, Dadds, & Rapee, 1996). Research focuses on the assessment of these internal thoughts, but is generally biased towards assessing cognition in adults and there are relatively few empirical studies of cognition in children (but see, Fox, Houston, & Pittner, 1983; Prins, 1986; Zatz & Chassin, 1983, 1985).

Kendall (1991) used a system model to explain cognition. He explained that the output of the cognitive system is best described as cognitive products, which are the cognitions which result from the interaction of external information with the internal processing of that information. Most research focuses on the output stage of this model, the cognitive products, which are the final output of the higher order components of this information processing system. Children's self-talk is an example of these cognitive products.

The cognition literature often refers to the differentiation between cognitive deficiency and cognitive distortion, and the relation of these two phenomena to psychiatric symptoms (Kendall, 1991). Cognitive deficiency refers to the absence of thinking or careful information processing, perhaps best understood in the example of an impulsive child who does not effectively process information prior to acting. Cognitive distortions, on the other hand, refer to dysfunctional thought processes where the available information is distorted by the individual.

The links between distorted cognitive products and anxiety in children have long been established. For example, according to the DSM-IV (1994) generalised anxiety disorder (formerly overanxious disorder of childhood) has 'excessive worry' as a central diagnostic criterion. Worry in this context is defined as apprehensive expectation, and can be seen as a representation of distorted cognitive products. As stated earlier, treatment of anxiety in children often uses a cognitive behavioural approach (e.g., Barrett et al., 1996; Kendall, 1994). The majority of empirical research focuses on specific fears such as test anxiety (Fox et al., 1983; Houston, Fox, & Forbes, 1984; Zatz & Chassin, 1983, 1985), or medical or dental fears (e.g., Prins, Groot, & Hanewald, 1994).

A model of anxiety-related cognition in children

Studies of cognition and anxiety have generally divided anxiety-related cognitions into four major categories; positive statements, coping statements, internal threat statements and external threat statements. These categories have various relationships to anxiety. Most studies demonstrate that trait anxiety is positively related to coping statements, external threat statements and internal threat statements (e.g., Fox et al., 1983; Houston et al., 1984; Zatz and Chassin, 1983; 1985). The research regarding the relationship between positive statements and trait anxiety is less clear, with some studies demonstrating a negative relationship between these two factors (e.g., Blankstein, Flett, Boase, & Toner, 1990; Zatz & Chassin, 1983; 1985), and others demonstrating no relationship between them (e.g., Prins, 1986; Prins et al., 1994). This section aims to review the literature regarding anxiety and cognition, with particular reference to studies of children and adolescents, and provide a framework of anxiety and cognition for the experiments which follow.

Ingram and Kendall (1987) suggested that anxious self talk is mediated by two cognitive structures known as threat schemata, which form the frame of reference through which the individual views the self, others and the outside world. These two threat schemata, relating to internal and external threat, are consistent with the trait-state conceptualisation of Spielberger (1983). Internal threat schemata can be seen as parallel to trait anxiety, they represent an underlying tendency to focus on internal threat (better described as negative internal states). The anxious individual therefore functions within a background of negative internal dialogue.

External threat schemata, on the other hand, are parallel to state anxiety, and are employed in threatening or dangerous situations, to shift the focus of attention onto the threatening circumstances. Ingram and Kendall (1987) explained that external threat cognition is usually future oriented, and often takes the role of automatic questioning regarding the adequacy of the individual in the situation, for example, 'what if I can't do this?', 'what will I do?'. When the anxious individual is not focussing on the future, Ingram and Kendall (1987) explained that he or she is likely to retrieve threatening incidents from the past and the consequences of these incidents, such as, 'I failed the last test like this, it was awful'. Ingram and Kendall (1987) suggested that anxious individuals are more likely to respond with cognitions related to personal or interpersonal competency. This is consistent with Spielberger's (1983) report that individuals who are high in trait anxiety are more likely to respond with greater increases in state anxiety when the threat involves interpersonal relationships and threat to self esteem. Research into children's fears also demonstrates that social evaluative fears are closely associated with high levels of fear (Friedman, Campbell, & Okifuji, 1991; Ollendick & Yule, 1990). Five studies which address the role of cognition in anxiety are outlined below.

Zatz and Chassin (1983) investigated the cognitions of low, moderate and high test anxious children in a study of fifth and sixth grade children. Cognition was measured with their own self report measure of cognition, the Children's Cognitive Assessment Questionnaire (CCAQ), which consists of 40 test-related self statements representing positive self-evaluations, negative self-evaluations, on-task thoughts and off-task thoughts. Negative self evaluations include items such as 'I have a bad memory', 'I am too dumb to do this' Off task thoughts include items such as 'I wish I were home, I wish this were over'. Positive evaluations include items such as 'I do well on tests like this', 'This test is easy for me to do'. On-task thoughts include items such as 'Stay calm and relaxed', 'pay attention'. Off task thoughts are consistent with Ingram and Kendall's (1987) external threat and negative self evaluations are consistent with internal threat. Zatz and Chassin (1983) reported that high test anxious children endorse more off-task thoughts, on-task thoughts and negative self evaluations as well as less positive self evaluations on the CCAQ. Similar results were found in a second study employing a naturalistic testing situation (Zatz & Chassin, 1985).

Fox et al. (1983) used a think-aloud procedure with fourth grade children prior to a maths test to assess the relationship between anxiety and cognition. They found that trait anxiety was significantly positively correlated with both preoccupation cognitions (which appear to be consistent with internal threat) and justification of positive attitude (which appears to be similar to rationalisation or coping statements). No significant correlation was found between trait anxiety and analytic attitude, avoidant thinking, or positive situation relevant thoughts.

In a related study, Houston et al. (1984) used a cognitions questionnaire in addition to the think-aloud procedure to assess cognition in fourth grade children anticipating a maths game. During an anticipation period, children thought aloud for two minutes and then filled out the cognitions questionnaire. This questionnaire required children to report on a 5-point scale to what extent each item reflected what they had been thinking prior to the maths game. Children's cognition scores were related to their scores on the questionnaire and the think-aloud measure for each category. Trait anxiety was positively correlated with preoccupation (or internal threat) and, for females only with justification of positive attitude (or coping).

These two studies support the link between internal threat statements and trait anxiety, as proposed by Ingram and Kendall (1987). These two studies also highlight the problems with categorisation of cognitions because the categories employed are not consistent with the categorisations used in similar studies, thus making cross study comparisons difficult. Kendall and Chansky (1991) suggested that the lack of coding uniformity needs to be resolved because it interferes with generalisability across studies.

Self talk in children confronted with a fear-producing situation (jumping off diving boards) was reported by Prins (1986). In this study self talk was assessed via a semi-structured behavioural interview, in which children were asked to relate what they thought/said to themselves while they were on the diving board. Prins (1986) assessed self talk using a semi structured behavioural interview following the fear-provoking situation. He reported that the self talk of highly anxious children in this situation was preoccupied with being hurt, vivid memories of past painful experiences and negative task expectations. Those who reported self talk in this study were more likely to be anxious than those who did not. These findings are again consistent with the model proposed by Ingram and

Kendall (1987) by demonstrating the positive relationship between trait anxiety and both internal and external threat statements.

In a study employing a behavioural measure of responding, Vasey, Daleiden, Williams, and Brown (1995) also reported data that support the existence of threat schemata in anxious children. This study employed a probe detection task, where children were presented with two words, either two neutral words or a threatening and a neutral word. Highly anxious children showed an attentional bias toward threat words compared with control participants, demonstrating that their attention is drawn toward threat words. This research circumvents the difficulties associated with more subjective measures of anxiety by measuring reactions to threatening words rather than production of them. Essentially this study took what had until then been a dependent measure, and used it as an independent measure, thus validating the relationship between threat cognition and anxiety. This study further demonstrated that children not only produce more threat related words, but are predisposed to attend to threatening material over neutral material.

Kendall et al. (1991) claimed that anxiety in children is related to an increased rate of negative cognitions, rather than a decrease in positive cognitions, because those who display decreased levels of negative thoughts alone have been found to be less anxious. Kendall (1983) described this as 'the power of non-negative thinking', and suggested that it is the lower frequency of negative thoughts rather than the presence of positive ones which differentiates non-anxious from anxious adults and children.

In a review of the literature, Schwartz (1986) investigated the ratio of positive to negative thoughts reported in groups of individuals experiencing various level of psychological functioning. Functional groups were characterised by a ratio of 1.7 positive thoughts to 1 negative thought, while mildly dysfunctional groups displayed a 1:1 ratio of positive to negative thoughts. Schwartz (1986) reported that treatment studies generally reveal a decrease in negative thoughts, rather than an increase in positive thoughts, which is consistent with the idea that negative thoughts are the most crucial in determining mental health outcomes. These findings are consistent also with Clark and Watson's (1991) tripartite model of anxiety and depression which proposes that anxiety is essentially unrelated to positive affect. Three empirical studies which support Kendall's (1983) 'power of non-negative thinking' are discussed below.

Prins (1986) reported evidence to support 'the power of non-negative thinking' in his study assessing children's cognitive responses to jumping off a diving board. In this study, high anxious children were those who refused to jump, moderate anxious children were those who hesitated and low anxious were those who jumped without hesitation. These groupings were consistent with teacher, interviewer and self report measures of anxiety. In this study moderate and low anxious children were not characterised by any specific self talk style but by a relative absence of negative self-speech. The self talk of the highly anxious children was characterised by negative self speech.

A second study which supports Kendall's (1983) 'power of non-negative thinking' hypothesis is a study of cognition in fifth and sixth grade children in a real test taking situation by Prins et al. (1994). This study demonstrated that high anxious children report more coping thoughts, more off-task thoughts and more negative self evaluations than moderate or low test anxious children, but there was no difference in the number of reported positive self evaluations. Positive self evaluations were related to task performance irrespective of ability. This study also reported that coping thoughts are negatively related to test performance in high anxious children. Although measures of state anxiety were taken in this study, there is no report of the relationship between these measures and cognition. In another study on test anxiety by Fox et al. (1983), no reliable correlations between trait anxiety and positive situation referent thoughts were found.

In a study employing a behavioural approach technique where adult participants were required to touch a harmless snake, Eifert and Lauterbach (1987) reported that the only factor which distinguished those who did touch the snake from those who did not was the balance of reported positive and negative cognitions. This study measured cognitions via think-aloud and questionnaire. Those who did touch the snake produced virtually the same number of positive and negative statements, while those who did not touch the snake produced more negative than positive statements. There was no difference between the two groups on the number of negative self verbalisations reported, which suggests that positive verbalisations enhance the approach behaviour of anxious individuals. This is consistent with the findings of the study by Prins et al. (1994)

which showed a positive relationship between positive statements and test performance. Eifert and Lauterbach (1987) suggested that this issue is probably more complex than just the balance of positive versus negative thoughts, and that it probably depends on the nature of the tasks and the problems investigated.

Kendall's (1983) 'power of non-negative thinking' hypothesis is not without its detractors. Other research suggests that positive self statements can be negatively correlated with anxiety. Blankstein et al. (1990) conducted a study on test anxiety with adults using a thought listing procedure. They reported that test anxiety was positively correlated with negative self referent thoughts (internal threat), and negatively correlated with positive self referent thoughts. Zatz and Chassin (1983, 1985) reported that their test anxious children endorsed less positive self evaluations than the low anxious groups. Similarly, Galassi, Frierson, and Sharer (1981) reported that their low anxious undergraduate students endorsed significantly more positive thoughts on a checklist than either moderate or high anxious participants, and that positive cognitions were more closely related to test anxiety than to test performance. State anxiety was measured by a subjective units of distress scale (suds) in this study, but there was no mention of the relationship between suds and positive or negative thoughts.

Coping cognitions show a surprising relationship to anxiety. Many studies show that those children reporting coping thoughts during a stressful event are more likely to be rated as anxious. For example, Zatz and Chassin (1985) added a coping statements scale to the CCAQ which included items such as; 'Try to calm down', 'There's no need to get upset about this'. The results of this study showed that high anxious children reported more coping statements than low anxious children (as measured by the CCAQ) as well as significantly more off-task thoughts, negative evaluations, and significantly less positive evaluations. Zatz and Chassin (1985) suggested that coping cognitions may act to sensitise children to anxiety, or they may act to distract children from the task, thus increasing their anxiety. This study also revealed that coping cognitions were negatively related to actual task performance on a maths test. They suggested that poor performance may cause both high levels of coping cognitions and high levels of anxiety, without a causal relationship existing between the two because coping statements were unrelated to performance at low or moderate anxiety levels, only at high anxiety levels. Vasey and Daleiden (1996) suggested that coping cognitions may actually represent a response to anxiety rather than representing a cause of anxiety.

A final point to make in this section concerns the relationship between cognition measures and state anxiety. Although a number of the studies described above measure state anxiety, usually through a SUDS measure, or Likert-type measure, these scores are generally used to assess how trait anxiety affects state anxiety. Not surprisingly there are generally positive relationships between these two measures (e.g., Prins et al., 1994; Zatz & Chassin, 1983, 1984). No studies have been found which report the relationship between state anxiety and various cognitive measures. Based on the information available regarding the relationship between threat cognitions and trait anxiety it is likely that there would be a positive relationship between threat cognitions and state anxiety, and the same would probably be true for coping cognitions. While it remains unclear how positive cognitions and trait anxiety are related, investigating the relationship between state anxiety and positive cognitions may help to clarify the issue.

Worry in children

Worry may also be of utility in understanding anxiety-induced cognitions in children. Worry is one of the major cognitive components of anxiety in adults (Barlow, 1988; Mathews, 1990) and is an anticipatory cognitive process which involves repetitious thoughts and images containing fear producing content which are related to possible traumatic events and their potentially catastrophic implications (Borkovec, Shadick, & Hopkins, 1991). The primary aim of worry in adults seems to be the anticipation and avoidance of all possible negative outcomes, and worry is characterised by uncontrolled and ineffective attempts to control the outcomes of a situation which very rarely lead to effective solutions (Borkovec et al., 1991). According to Vasey (1993), there has been little theoretical or empirical research into the role of worry in anxious children and it is likely that children's ability to worry would develop along with cognitive abilities. Vasey (1993) reported that the ability to look into the future for future threats, or to catastrophise, is a central ability required for effective worry.

A study by Vasey, Crnic and Carter (1994) showed that the content of worry is mediated by children's developmental level as measured by both age and self concept development. In younger children, worries were found to be more egocentric and more related to physical threats, while worries relating to behavioural competence, social evaluation and psychological well being were more prevalent with increasing age and self concept complexity. Not surprisingly, these findings are consistent with the fear research, which suggests similar developmental patterns for fears (e.g., Gullone & King, 1992b; 1997).

Differentiating anxiety and depression through cognition

As discussed in the previous chapter, the differentiation between anxiety and depression is problematic when self-report measures are employed. Better discriminant validity is found for cognition self-report measures. Beck, Brown, Steer, Eidelson, and Riskind (1987) described the cognitive content specificity theory in relation to the development of the Cognition Checklist (CCL), a cognition self report measure designed for adults. They explain that the cognitive experience of depressed individuals revolves around the theme of self deprecation and negative attitudes toward the past and future, while the cognitive experience of anxious individuals revolve around the theme of danger, in both a physical and psychosocial sense. The CCL comprises a 14 item depression scale and a 12 item anxiety scale. Results from this study revealed that adults with a DSM-III anxiety disorder diagnosis scored significantly higher on the anxiety subscale while those with a DSM-III diagnosis of a depressive disorder score significantly higher on the depression scale of the checklist. These data lay the basis of what has come to be known as the cognitive content specificity hypothesis, which espouses the view that anxiety is related to threat cognitions and depression is related to loss cognitions. If threat cognitions are taken as parallel to negative affectivity, and loss cognitions are taken as parallel to positive affectivity, then the cognitive content specificity hypothesis has some consistency with Clark and Watson's (1991) tripartite model of anxiety and depression.

More recently, Ambrose and Rholes (1993) found support for the cognitive content specificity hypothesis with children using the CCL. They hypothesised that the impact of threat and loss cognitions would vary as a function of the severity of the anxiety or depression. Their study showed that, while CCL threat cognitions showed a stronger relationship with CDI scores than STAIC scores overall, as the level of threat cognitions increased, their relationship with depression also increased. Conversely, Ambrose and Rholes (1993) reported that low level loss cognitions were related to anxiety, but that this relationship displays a decrement as the loss cognitions reach higher levels. In sum, Ambrose and Rholes (1993) demonstrated that the relationship of threat and loss cognitions with anxiety and depression is not as simple as earlier research has led us to believe, that the relationship between cognition and affect varies as a function of the intensity of the affect and the rate of cognitive output.

Jolly and Dykman (1994), in a study of adolescent in-patients at an acute care psychiatric facility, reported evidence to support the cognitive content specificity theory. Factor analysis of results on the CCL showed that specific anxiety cognitions (for example 'I'm going to be hurt') along with general cognitive content scores, were predictive of the non-cognitive symptoms of anxiety (that is, autonomic symptoms), while specific depressive cognitions such as 'I don't deserve to be loved' and general cognitive content were related to depressive symptoms, but not to anxiety symptoms. It was also noted by the authors that the CCL was originally designed for use with adults, thus the results with this adolescent group may not be reliable. Validity is however demonstrated by high internal consistency, good item-total score correlation, and score patterns in the predicted direction.

Gender differences in anxiety and cognition

Research on anxiety reveals a range of evidence to suggest that anxiety disorders are over represented in girls (e.g., Kashani, Orvaschel, Rosenberg, & Reid, 1989). As explained earlier, one consistent finding in the research on fear is that girls report more fears than boys (e.g., Ferrari, 1986; Gullone & King, 1992b; Ollendick & King, 1991) and that girls show higher correlations between self report of fear and self report of anxiety than boys (Ollendick, 1983). Joiner and Blalock (1995) on the other hand suggest that such gender biases are found in co-morbid and mixed anxiety-depression diagnoses, but not in specific anxiety or depression.

It does not appear that there is any published research which specifically addresses gender differences in anxious cognition, however there are some studies that report gender differences. Zatz and Chassin (1985) found that coping thoughts and positive evaluations are both reported at significantly higher levels in boys than girls in their study assessing cognitions in test taking. Similarly Prins et al. (1994) reported that boys endorse significantly more positive evaluations than girls on the CCAQ. In their study into test anxiety, Houston et al. (1984) found that females reported higher levels of 'justification of positive attitude' thoughts (otherwise described as rationalisation), than males in the pre-test session. Brown, O'Keeffe, Sanders, and Baker (1986) reported that in two of their three stimulus situations more girls than boys reported negative affect cognitions. Girls were also more likely than boys to report coping self-statements in two of the situations in this study. Brown et al.'s (1986) use of 'coping' is different to most other studies reviewed in this section, and includes positive statements as well as coping statements. Ambrose and Rholes (1993) reported no gender differences in response to the CCL for children from fifth to eleventh grade, and found no differences in response according to gender.

It appears that there is extensive evidence to suggest that there are gender differences in the anxiety-induced cognitions of boys and girls. In summary, these studies point to a greater tendency for girls to report higher levels of anxiety-inducing thoughts and lower levels of positive evaluations. Further research is clearly needed in this area in order to elaborate further these differences. It may be that there is an interaction between age and gender, and that the differences become more apparent as children become older. It may also be that gender differences differ as a function of the situation, as Brown et al.'s (1986) study appears to suggest.

Developmental changes in anxiety and cognition

Considering the changes which occur in the focus of children's fears over the age range (e.g., Gullone & King, 1992b; Ollendick & King, 1991) and the different rates of some anxiety disorders at different ages (Kashani et al., 1989), it is likely that there will be some changes in the reports of anxiety-induced cognitions over the age range. Gullone (1992) reported that fears change from immediate and concrete fears in the very young to more anticipatory fears in older children. Older children are more likely to report fears related to social situations, while younger children report more concrete fears. This research is consistent with the hypothesis that the anxiety-induced cognitions of young children are more likely to relate to concrete aspects of threat, while those of older children are more likely to relate to themselves in relation to others, and therefore are more likely to be internally threatening in nature. It is therefore likely that children's anxiety-induced cognitions will move from situation referent to self referent, and from external to internal. Vasey et al. (1994) have presented research which supports this hypothesis. They found that older children showed more worries than younger children which related to the psychological or internal aspects of threat. Younger children were more likely to report concrete and therefore external aspects of threat.

Research into the developmental changes which occur in anxiety-induced cognitions in children has been notably sparse. Four studies which investigated developmental changes are summarised below.

Brown et al. (1985) investigated the developmental changes which occur in children's cognitions to stressful and painful situations with a group of 487 students aged between 8 and 18 years. In this study children were presented with a questionnaire and required to respond to two standard imagined stressors and one personal stressor on the questionnaire, and write down their thoughts.

The data were categorised into coping and catastrophising cognitions. Catastrophising cognitions were classed as those which focussed on or exaggerated negative aspects of the situation including thoughts of escape or avoidance. Coping cognitions were those which were inconsistent with pain or stress, or thought about the stressor in a problem solving manner. (There was no differentiation made between coping statements and positive statements, thus this study has difficulty in adding to the body of research which addresses coping cognitions in the manner discussed earlier.) Children were categorised as either copers or catastrophisers on the basis of the thoughts that they reported, and overall more catastrophisers than copers were found. The study also revealed that the proportion of children who reported predominantly coping thoughts increased significantly with age, and the range of reported strategies also increased with age. Children categorised as predominantly copers displayed significantly lower levels of trait anxiety than those categorised as catastrophisers. The study concluded that there was a developing ability to use coping cognitions in relation to stressful and painful situations from age 8 to 18 years. There are limitations with the use of such a questionnaire method, as it assumes that all children are able to comprehend and respond effectively to the questionnaire. The study also assumed that asking children to recall the cognitions associated with a personal event would bring forth the actual cognitions, where there is no evidence to suggest that this is the case.

Another study looking at developmental differences was conducted by Vasey et al. (1994) and assessed worry in 76 children aged between 5 and 12 years. In this study worry was defined as an anticipatory cognitive process involving repetitive thoughts related to possible outcomes and their consequences. The study investigated the hypothesis that children would increase the number of possible catastrophic outcomes to a situation as age increases and self concept develops. This was investigated by assessing children's responses to their own suggestions of anxiety-provoking situations, as well as to three standard vignettes. The data showed an increase in the number and variety of anticipatory thoughts of threat. The study revealed that older children were more able to elaborate the potential consequences of the situations. This increase occurred at around the age of 8 or 9 years. The study also revealed that worries become less self focussed as age increases. Worries moved from threat to self, to behavioural competence, social evaluation and psychological well-being as age increased, which is consistent with the fear research. Most of these differences were found between the 5- to 6-year-olds and the older children, so it seems that the largest changes occurred at the younger age.

Ambrose and Rholes (1993) assessed the frequency of self reported cognitions in a study of 501 children in fifth, eighth and eleventh grade. In this study, cognition was measured with the CCL and no effect of grade was found in response to either the loss or threat scale of the CCL. This study assessed the frequency of cognitions in the absence of a stressor so the results are probably not equivalent to the other studies discussed in this section which measure cognition in response to specific stressors. The questionnaire format also limited the number of possible responses that were available to participants, which were unlimited in the studies by Brown et al. (1985) and Vasey et al. (1994) which allowed children less structured responses.

Martin, Horder, and Jones (1992) used a Stroop task with spider phobic and non-phobic children to assess the differential effect of the Stroop effect over age. Children were required to report the colour of a word presented to them, and ignore the meaning of the word. The results of this study showed that children classified as spider phobic did show a Stroop effect for spider-related words, as they took longer to report the colour of words which were spider-related than non-phobic children. The magnitude of this effect did not change over the range of ages studied (6 years to 13 years). Martin et al. (1992) concluded that the effects of phobia on cognitive performance appear at a relatively young age, and there was no evidence of there being an early stage of phobia development where the cognitive distortion effect was not evident. It was also noted by the authors that these results are remarkably similar to the findings with adults, suggesting that cognitive distortion does not change with age into adulthood.

The studies outlined here suggest that there is evidence of changes in anxiety-induced cognitions across the age range. In the studies by Brown et al. (1987) and Vasey et al. (1994) it appears that there is an increase in the range of possible outcomes that children report in response to specific situations. The study by Brown et al. (1987) reported these outcomes as coping strategies, and the study by Vasey et al. (1994) reported them as possible threats. The study by Ambrose and Rholes (1994), on the other hand, suggested that there are no such age-related differences. This may be a result of the style of cognition assessment which was employed. Children in this study had only to report the frequency of these thoughts, not the frequency of them in response to a specific stressor, and the manner in which they reported their thoughts was constrained to the self report format, giving them no chance to elaborate further their thoughts. Similarly, the study by Martin et al. (1992) suggested that there was no quantitative difference in the magnitude of the Stroop effect to spider words in children aged between 6 and 13 years. This study also used a very different methodological approach to that of Vasey et al. (1994) and Brown et al. (1987).

Conclusions

It has been demonstrated that anxiety in children is related to increased levels of threat and coping cognitions. The research on the link between positive statements and anxiety remains unclear, as some research presents evidence to suggest that positive statements are unrelated to anxiety, while others suggest that they are negatively related to anxiety. Kendall et al. (1991) would argue that positive statements are unrelated to trait anxiety, which is consistent with Clark and Watson's (1991) tripartite model of anxiety and depression which states that positive affect is implicated in depression but not anxiety. While most research in this area is carried out by inducing state anxiety in the individual, investigation of the role of cognition in state anxiety appears to have been neglected. There is strong evidence of gender differences in anxiety-induced cognitions, which is consistent with the literature on gender differences in anxiety and fear. Evidence also indicates that anxiety-related cognitions (specifically coping strategies and threats cognitions) increase as age increases.

In assessing anxiety-induced cognitions, there are numerous methodological issues which must be considered. The following chapter will outline these issues, particularly in relation to the literature which has been discussed in this section.

Chapter 4: Methodological Issues in the Study of Anxiety and Cognition in Children

The previous two chapters have considered theoretical issues surrounding anxiety and related cognitions in children. This chapter investigates some of the important methodological issues which arise in this area of research. Firstly this chapter will consider the issues surrounding techniques used in the measurement of cognition. Secondly consideration will be given to the methods of managing the verbal output of self report data. Thirdly this chapter will consider the use of imagery in anxiety induction, and its utility with a child population. Finally, although issues in the use of self report measures of anxiety in children have been addressed in previous chapters, the psychometric properties of the scales to be used in the experimental chapters of the thesis will also be considered.

Measurement of cognition

Measurement of self reports is fraught with difficulty, because regardless of the methodology employed, it is not possible to measure directly cognitive activity. Researchers must therefore use methods which address their research aims in the most reliable and appropriate manner. With children, the selection of methods will also vary according to their developmental appropriateness. Genest and Turk (1981) pointed out that self report data have many limitations. They can be incomplete; reactive to environmental influences; inconsistent with observational data; idiosyncratic; and confounded by investigator bias during interpretation.

Clark (1988) stated that the validity of self talk measures must be established. Techniques should display content validity, concurrent and discriminant validity, and should be sensitive to changes in cognitive output as a result of treatment. However there has been little research which addresses the reliability and validity of cognitive measures (Francis, 1988), or which attempts to measure cognitive changes after therapeutic intervention (Last, Barlow, & O'Brien, 1985). In a review of the literature, Clark (1988) concluded that no individual method of cognitive assessment is consistently superior to all others and each has advantages and disadvantages which need to be considered in their selection (Kendall & Chansky, 1991). This section will consider the relative advantages and disadvantages of some of these different methods of assessing cognition in children.

Self report assessment of cognition can be broadly divided into production and endorsement methods, where the former require the individual to report actual cognitions, and the latter require the individual to endorse cognition items on a checklist. This section will describe some empirical studies using production and endorsement techniques and consider the methodological issues highlighted by each study. Specific research findings will not be described in full because the content of these studies either bears little relevance to the current study, or has been outlined elsewhere.

Production techniques: think-aloud and thought listing

Think-aloud

One of the most widely used methods of assessing self talk in individuals is the think-aloud method, where the participant is asked to say out loud the thoughts that he or she experiences in response to a stimulus. The think-aloud technique uses either in vivo (e.g., Eifert & Lauterbach, 1987), or imagery (e.g., Davison, Robins, & Johnson, 1983) methods of stimuli. The obvious advantages of this technique are, firstly that participants report their own thoughts and are not constrained by the items on a checklist, and secondly that they are reporting them as they happen (or as close to as possible), rather than recalling them at a later time. Ericsson and Simon (1980) suggest that because verbal information is stored in short term memory, only the most recent information is directly accessible, therefore the think-aloud method more accurately measures the essential characteristics of the cognitive products. The think-aloud method is not reliant on retrospective memory and distortions, and therefore minimises participants' causal inferences (Genest & Turk, 1981).

Ericsson and Simon (1980) have pointed out that think-aloud procedures have been criticised for a number of reasons. Firstly, verbalisations may be reactive and participants may report only selected cognitive products. Secondly, participants may not report all of the available information in short term memory. Thirdly, because different thoughts can occur simultaneously, participants may report thoughts that are irrelevant to the processes of interest. Kendall and Hollon (1981) therefore suggested that to use this method is to interrupt the flow of normal internal speech. Genest and Turk (1981) also outlined a number of difficulties with the think-aloud method. They suggested that having participants verbalise their internal experiences can slow them down, distort the cognitions reported, and necessitate the omission of content because of time constraints, or problems expressing themselves. Secondly, Genest and Turk (1981) suggest that the process of having participants think-aloud may inhibit them through self consciousness, so the least obtrusive, and reactive method of assessing cognition is via recording without participants awareness. Current ethical considerations make this option impossible.

One of the early references to the think-aloud method is made by Diener and Dweck (1978). This study looked at the achievement-related cognitions reported by children classified as mastery oriented or helpless following failure. In this study the children were told that the experimenters were interested in the things children their age think about while doing such tasks. They were simply asked to verbalise what they were thinking about as they performed a specified task. All verbalisations were recorded verbatim and classified into appropriate categories and analysed. The authors noted that while some children were hesitant on the first trial, all children did make some sort of verbalisation, and by the second trial they seemed at ease with the task. Significant differences were found between the verbalisations of the two groups of children. This demonstrated the utility of the think-aloud approach in establishing group differences in children.

Fox et al. (1983) used the think-aloud method to investigate trait anxiety and test taking in fourth grade children. In this study children were required to spend two minutes immediately before taking a test saying aloud their thoughts and feelings into a tape recorder while the experimenter was out of the room. These thoughts and feelings were then rated on a number of different categories, such as preoccupation and justification of positive attitude and analysed in relation to the children's levels of trait anxiety. Trait anxiety correlated positively with preoccupation and justification of positive attitude. The paper concludes that the think-aloud procedure is successful and that this is in part due to the age of the children. The authors argue that at this age, self talk has only been internalised for a limited amount of time, so is easily accessible in a think-aloud task. Having the experimenter out of the room partially addresses the problem of self consciousness raised by Genest and Turk (1981).

In a follow up study to Fox et al. (1983), Houston et al. (1984) again used the think-aloud method in their investigation of anticipatory anxiety cognitions but this time in conjunction with a cognition questionnaire. The cognition questionnaire was devised to include self statements which would fit all of the seven categories of cognition under investigation, and participants rated the extent to which each cognition occurred to them during anticipation of a maths test. The children were first required to think aloud their thoughts and feelings and then completed the self report measure. Scores for the think-aloud and the self report measures were significantly positively correlated for five of the seven categories, although correlations were small in magnitude. This study is one of very few which measure cognition by two methods, and it is encouraging that the responses to the two different measures are correlated.

Davison et al. (1983) used audio recordings of simulated situations to stimulate participants' self talk in an investigation designed to provide a paradigm for assessment of cognitions. While listening to recordings of two stressful situations, participants were asked to imagine as clearly as possible that they were a part of the event and to focus on their thoughts and feelings. During silences in the recordings, participants were asked to say out loud their thoughts, which were recorded. These data were then transcribed and categorised into 25 different categories loosely based along cognitive behavioural lines, but also based on typical responses to the tapes. Measures of interrater reliability were taken, with around 75% agreement among raters. This method gives a direct and flexible approach to assessing cognitions in a variety of situations and allows the use of stimuli which would be impractical or unethical to use in vivo. A more recent paper by Davison, Navarre, and Vogel (1995) describes this method more fully, and recommends the use of a practice session before data are collected to ensure that participants can fully visualise the stimuli. They suggest that because this method accesses cognitions as they occur, it may be better suited to tapping actual thoughts than other methods.

In a comparison of the efficacy of the think-aloud method, videotape reconstruction and a 24 item self-verbalisation questionnaire, Eifert and Lauterbach (1987) reported that the think-aloud method is the preferable method. For this study participants were required to approach a glass cage containing a python while thinking aloud. They then touched and held the python, and if possible allowed the snake to crawl on their laps. For the video reconstruction method, participants viewed a video of themselves approaching the snake and recalled and verbalised what they thought, felt and said to themselves. The verbalisations for both methods were taped and subsequently categorised into positive and negative statements by independent raters. While participants produced higher levels of verbalisation in the videotaped reconstruction than in the think-aloud method, the video output included far more clinically irrelevant and incidental comments, plus the interrater reliability is lower for this than the think-aloud method. Eifert and Lauterbach (1987) noted that the videotape method is more time consuming and intricate to score. Finally, it was found that during the use of retrospective methods of assessment (that is video reconstruction and self-verbalisation questionnaire), it appears that participants tried to adjust their verbalisations to fit with their overt behaviours so it was suggested that the think-aloud method was more able to reflect truly internal speech.

In summary, the think-aloud method is effectively used in adult and child populations to stimulate self talk (Davison et al., 1983; Diener & Dweck, 1978; Eifert & Lauterbach, 1987; Fox et al., 1983; Houston et al., 1984). The findings of these studies suggest that the method is sensitive to group differences (Diener & Dweck, 1978), and the output correlates with other measures such as trait anxiety (Fox et al., 1983; Houston et al., 1984). The output also correlates with self statement questionnaires (Houston et al., 1984). One comparative study with adults suggests that the method is more able to reflect the true flow of internal speech than retrospective methods (Eifert & Lauterbach, 1987). While there has been extensive use of the method with children in test taking situations and in other performance based situations, the imagery method espoused by Davison et al. (1983) and Davison et al. (1995) has not been used with children. There is probably some scope therefore for the use of this method with children.

Thought listing

Thought listing techniques require that participants retrospectively report, usually in written form, their thoughts from a specific time interval (Clark, 1988). Using a written response format with children has clear disadvantages when considering the literacy levels of young children. Brown et al. (1988) explain that their 8- to 9-year-old children produced the largest number of unscorable responses in comparison to the older age groups. Thought listing has the disadvantage that it does not require children to report their cognitions immediately; often children are asked to recall their thoughts after the event.

Prins (1986) used a behavioural interview to assess 8- to 12-year-old children's spontaneous use of self speech and self regulation in a fear producing behavioural test involving jumping or diving off diving boards at a swimming pool. The interview was semi structured, designed in such a way that the children could deny the occurrence of self speech. Pertinent questions were asked of the participants regarding what they were thinking/ saying to themselves while they were waiting to jump off the board.

This study showed that between one third and two thirds of the total sample reported no self speech in the various different tasks. This is vastly different to the cited research on the think-aloud method, where no reference is made to participants failing to verbalise (Davison et al., 1983; Diener & Dweck, 1983; Eifert & Lauterbach, 1987; Fox et al., 1983; Houston et al., 1984). As an explanation for this lack of self talk in some participants, Prins (1986) has suggested that the less difficult tasks become more automated, and therefore are less likely to require verbal mediating responses. Prins (1986) noted that incidental observations suggested that children may have become bored with answering the self speech questions (they had to do this five times), and some answered 'I've told you already!' at the fifth questioning. This technique assumed that individuals could accurately recall and report their cognitions after the event.

In another thought listing study focussing upon children's coping self statements in response to imagined stressors, Brown et al. (1986) investigated the relationships between cognition and trait anxiety, age and gender. Children between 8 and 18 years of age were asked to respond in writing to a questionnaire that asked them to imagine themselves firstly at the dentist about to receive an injection, secondly giving a report in their class, and thirdly in a situation of their choosing that had worried or troubled them recently, and then to write down their thoughts in response to the situations. The study concluded that cognitions for children as young as 8 years of age can be reliably determined using a self report questionnaire. Twelve and a half percent of responses were unscorable for the personal stressor question in the 8 to 9 year age group, thus biasing the sample towards more literate children. It is suggested that the questions would have generated better responses if asked orally.

Vasey et al. (1994) used a thought listing interview procedure to assess worry in children across three age groups ranging from 5 to 12 years of age. The interview initially elicited from children the situations in which they experienced worry and the cognitions associated with these situations. Participants were then presented with three vignettes of fictitious children in worrying situations and asked to list all the things that the child in the story could be worried about, then to list all of the related worrying possibilities. Thus children's own experiences of worry were studied, in addition to their assumptions concerning the worry of others. Worrisome thoughts were found to be more prevalent and varied in children of 8 years and older. Vasey et al. (1994) suggest that younger children may have less awareness of the possible outcomes of situations, thus less possible outcomes to worry about.

In summary, the thought listing method of cognition assessment has been used with children and adults, however it seems that there are some concerning limitations of the method when children are required to give written responses. The study by Brown et al. (1986) showed that in children aged 8 to 9 years, there were the largest number of unscorable responses compared with older children. This finding suggests that the thought listing method employing written responses is probably not an appropriate method for the study of anxiety-induced cognitions in children.

Endorsement techniques

Self statement questionnaires

Clark (1988) reported that structured questionnaires are the most widely adopted method of assessing cognitions. The reason for this appears to be their reliability and validity as alternate measures of anxiety or depression. Glass and Arnkoff (1982) suggest that questionnaires reflect the importance or relevance rather than the frequency of a cognition, that participants may experience similar but not identical thoughts and that participants may interpret the questions as affective rather than cognitive. Kendall and Chansky (1991) added that while endorsement techniques may be more valid, it is possible that they provide more of a global measure of distress than a measure of current internal dialogue. Clark (1988) suggested that because questionnaires rely on recognition rather than recall, responses 'may be more susceptible to selective memory biases, social desirability response sets, post performance rationalisations, inconsistent responses and demand characteristics than measures that rely on the recall of thought content' (Clark, 1988, p. 3). However he concluded that although there has been an over reliance on the self statements questionnaires, these measures clearly display the strongest validity, in that they are able to differentiate between adjusted and maladjusted groups, they are sensitive to treatment effects, and show consistent correlations with corresponding affective states measured by self report and observation.

There is a number of self report inventories developed to assess cognitions in anxious children. Generally these are based upon adult research (Beck et al., 1987; Zatz & Chassin, 1983), and then applied to children (e.g., Ambrose & Rholes, 1993). Self report methods are reliant on the ability of children to recall their thoughts, and it is unclear to what extent children can recall such thoughts. Further, Eifert and Lauterbach (1987) reported that adults using a self report questionnaire endorsed significantly more statements than they produced in either the think-aloud or a video reconstruction method, suggesting that questionnaires are prone to over endorsement, thus giving an unrealistic measure of cognitions.

Kendall and Hollon's (1989) Anxious Self Statements Questionnaire (ASSQ) was devised for adults using an interview technique. Items for the inventory were initially generated from 508 undergraduate students who recalled an anxiety provoking experience, recreated it mentally and recorded verbatim their first thoughts. These data were then developed into a self statement questionnaire, using a sample of high anxious and low anxious students designated by the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1942) anxiety scale and STAI scores. The ASSQ is capable of distinguishing between high and low anxious groups. Kendall et al. (1991) reported on the development of the children's version of the ASSQ, the CASSQ, designed to assess anxiety-induced cognitions in children. In this study children reported the frequency of a range of thoughts experienced over the last week. Preliminary reliability and validity data were reported to be promising and the scale was able to differentiate between anxious and non anxious children, as categorised by RCMAS and STAIC. Kendall and Chansky (1991) conceded that the scale may be measuring global distress (as suggested by Strauss, Last, Hersen, & Kazdin, 1988), rather than psychopathology specifically related to anxiety. As previously discussed, the RCMAS and STAIC tend to be measures of negative affectivity, rather than pure anxiety, so the findings of Kendall and Chansky (1991) are no guarantee that the scale is capable of differentiating between anxiety and other disorders such as depression.

As previously discussed in Chapter 3, the Cognitions Checklist (CCL, Beck et al., 1987) is a self report measure originally designed to measure the frequency of automatic thoughts relevant to anxiety and depression in an adult population. The CCL has good discriminant validity when used to assess anxiety and depression (Beck et al., 1987). Ambrose and Rholes (1993) have since used the CCL with fifth, eighth and eleventh grade children and concluded that the CCL can be used with younger age groups without substantial modification. Jolly and Dykman (1994) studied adolescent in-patients at an acute care psychiatric facility using the CCL. The authors accept the reliability problems of using an adult measure with adolescents although they noted that reliability was demonstrated by high internal consistency, good item-total score correlation, and score patterns in the predicted direction.

The Children's Cognitive Assessment Questionnaire (CCAQ, Zatz & Chassin, 1983) is a self report measure derived from the adult literature and designed to assess children's cognitions. It consists of 40 yes/no items, each prefaced by "I thought...". Four subscales are included in the questionnaire: positive evaluations, negative evaluations, on-task thoughts and off-task thoughts. Results showed that fifth and sixth grade children classed as high test anxious, reported more task debilitating cognitions on both the negative evaluations subscale and the off-task subscale, displaying a similar profile to adults. Zatz and Chassin (1985) updated the CCAQ to include a coping scale, which is also positively related to test anxiety.

In summary, structured questionnaires are reported to be a valid means of assessing cognitions in children; however it is possible that participants interpret the questions as affective rather than cognitive, therefore the responses to these questionnaires are more likely to reflect global distress rather than direct measures of internal dialogue, and thus cast doubt on their validity. As questionnaires are also retrospective in nature, it is likely that they will be impacted upon by selective memory and demand characteristics. However, the bottom line is that these measures are sensitive to treatment effects, and can differentiate between adjusted and maladjusted groups, as well as providing some differentiation between anxiety and depression.

Summary comments on measurement of cognitions

Clark (1988) concludes from a review of the literature that methods such as thought listing and think-aloud are not more accurate than self statement questionnaires, and their validity has not been established. However, he points out that this may in part be due to an over reliance on the endorsement techniques, and that there is not enough research addressing validity issues for other measures. He claims that emotional intensity and degree of belief and control associated with cognitions may be important issues to address in future research. The accessibility of cognitive phenomena does affect the accuracy of assessment of cognitions.

Finally, Clark (1988) states that there is little agreement between different methods of assessment. It is likely that this reflects the differing cognitive processes involved in accessing cognition via different methods. Genest and Turk (1981) suggest that in the early stages of research it is appropriate to use less structured approaches to cognitive assessment such as think-aloud and thought listing, as this will facilitate unanticipated, yet relevant data coming to light. As specific hypotheses are developed, more structured measures should be employed to address these.

Categorisation of cognitions

Before verbal material is transformed into quantitative data, material must be transcribed verbatim. According to Genest and Turk (1981), all transcriptions involve some margin of error partly due to unclear recordings, and partly due to human error. Data must then be broken down into meaningful units of speech. Genest and Turk (1981) suggest three methods. Firstly for judges to give global ratings of the verbalisations (e.g., Houston et al., 1984), second to unitise these data according to time segments and have judges rate individual time segments, and thirdly to unitise the data into some naturally occurring unit of speech (e.g., Davison et al., 1983). Any method using global ratings will lose vast amounts of information, so is generally considered inappropriate for research. The second method described is also likely to lose a certain amount of information, as thought may change within time segments. The latter of these three methods is therefore seen as the most satisfactory, and it seems, the most commonly used method (e.g., Blackwell et al., 1985; Davison et al., 1983; Eifert & Lauterbach, 1987).

Genest and Turk (1981) reported on a method which uses paralinguistic cues such as pauses, shifts in tone, speed and inflection to unitise verbal data. They recommend that raters view the transcripts while listening to the recordings of verbalisations. In the study by Davison et al. (1983) data are unitised by trained scorers into 'idea units' (p.26), which are units of speech that are as small as possible without distorting the assumed meaning of the speaker. In this study, the second rater used 96% of the same boundaries as the first; however the second employed additional boundaries which reduced the agreement to 83%. Eifert and Lauterbach (1987) used a similar method, where discrete verbalisations are counted according to cues like sentence structure, changes in content and pauses. Blackwell et al. (1985) also used a similar method which includes sentence structure and content as a basis for running verse into units of speech. In this particular study raters received eight hours of training prior to rating data, and there was a 96.5% agreement rate.

There is a lack of established categorisation systems for the investigation of cognitive products. Kendall and Chansky (1991) have suggested that the lack of coding uniformity across studies interferes with the generalisability of research findings. For example, the studies by Houston et al. (1984) and Fox et al. (1983) reported categories which were difficult to compare with related studies. Also, because a majority of the empirical work in this area focuses on test anxiety, many categorisation systems are based on a test taking model, therefore include categories such as 'on-task thoughts' and 'off-task thoughts'. Systems based on the test taking model are not always relevant to other studies. Also, categorisation systems must take into account the differences between coping statements and positive statements. This is highlighted in the study by Brown et al. (1986), where thoughts were split into coping and catastrophising. In this study, coping included both coping statements and positive self evaluations.

Kendall and Chansky (1991) suggested that there must be differentiation between thoughts that are essentially strategic in nature and aimed at inspiring action and those that are seen as 'good' thoughts that help the individual to cope. The latter of these types of coping statements are probably more correctly rated as positive statements, as they do not represent an attempt by the individual to cope with the situation, but rather are task facilitative in and of themselves. Clearly any categorisation system will depend upon the interest of the investigators (Genest & Turk, 1981) or the aims of the study.

Numerous categorisation systems have been used in the study of cognition in children. Craighead, Kimball, and Rehak (1979) and Blankstein, Flett, Boase, and Toner (1990) have suggested that cognitions can be classified into four categories: positive self-referent, negative self-referent, positive task-referent and negative task-referent. Such a categorisation system does not take into account coping statements, thus loses important data required for any effective investigation of anxiety-induced cognitions. The categorisation systems of Houston et al. (1984)

and Fox et al. (1983) have previously been discussed. Their use of categories such as 'justification of positive attitude' and 'performance reassurance' may have suited the aims of the experiment, but are not easily comparable to other studies. Brown et al. (1986) rated thoughts according to 13 different categories, which were then divided into coping and catastrophising. All of these categorisation systems have their advantages and disadvantages, but it is suggested that studies of anxiety-related cognitions in children should at least take into account positive and negative self and situation referent cognitions as well as coping cognitions.

In summary, it appears that unitisation presents an effective means of managing verbal output. These data can then be categorised according to a system which is appropriate to the particular study.

Imagery induction of anxiety

As previously discussed in this chapter, Davison et al. (1983, 1995) recommend the think-aloud method in conjunction with an imaginal script as a paradigm for cognition assessment. Due to the ethical difficulties involved in exposing a child to some in vivo anxiety provoking situations, the use of such imaginal scripts is clearly preferable. Research such as that conducted by Davison et al. (1983) is based upon the assumption that the emotional responses induced by imagery procedures are equivalent to those experienced in the real situation.

Lang's (1979) bio-informational theory of emotional imagery investigated the assumption that responses to imagery are equivalent to real life responses from the perspective of both psychophysiology and information processing. He described an emotional image as one which integrates stimulus propositions (descriptors of the stimulus such as visual and aural information) and response propositions (descriptors of the individual's behaviour within the image which can include verbal, motor and visceral responses). Such imagery is found to induce physiological responses which mimic the responses experienced in an in vivo situation. Lang, Kozak, Miller, Levin, and McLean (1980) have found that imagery involving both stimulus and response material induced greater levels of physiological responding than imagery which consists only of stimulus material.

Using Lang et al.'s (1980) imagery induction technique on undergraduate students, Fernandez and Allen (1989) compared responses to imagery of test taking with responses to real examinations. They found that participants experienced significantly greater levels of emotional arousal during the actual examination than during the imagery, but that the pattern of emotional responses for the two situations was almost identical. Measures of cognition were taken after completion of the exam, but unfortunately not after completion of the imagery, so there were no comparisons between reported cognitions in response to the imagery and in vivo situations. Lang, Levin, Miller, and Kozak (1983) found similar results, namely that imagery induced physiological responses mirror responses shown during in vivo exposure.

Imagery has also been effectively used with panic disordered adults in conjunction with physiological response cues to induce anxiety in a study by Watkins, Clum, Borden, Broyles, and Hayes (1990). The imagery included prompts to recall pertinent cognitive responses to the stimulus situations, as well as cues about the physical setting and physiological responses. Not all imagery studies employ individual imagery scripts. For example Lang et al. (1983) used standard scripts such as encountering a snake, giving a speech, and experiencing a fire in a theatre with socially anxious and snake fearful participants.

There is limited research which verifies the validity of the use of imagery to induce anxiety responses in children. Most studies of this nature tap the physiological dimension of anxiety in response to imagery. King, Ollendick, and Gullone (1990) report that although the extent to which different emotions are associated with different autonomic patterns in children is not well understood, it is clear that fear imagery does induce psychophysiological arousal in children.

A study by Hermecz and Melamed (1984) assessed children's physiological responses to imagery and a dental video prior to in vivo dental treatment. Neutral imagery was used to train participants in imagining. Vividness of imagery was measured by their scale, The Image Clarity Scale, which consisted of seven pictures of a neutral object displayed from very blurry to very sharp in focus, and children responded by pointing to the clarity of the scene just imagined. For the stimulus training, children were asked to create a detailed image of what the situation would be like, and were then asked a series of questions relating to the physical aspects of the scene. Each stimulus oriented response was praised. For the response training children were given similar scripts, but this time the experimenter emphasised active responding, and children were asked to involve themselves in the image as active participants.

Questions this time relate to the children's responses to the scene, and each response oriented answer was praised. The video which followed showed a child undergoing treatment and included a narration which again either emphasised response or stimulus material.

Results of the study by Hermecz and Melamed (1984) showed that children given response training responded with greater breathing and heart rate reactivity than those given stimulus training. Other findings of interest revealed that response participants showed an increase in reported clarity from trial one to trial two, while stimulus participants showed a decrease in imagery over the trials. Imagery was also negatively correlated with age, with younger children reporting clearer imaging of the scripts. Physiological responses increased with increases in reported imagery. Hermecz and Melamed (1984) concluded that response imagery induced more complete processing of the images, and this was reflected in the greater clarity of reports and greater magnitude of physiological responses to response imagery.

Imagery was effectively employed with children in an anxiety treatment study by King, Cranstoun and Josephs (1989), who used emotive imagery in a treatment study of children's night time fears. Emotive imagery involved the use of positive imagery to induce emotional responses which were inconsistent with anxiety. This technique was previously used by Jackson and King (1981) in a treatment study of trauma induced phobia. This research provides evidence that imagery can induce psychophysiological responses in children which mimic those found in the real situation. It would therefore seem likely that it can also stimulate similar cognitive responses to the real situation, suggesting that Davison et al.'s (1983) paradigm of imagery induced anxiety is an effective means of assessing cognitive response.

In summary, it appears that imagery can be effectively employed to induce anxiety in children. Imagery scenarios should employ both stimulus and response cues to most effectively induce anxiety. Scenarios can be developed for individuals or to be administered to a group of participants. Perhaps the greatest advantage of such methods, is that they provide an ethically acceptable alternative to in vivo exposure to anxiety-inducing stimuli.

Self report measures of anxiety

The investigations to be described in the following chapters will employ some commonly used self report measures of anxiety in children. These measures have already been discussed in some detail from a theoretical perspective, however, it is important to also consider their psychometric properties. This section of Chapter 4 will address the important issues in the use of the RCMAS, the STAIC and to a lesser extent, the STAI.

Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978)

The original Children's Manifest Anxiety Scale (CMAS) was designed in 1956 by Castenada, McCandless and Palermo and based upon an adult scale with items drawn from the Minnesota Multiphasic Personality Inventory (Hathaway &

McKinley, 1942). The CMAS has been modified by Reynolds and Richmond in 1978 with the aim of lessening the administration time, increasing the clarity of items, lowering the reading age of the test to make it more suitable for young children and improving the psychometrics of the test. The scale includes 20 new items, and 27 old items, and the wording has been modified to be equivalent to about grade 3 reading level. It is recommended that the scale be read aloud to younger children. Results of the initial study (Reynolds & Richmond, 1978) revealed that females reported higher levels of anxiety than males and that there were no significant grade differences, although there was a tendency for anxiety to decrease with age. Wisniewski, Mulick, Genshaft, and Coury (1987) reported similar gender differences, with females reporting higher levels of anxiety than boys. The lie scale of the test has been found to show relatively high scores for first grade children, and it is recommended that care should be taken in using the scale with children of this age.

In 1985 the RCMAS was commercially published with a manual by Reynolds and Richmond. The scale includes a total anxiety score and three factor analytically derived scales as well as a lie scale. These scales include somatic problems (Physiological Anxiety), worry and rumination (Worry/Oversensitivity) and concentration and attention difficulties (Social Concerns/Concentration). Responses are based upon a yes/no format, and norms are provided for children between 6 and 19 years of age. The standardisation sample included 4 972 school age children from the United States of America. Subscales were established in a study by Reynolds and Paget (1981). Reliability is based upon internal consistency ranging from .56 to .80 across the 11 age groups for its three factors, and internal consistency coefficients for the total anxiety score is consistently above .80 (Reynolds & Richmond, 1985). Test-retest reliability is reported at one and five week retest intervals in a study by Wisniewski et al. (1987) using children in sixth, seventh and eighth grade classrooms. One week retest correlations were 0.88, and five week retest correlations were 0.77, suggesting excellent reliability. In all cases re-test means were lower than initial means.

Construct validity is based upon the trait scale of the STAIC, and a correlation of 0.85 ($p<0.001$) is reported (Reynolds, 1980) with a sample of clinic referred children. Reynolds (1980) also reported small but consistently positive correlations between children's ratings of their anxiety and teachers' observations of behaviour. A study by Lee, Piersel, and Unruh (1989) suggested that the Physiological scale of the RCMAS does not display convergent nor discriminant validity based on behavioural reports by teachers and parents.

The different scales of the RCMAS have received limited attention in the research literature. A study by Lonigan, Carey, and Finch (1994) addressed the individual scales of the CDI and the RCMAS, assessing 233 in-patient children at a psychiatric unit of a medical school with the CDI and RCMAS. Results revealed that when controlling for the general distress elements using the depressed affect scale of the CDI, the anxious group scored higher on the RCMAS total and RCMAS Worry/Oversensitivity scale. They concluded that Worry/Oversensitivity represents the purest anxiety factor in the RCMAS. They further explained that the Physiological scale does not seem to be specific to anxiety, and the Social Concerns/Concentration scale is similar to the CDI, and reflects depressed mood and negative self evaluation. The findings of Norvell, Brophy, and Finch (1985) foreshadow these findings. Using regression analyses, Norvell et al. (1985) found that the Physiological Anxiety and Social Concerns/Concentration scales of the RCMAS together predicted CDI Dysphoric Mood scale, while the Worry/Oversensitivity scale added no significant variance.

The Lie Scale reflects a child's tendency to fake good, or to have an inflated or inaccurate sense of self. Hagborg (1991) reported that the Lie Scale showed concurrent validity as a measure of social desirability in a sample of non-clinical high school students. The Lie Scale did not correlate with the anxiety scales, or total score, suggesting that high scores on the Lie Scale do not contaminate the reporting of anxiety on the RCMAS in a non clinical sample. Reynolds (1981) reported that the Lie Scale appears to be a measure of defensiveness or social desirability, and suggested that the correlation of -0.5 between the Lie Scale and the STAIC state anxiety measure supports this, as children who were high on social desirability would be less likely to report high levels of state anxiety.

In conclusion it appears that the RCMAS is a measure which has adequate reliability and validity as a self report measure of anxiety. Most studies of validity appear to have been completed with other self report measures of anxiety. The RCMAS is at worst a measure of negative affectivity, and at best the Worry/Oversensitivity scale is a promising measure which may tap distress more truly related to pure anxiety. Additionally, high scores on the Lie Scale should not be taken as evidence that children will under-report anxiety symptoms on the rest of the scale.

State Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973)

This scale has been discussed at some length in Chapter 2, particularly in relation to its utility as a specific measure of anxiety as opposed to a measure of general negative affectivity, and the factor analytic studies of the state scale. This section will be confined to discussion of other psychometric qualities of the instruments.

The STAIC is a downward extension of the State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970) and was initially developed as a research tool for measuring anxiety in primary school aged children. It comprises two separate scales, one for measuring trait anxiety and one for measuring state anxiety. The different qualities of trait and state anxiety have been previously addressed in Chapter 2. Research evidence suggests that the trait and state scales are measuring different aspects of anxiety, and this was illustrated by Reynolds (1981) who demonstrated that the RCMAS was significantly correlated with the trait scale but not the state scale. The STAIC was initially developed to assess anxiety in 9- to 12-year-old children, but can be used with younger children with average or above reading ability, and older children of below average reading ability. The scale has since been appropriately used with grade 7 and grade 8 children (Cross & Huberty, 1993). Test-retest reliability over a six week interval for the trait scale was only moderate, which Spielberger (1973) comments may be due to the instability of personality structure of children at this age. Reliability coefficients for the state scale are lower than the trait scale, as would be expected.

Internal consistency of the measure is reasonably good, but does not show the same stability as the STAI (Spielberger et al., 1970). The scale also shows adequate validity, by its correlations with the CMAS (Castenada et al., 1956).

The trait scale of the STAIC consists of 20 statements asking children to report how they generally feel on a three point scale. The manual notes that girls report consistently higher trait anxiety scores than males, and that children from lower socioeconomic backgrounds score higher on the trait scale, but that race and grade do not impact upon reports of trait anxiety.

The state scale consists of 20 statements measuring how children feel at a given moment in time, on a three point response scale. The state scale has also been shown to be sensitive to changes in instructions. Spielberger (1973) explained that children reported significantly higher state anxiety when asked how they would feel prior to their final examinations compared with how they felt in a normal situation and that each item on the scale was able to discriminate significantly between the normal and test conditions. Spielberger (1973) demonstrated that children with high trait anxiety experience elevations of state anxiety of greater intensity in response to dangerous or threatening stimuli than do those with lower levels of trait anxiety. Spielberger (1973) reports in the manual for the STAIC that situations in which failure is experienced or situations in which personal adequacy is evaluated are more likely to induce state anxiety scores of greater intensity in high trait anxious children.

State Trait Anxiety Inventory (STAI; Spielberger, 1983)

The STAI is the original inventory designed by Spielberger and colleagues in 1970, and is designed for use with an adult population. In 1983 an updated form, Form Y, was produced and published (STAI; Spielberger, 1983). The scale consists of 20 item trait and state forms, of which each has a four point response format. The manual notes that when state anxiety is measured in a neutral environment, it will be approximately equal to trait anxiety. As with the STAIC, the state scale of the STAI is sensitive to changes in immediate stress, such as examination induced stress, and elevated state anxiety is found in both males and females. The test-retest reliability of the trait scale is 0.71 and 0.75 for males and females respectively at 30 days, and 0.68 and 0.65 for males and females respectively at 60 days. As for the STAIC, the state anxiety scale reliability is less than the trait scale, particularly for females. All trait items have item total correlations above 0.30, and 19 of the state items reach at least this level. Adequate validity has also been established for the STAI (Spielberger, 1983).

The manual provides norms for high school students, college students, working adults, and military recruits. The high school sample is based on the responses of 424 tenth grade students in regular class periods. While the STAI is devised for use with senior high school students, the manual also claims that it can be used with junior high school students (Spielberger, 1983). Brown et al. (1986) uses the STAI rather than the STAIC with their older groups of children.

As with the STAIC, there is evidence to support a factor structure for the STAI based upon positive and negative items. Items on Form Y trait anxiety include both positively and negatively valenced items, or anxiety present and anxiety absent items. This differs from the STAIC Trait scale, which has only anxiety present items. As a result of this the trait and state scales of the STAI are both two factor scales, and these factors represent the positively and negatively valenced items of the trait and state anxiety scales (Spielberger, 1983).

In conclusion, both the RCMAS and STAIC are adequate measures of anxiety in children, while the STAI is an adequate measure of anxiety in adolescents. The RCMAS has the advantage of providing assessment of anxiety across a wide age range and provides additional information through its subscales. The STAIC is not recommended for children above sixth grade and the adult version can be used to assess anxiety in upper high school students. The advantage of the STAIC and STAI is that they also provide state measures of anxiety, which are sensitive to transient fluctuations in anxiety which is important in any experiment assessing anxiety induction procedures.

Concluding comments

The current chapter has covered some important methodological issues in the study of anxiety and anxiety-induced cognitions. Consideration has been given to a number of methods of assessing cognition in children, and methods of categorising cognitions once they have been assessed. The use of imagery in inducing anxiety in children has also been discussed, as well as the three main self report measures of anxiety to be used in the thesis. The next chapter will now establish the research aims of the thesis. These will be based on the literature presented in Chapters 2, 3 and 4.

Chapter 5: Research Aims and Objectives

The aims of the thesis are based upon the research reviewed in the previous three chapters. The thesis will focus on anxiety-induced cognitions in children and adolescents from regular schools. Anxiety will be assessed via self report measures of anxiety.

It is clear that there is limited understanding of the role of cognition in anxiety in children and adolescents, and the manner in which the role of cognition varies across different age groups and between genders. Research into anxiety-induced cognitions in children is limited and has not followed an established route. Therefore there are many different methodologies for studying cognition in children, and little validation of these methods. Most studies of anxiety-related cognitions have used fear stimuli to induce anxiety, for example, test taking or going to the dentist. However, these stimulus situations may elicit differing levels of fear according to the age and gender of the sample. Thus it is impossible to measure whether the results are truly associated with developmental level or are a function of the developmental or gender differences in fears of the stimulus material. A consequence of this is that results may not be generalisable to different age groups, or between males and females.

The initial experiment in the thesis aims to establish a range of suitable stimulus items for inducing anxiety to measure the resultant cognitions. These items will be selected from the Fear Survey Schedule for Children II (FSSC-II; Gullone & King, 1992a) and will be reported with a notable level of fear and will not be affected by the grade level or gender of the participants. The stimulus items will each be selected from qualitatively different fear domains. Research has suggested that children and adults with high trait anxiety show increased anxiety responses to situations of social evaluative threat, so one item will be chosen to reflect social evaluative fear. Each item will also be significantly correlated with trait anxiety. The items selected from this experiment will therefore provide a theoretically sound basis from which to investigate the aims of the thesis.

The second experiment of the thesis will develop these fear items into scenarios which will be used to induce state anxiety in children. The scenarios will be presented to children and their resultant levels of state anxiety will be measured. Given that the fear items have been selected because they induce similar levels of fear across the age range, it is hypothesised that there will be no significant effect of grade on state anxiety responses to the scenarios which are developed on the basis of the fear items. Similarly, given that the items have been selected because they display no gender differences, then it is also hypothesised that there will be no gender differences in the reported levels of state anxiety in response to them. If this experiment establishes that the scenarios induce simular levels of state anxiety across the grades and between the genders, then a valid means of assessing changes in anxiety-induced cognitions across the age range and between genders will have been established.

As research has suggested that the state scale of the STAIC is a two factor scale when measured under baseline conditions, a subsidiary methodological hypothesis of this experiment is that this factor structure of the STAIC state scale will remain unchanged under induced state anxiety conditions. If the two factor structure can be reliably established using these data, state anxiety will be measured as a total scale and as two separate subscales in subsequent analyses, thus allowing greater understanding of the role of state anxiety in children and adolescents.

Experiment 2 will also measure cognitive responses to the scenarios via the think-aloud method, and utterances will be recorded and categorised according to whether they are 'positive statements', 'coping statements', 'internal threat statements' or 'external threat statements'. The initial and central aim of this second experiment is to investigate whether the output of the four cognitive categories is affected by grade or gender. On the basis of previous research it is hypothesised that there will be an increase in coping and threat statements as grade increases. Since there is no research which has provided any evidence regarding the developmental profile of positive statements, it is not possible to pose directional hypotheses regarding these types of cognitions. On the basis of previous research it is hypothesised that females will report higher levels of threat and coping statements, and males will report higher levels of positive statements.

The second central aim of experiment 2 is to investigate the correlations between measures of anxiety and cognitive output. It is hypothesised that coping and threat statements will be significantly positively correlated with state and trait anxiety. Since the research literature which addresses the relationship between anxiety and positive statements is divided, with one set of literature demonstrating a negative relationship between anxiety and positive statements, and another set demonstrating no link between the two, no directional hypothesis is posed regarding the relationship between positive statements and anxiety. Instead, further investigation of this issue will be conducted.

Previous research has suggested that the pattern of cognitions varies according to the stimulus situation. Experiment 2 will attempt to investigate further how the pattern of cognitions varies across the stimulus situations employed in this experiment. It is hypothesised that there will be a significant difference in the pattern of reported cognitions according to the anxiety-inducing scenario.

The third experiment of the thesis will aim to demonstrate a causal link between the various types of cognitions collected in experiment 2 and measures of state anxiety. Cognitions produced in experiment 2 will be selected from each of the four cognition categories, and inserted into one of the scenarios to produce four separate scenarios, each with a different type of cognition. The cognitions will be inserted into the anxiety-inducing scenarios as if the children are thinking these thoughts themselves. In effect this will take the dependent variables of cognitions measured in the previous experiment and turn them into independent variables to assess how effectively they induce anxiety in individuals. It is hypothesised that the positive statements scenario will induce significantly less state anxiety than the coping or threat scenarios. As these scenarios contain different cognitions, the effect of grade and gender on state anxiety responses to these scenarios will be investigated. It is hypothesised that there will be no effect of grade on state anxiety, and that females will report higher levels of state anxiety in response to the anxiety-inducing scenarios than males.

A checklist of cognitions will be developed, consisting of the cognitions in the four scenarios. The aim of this measure is to assess whether participants report back the cognitive content presented to them in the scenario and to assess how effectively the cognitive content of the scenarios has impacted upon the participants' reports of cognition. It is hypothesised that participants will report significantly more of the cognitions presented to them than the other categories of cognition. To establish convergent construct validity of the scale, it is hypothesised that trait anxiety will be significantly positively correlated with reported threat statements and coping statements on the checklist. The intercorrelations between the scales of the checklist will also be investigated. To establish the internal consistency of the scales of the checklist, intercorrelations between the scales will be measured. It is hypothesised that there will be positive correlations between the coping and threat scales of the checklist.

The data collected from this checklist will also be employed to assess the effects of grade and gender on reported cognitions. Again it is hypothesised that females will report significantly more coping and threat statements and significantly less positive statements. Additionally, the data collected from the cognitions checklist will be used to investigate further the relationship between anxiety and cognitions. As for experiment 2 it is hypothesised that there will be a significant positive relationship between state anxiety and reported threat and coping cognitions, and the relationship between positive statements and anxiety will be further investigated.

A methodological comment on Experiment 3 is that only one of the three scenarios from experiment 2 will be used. Experiment 4 will attempt to replicate and extend the findings of experiment 3.

A large number of statistical tests will be performed in the course of these experiments. It has been decided to use an alpha level of 0.05 to assess statistical significance. Type one errors will be controlled for by replicating the major findings in successive experiments, and by varying the methodology by changing the dependent variables of cognitive output measured in experiment 2, to independent variables in experiments 3 and 4.

This chapter has briefly outlined the major aims and hypotheses of the thesis. These aims and hypotheses will guide the four experiments which comprise the thesis. The following chapter presents the initial experiment of the thesis.

Chapter 6: Experiment 1- Selection of Stimulus Items

The preceding chapters have highlighted the need for research which assesses anxiety-related cognitions in children using stimuli which produce an equivalent level of fear across the age range. Many of children's fears change throughout development (e.g., Gullone & King, 1992b) and it is likely that if such fear stimuli are used to induce anxiety experimentally, they will produce different cognitive output at different developmental stages thus masking any true developmental differences in anxiety-induced cognitions.

The role of gender is also an important consideration in developing stimulus items to assess anxiety-related cognitions. Anxiety disorders symptomatology are over represented in girls (Kashani et al., 1989; Muris, Merckelbach, Mayer, & Meesters, 1998). Further, girls consistently report more fears than boys (e.g., Ferrari, 1986; Gullone & King, 1992b; Ollendick & King, 1991) and with girls there are higher correlations between self report of fear and self report of anxiety than with boys (Ollendick, 1983). This suggests that research which addresses anxiety-related cognitions should employ stimulus situations which show no significant gender differences so that any resultant cognitive output will be truly related to gender differences in cognitive output rather than differences in fear of the stimulus item.

This first experiment therefore attempts to establish a set of stimulus items which meet a number of criteria using items selected from the Fear Survey Schedule for Children (FSSC-II; Gullone & King, 1992a). As this experiment addresses methodological issues, it is not addressing particular hypotheses, but selecting items which meet certain criteria. The criteria for the selection of items are that:

1. They represent a range of fear domains in children;
2. They elicit no difference in the reported fears of children from grade 3 to grade 10;
3. They elicit no gender differences in fear responses; and
4. They are significantly correlated with trait anxiety.

Method

Participants

Participants were selected in whole class groups from three different primary schools and a high school. Children were selected from grades 3, 4, 5, 7 and 10, in order to sample a wide range of participants. For practical reasons is was difficult to be granted access to the same range of students in high school students. Children whose parents had not given consent did not participate in the experiment. A total of 311 students participated in the experiment, which was completed in a classroom setting. A breakdown of participants by grade and gender can be seen in table 1.1 below.

Table 1.1: Participants by grade and gender.

	Gender		
	Females	**Males**	**Total**
Grade			
3	30	37	67
4	32	33	65
5	20	28	48
7	24	40	64
10	30	37	67
Total	**136**	**175**	**311**

The average age for grade 3 students was 8 years 8 months (standard deviation 3.6 months), for grade 4 students was 9 years 4 months (standard deviation 3.5 months), for grade 5 students was 10 years 6 months (standard deviation 4.9 months), for grade 7 students was 12 years 5 months (standard deviation 5.8 months) and for grade 10 students was 15 years 4 months (standard deviation 4.6 months).

Measures

Students completed the FSSC-II (Gullone & King, 1992a). This instrument is a 78 item self report scale asking participants to report how scared they are of different items on a three point likert type scale (from 1, 'not scared' to 3 'very scared') so the lowest possible score on the FSSC-II is 78 if participants respond with 'not scared' to all items, and 234 if they respond with 'very scared' to all items. The FSSC-II was forwarded to the experimenter by the first author of the scale, and there are some slight differences between this instrument and the one reported in Gullone and King (1992a). Three extra items ('riding in a car or bus', 'going to the dentist' and 'having to go to school') are included in this scale (See Appendix A1).

All participants completed the trait scale of the STAIC (Spielberger, 1973) except the grade 10 students who completed the more age appropriate STAI (Spielberger, 1983). The STAIC is a 20 item scale, with items scored on a three point scale and a minimum score of 20 and maximum of 60. The STAI is also a 20 item scale, but is scored on a four point scale with a minimum of score of 20 and a maximum of 80.

Procedure

Participants completed both instruments in the normal classroom setting. The investigator read aloud the standard instructions followed by each item for the grade 3, grade 4 and grade 5 participants. Standard instructions for the STAIC allow the examiner to read items aloud when there is some doubt about the reading ability of the participants. See Appendix B1 for administration instructions.

Results

The results section of this chapter will address the four criteria for selection of stimulus items outlined in the introductory section of this chapter. Prior to this an outline of the data will be presented covering mean trait anxiety and mean fear scores by gender and grade.

Methodological Issues

Sample characteristics: trait anxiety

Mean STAI and STAIC trait anxiety scores and the T scores corresponding to these means for males and females across all grades are given in table 1.2 below. The T scores in the manual of the STAIC are calculated separately for gender across all grades, while the T scores for the STAI are calculated separately for gender on a sample grade 10 students.

Total mean trait anxiety on the STAIC was 32.10, with a standard deviation of 8.1. Further to this, 19% of females and 3.7% of males had STAIC trait scores above one standard deviation above the mean. In a normal population 16% of participants would be expected to have trait anxiety more than one standard deviation above the mean. A two way ANOVA for grade by gender was performed on STAIC trait anxiety raw scored, and there was a significant effect of grade [$F(4, 228)=2.90$ $p<0.05$], with trait anxiety increasing to grade 5 and then decreasing to grade 7, and gender [$F(1, 228)=15.74$, $p<0.05$] with females reporting more trait anxiety than males. There was no significant interaction between grade and gender [$F(3, 228)=0.11$, ns].

Total mean trait anxiety on the STAI was 42.25 with a standard deviation of 9.1. Grade 10 participants (STAI) had T scores of 53 and 51 for females and males respectively, placing them just within the average range. Twenty percent of females and 19% of males completing the STAI had scores more than one standard deviation above the mean. A t test revealed no gender differences in responses to the STAI [$t(59) = 1.41$, ns].

Table 1.2: Means, standard deviations (in parentheses), T scores and numbers for STAI and STAIC trait anxiety and means and standard deviations (in parentheses) for FSSC-II score by gender and grade.

STAI and STAIC Trait Anxiety Scores					
Gender	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 7**	**Grade 10**
Females	33.58 (8.7) T=45 n=30	34.75 (8.9) T=47 n=32	37.30 (7.5) T=50 n=20	32.70 (6.5) T=44 n=24	43.90 (8.7) T=53 n=30
Males	30.40 (7.8) T=39 n=37	30.82 (8.3) T=40 n=33	32.50 (7.8) T=42 n=28	28.23 (6.1) T=35 n=40	40.65 (9.3) T=51 n=37
Total	31.75 (8.3)	32.75 (8.8)	34.50 (8.0)	29.89 (6.6)	42.25 (9.1)
FSSC-II Scores					
Gender	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 7**	**Grade 10**
Females	137.82 (27.8) n=30	144.46 (32.6) n=32	145.89 (21.9) n=20	135.05 (19.6) n=24	124.29 (21.26) n=30
Males	116.03 (22.5) n=37	115.85 (28.3) n=33	124.79 (22.8) n=28	104.83 (16.7) n=40	108.21 (16.96) n=37
Total	125.08 (26.8)	130.42 (33.5)	134.12 (24.69)	117.52 (23.3)	115.47 (20.5)

Note that grade 10 students completed the STAI (which has a maximum score of 80) and the students in grades 3, 4, 5 and 7 completed the STAIC (which has a maximum score of 60). Note also that the T scores are those corresponding to the means of raw data, not the mean of individual T scores.

Table 1.2 also shows FSSC-II means and standard deviations by grade and gender. The level of reported fear generally increased to grade 5, and then decreased in grades 7 and 10. Mean scores also show that fear scores were higher in females than males. Analysis of variance on FSSC-II total by grade and gender revealed that both main effects were significant [$F(4, 253)= 5.54$, $p <0.05$ and $F(1, 253)=64.59$, $p<0.01$ respectively]. The interaction between grade and gender for FSSC-II was not significant [$F(3, 228)=0.84$, ns].

Table 1.3 outlines the correlations between trait anxiety scores and FSSC-II total scores for each grade separately and for males and females separately. Note that the correlations between fear scores and trait anxiety is lower in grade 10 participants than younger participants, perhaps reflecting the different trait anxiety measure employed with this group.

Table 1.3: Correlations between trait anxiety and fear scores.

	Sample	STAIC Trait	STAI Trait
	Grade 3	0.73** n=50	
	Grade 4	0.70** n=55	
FSSC-II Total	Grade 5	0.67** n=43	
	Grade 7	0.60** n=49	
	Grade 10		0.33* n=58
	Females	0.64** n=88	0.37, ns n=28
	Males	0.66** n=109	0.20, ns n=30

*p<0.05
** p<0.01

Selection of stimulus items

Factor analysis of FSSC-II items

A principal components factor analysis with varimax rotation was completed on all items of the FSSC-II for all 311 participants. Participants with missing data were deleted listwise leaving a total of 263 participants in the analysis. The Principal Components analysis accounted for 43% of the total variance, and extracted a total of five factors using Kaiser's criterion of factors, which extracts those factors with eigenvalues of greater than 1.00. Using a loading of +0.3 and above, this analysis revealed conceptually similar results to Gullone and King's

(1992a) study and the factors were given the same descriptors which can be seen in Table 1.4 below. The factors were 'fear of death and danger', 'fear of the unknown', 'fear of failure and criticism', 'psychic stress and medical fears' and 'animal fears'. Items that differed from the study by Gullone and King (1992a) are starred, and have their factor placement from this study noted after them.

Table 1.4: Principal components factor analysis rotated factor loadings for the 78 items of the FSSC-II.

				Factor		
Item		**I**	**II**	**III**	**IV**	**V**
	Factor 1: Fear of Death and Danger					
32	Myself dying	***0.69***	0.02	0.14	0.15	-0.02
31	Cyclones	***0.67***	0.20	0.06	-0.06	0.28
33	Being hit by a car or truck	***0.67***	0.11	0.10	0.13	0.13
38	Not being able to breathe	***0.66***	0.04	0.20	0.03	0.05
56	Earthquakes	***0.66***	0.20	-0.01	0.05	0.29
45	Someone in my family having an accident	***0.66***	0.22	0.27	0.03	-0.09
19	Murderers	***0.64***	0.21	0.07	0.10	0.03
28	Someone in my family dying	***0.62***	0.10	0.20	0.10	-0.10
22	Being kidnapped	***0.62***	0.25	0.06	0.11	0.14
36	Being threatened with a gun	***0.61***	0.21	0.10	0.14	0.16
51	A burglar breaking into our house	***0.60***	0.33	0.24	0.07	0.08
37	Bushfires	***0.60***	0.20	0.15	0.20	0.11
11	Our country being invaded	***0.59***	0.13	0.12	0.11	0.26
25	Fire	***0.59***	0.24	0.17	0.11	0.27
64	AIDS	***0.58***	0.12	0.14	0.08	0.02
43*	My parents separating or getting divorced (F&C)	***0.57***	0.29	0.26	-0.08	-0.09
14	Taking dangerous drugs	***0.57***	0.16	0.15	0.01	0.20
13	Nuclear war	***0.57***	0.10	0.09	0.02	0.28
23	Getting a serious illness	***0.55***	0.07	0.31	0.18	-0.11
77	Falling from high places	***0.55***	0.25	0.05	0.28	0.14
41*	Drunk people (U)	***0.52***	0.29	0.17	0.07	0.19
44	Getting an electric shock	***0.52***	0.21	0.02	0.02	0.12
48	Someone in my family getting sick	***0.44***	0.18	0.34	0.10	-0.20
17*	Violence on television (U)	***0.36***	0.19	0.05	0.17	0.16

	Factor 2: Fear of The Unknown (cont..)					
53	Being alone at home	0.30	***0.65***	0.23	0.03	-0.01
62*	Thunder (AF)	0.07	***0.63***	0.10	0.04	0.29
69*	Thunderstorms (AF)	0.10	***0.62***	0.10	0.00	0.29
75	Strangers	0.35	***0.62***	0.18	0.12	0.19
65	Creepy houses	0.25	***0.61***	0.25	0.28	0.09
49	Strange looking people	0.40	***0.57***	0.19	0.08	0.11
46	Getting lost in a crowd	0.40	***0.57***	-0.02	0.16	0.06
72	The sight of blood	0.23	***0.56***	0.12	0.14	0.10
3	Being alone	0.26	***0.54***	0.33	-0.01	0.02
52	Having bad dreams	0.25	***0.54***	0.20	0.20	0.03
68	Getting lost in strange places	0.45	***0.51***	0.15	0.13	0.13
67	Dead people	0.42	***0.49***	0.18	0.22	0.00
39*	Getting punished by my dad (F&C)	0.12	***0.46***	0.28	0.16	0.17
35	Ghosts or spooky things	0.24	***0.45***	0.11	0.14	0.17
12	Darkness	0.11	***0.44***	0.03	0.36	-0.21
70*	Cemeteries (AF)	0.30	***0.44***	0.14	0.41	-0.09
54*	Rats (AF)	0.09	***0.43***	0.21	0.34	0.33
34*	Being sent to the principal (F&C)	0.27	***0.39***	0.34	0.11	0.20
58*	Bees (AF)	0.10	***0.38***	0.19	0.31	0.35
8	Being in closed places	0.30	***0.32***	0.23	0.14	0.11
	Factor 3: Fear of Failure and Criticism					
24*	Meeting someone for first time (P&M)	0.09	0.03	***0.63***	0.25	0.07
10	Getting bad marks at school	0.15	0.05	***0.63***	0.05	0.28
47*	Having no friends (P&M)	0.36	0.17	***0.63***	0.00	-0.20
7*	Losing my friends (P&M)	0.30	0.07	***0.60***	0.01	-0.01
40	Failing a test	0.18	0.22	***0.56***	0.01	0.40
59	Sitting for a test	0.08	0.21	***0.49***	0.26	0.07
73	Looking foolish	0.17	0.37	***0.48***	0.11	0.00
20	My parents criticising me	0.22	0.13	***0.48***	0.01	0.15
1*	Being teased (U)	0.06	0.39	***0.45***	0.01	0.18
61	Getting my school report	0.10	0.16	***0.43***	0.40	0.03
5*	Riding in a car or bus (not in Gullone & King, 1992a)	0.21	0.37	***0.42***	-0.04	0.37
55*	Going to a new school (P&M)	0.18	0.28	***0.42***	0.28	0.08
29	Making mistakes	0.14	0.27	***0.42***	0.09	0.17
60*	Being bullied (U)	0.19	0.38	***0.40***	0.22	0.14
30	My parents arguing	0.31	0.33	***0.38***	0.01	0.05
21*	Being in a fight (U)	0.25	0.34	***0.36***	0.13	0.22
	Factor 4: Psychic stress and medical fears					
15*	Going to the dentist (not in Gullone & King, 1992a)	0.04	0.06	-0.04	***0.60***	0.04
9	Going to the doctor	0.14	0.02	0.15	***0.57***	0.00
57	Getting an injection from a nurse or doctor	0.25	0.35	0.02	***0.52***	0.07
16	Having to talk in front of my class	-0.04	-0.19	0.43	***0.50***	0.09
2*	Rides like the big dipper (U)	0.17	0.01	0.02	***0.47***	0.22
26*	Having an operation (D&D)	0.43	0.23	0.15	***0.45***	0.14
18	Spiders	0.14	0.25	0.23	***0.41***	0.13

	Factor 4: Psychic stress and medical fears (cont...)					
76	Having to go to hospital	0.37	0.39	0.08	***0.41***	0.11
63*	Lizards (A)	-0.06	0.20	0.00	***0.39***	0.33
74*	Flying in a plane (U)	0.02	0.16	0.08	***0.32***	0.28
6*	Mice (A)	-0.03	0.15	0.18	***0.31***	0.10
	Factor 5: Animal Fears					
66*	Tigers (D&D)	0.30	0.17	0.16	0.08	***0.55***
78*	Sharks (D&D)	0.45	0.17	0.03	0.20	***0.51***
71	Dingoes	0.31	0.23	0.20	0.05	***0.50***
42	Snakes	0.39	0.29	0.09	0.35	***0.45***
50*	Getting punished by my mum (F&C)	0.12	0.39	0.34	0.11	***0.40***
	Other					
4	Being criticised by others	0.06	0.02	0.07	0.11	0.24
27	Having to go to school	-0.16	0.12	-0.04	0.08	0.06

* Items which differ from the study by Gullone and King (1992a) where placement is shown as follows: D&D= Fear of death and danger factor, U= Fear of the unknown, F&C= Fear of failure and criticism P&M= Psychic stress and medical fears, A= Animal fears

Items with no significant effect of grade

Analyses of variance were completed for each FSSC-II item by grade. The results of these analyses can be seen in Appendix C1. Items which did not show a significant effect of grade were selected for further consideration, and ANOVAs were then conducted on each of these items for grade separately for males and females. The results of these analyses are presented in Appendix C2. Those items with no effect of grade for either males or females were again selected for further consideration. At this stage there were only 31 items which satisfied these selection criteria. Selected items were then analysed for gender differences using independent samples t tests and the results of these analyses are presented in Appendix C3. There were only two items which showed no significant gender differences: 'sitting for a test' and 'rides like the big dipper', and all other items showed significantly higher fear levels in females than in males.

Correlations between fear items and trait anxiety

All selected items were then correlated with trait anxiety scores. Correlation coefficients are presented below in Table 1.5. Note that all items correlate positively and significantly with STAIC trait anxiety, except for 'going to the doctor', although this item does correlate significantly and positively with STAI. Correlations between items and the STAI trait anxiety scores, that is all grade 10 students, were generally low and not significant, apart from some items in the 'Fear of the Unknown', 'Fear of Failure and Criticism' and 'Psychic Stress and Medical Fears' factors.

Table 1.5: Correlation between trait anxiety and fear items

Item		**STAIC Trait n=243**	**STAI Trait n=67**
	Factor 1: Far of Death and Danger		
13	Nuclear war	0.39**	0.01
23	Getting a serious illness	0.34**	0.05
38	Not being able to breathe	0.38**	0.01
45	Someone in my family having an accident	0.46**	0.16
48	Someone in my family getting sick	0.33**	0.09
64	AIDS	0.38**	0.11
	Factor 2: Fear of the Unknown		
8	Being in closed places	0.33**	0.10
21	Being in a fight	0.32**	0.27*
35	Ghosts or spooky things	0.33**	0.43**
54	Rats	0.31**	0.31*
62	Thunder	0.36**	-0.01
	Factor 3: Fear of Failure and Criticism		
1	Being teased	0.22**	0.37**
2	Rides like the big dipper	0.20**	0.06
7	Losing my friends	0.34**	0.24
29	Making mistakes	0.34**	0.25*
40	Failing a test	0.37**	-0.05
47	Having no friends	0.45**	0.08
55	Going to a new school	0.48**	0.18
59	Sitting for a test	0.28**	-0.10
60	Being bullied	0.32**	0.34**

	Factor 3: Fear of Failure and Criticism (Cont...)		
73	Looking foolish	0.48**	0.22
	Factor 4: Psychic stress and medical Fears		
9	Going to the doctor	0.13	0.35**
26	Having and operation	0.41**	0.05
63	Lizards	0.20**	0.09
70	Cemeteries	0.39**	0.29*
	Factor 5: Animal Fears		
78	Sharks	0.38**	0.07

* $p<0.05$
** $p<0.01$

Discussion

Methodological issues

Sample characteristics

All participants completed the STAIC or STAI (depending on their age) and the FSSC-II. T scores corresponding to the mean trait anxiety scores on the STAIC fell either at or below average. Males tended to fall at a lower level than females, and there were notably more females with scores more than one standard deviation above the mean than males. Mean STAIC trait anxiety overall was lower than those scores reported elsewhere for similar samples (Houston et al., 1984; Strauss et al., 1988). Trait anxiety peaked in grade 5 and decreased in grade 7. Gender differences in trait anxiety were also evident, with females reporting higher levels of trait anxiety, which is consistent with the manual for the STAIC (Spielberger, 1973).

Analyses then addressed the effect of grade and gender on FSSC-II. These analyses revealed that total fear scores increased to grade 5 and then decreased in grade 7 and 10. This profile is equivalent to the findings with the STAIC across grades. Gullone (1992) and Gullone and King (1992a) report an effect of age on the FSSC-II, but this is a consistent decrease in total fear scores across the grades. Females in the current experiment reported higher levels of fear than males, which is consistent with the findings of other studies (e.g., Ferrari, 1986; Gullone & King, 1992b; Ollendick & King, 1991). Overall the mean fear scores reported in the current experiment are lower than those reported by Gullone and King (1992a).

Criteria for stimulus selection

Selection criterion 1: fear domains

The first step in analysis was to establish the fear domains covered by the FSSC-II. Principal components factor analysis grouped the items into a five factor solution. Results of the factor analysis were generally consistent with the results obtained by Gullone and King (1992a). The five factors in the solutions were: 'Fear of Death and Danger', 'Fear of the Unknown', 'Fear of Failure and Criticism', 'Psychic Stress and Medical Fears', and 'Animal Fears'.

There was a number of differences between this experiment and Gullone and King (1992a) which may be attributable either to the lower number of participants or to the more restricted age range used in the current experiment. Of note, there were only 263 participants in this experiment ranging from 8 to 16 years of age, as opposed to 918 participants ranging from 7 to 18 years. Generally the differences did not cause conceptual difficulties for the factor structure. There was a number of other items which loaded equally on two factors, for example 'cemeteries' loaded almost equally on 'Fear of the Unknown' and 'Psychic Stress and Medical Fears'. Other items were not conceptually consistent with the factor upon which they loaded, for example, 'riding in a car or bus' came under 'Fear of Failure and Criticism'. Factor five, animal fears, had only five items, one of which was 'getting punished by my mum', which had a very low loading on this factor, and loaded almost equally with factor 2 (fear of the unknown) which is where 'getting punished by my dad' fell. 'Fear of Death and Danger' was the largest factor and consisted of a majority of the highly feared items.

Selection criterion 2: effect of grade

The second step in the analysis was to select those items which showed no significant effect of grade. There were 32 items which had no significant effect of grade overall and for males and females separately. These findings do not guarantee that the items will continue to show no effect of grade when they are translated into imagery scripts for future research; however it does serve to provide a strong empirical basis for their selection. This empirical basis has not been reported elsewhere in the literature.

Selection criterion 3: gender differences

The third step in the analysis was to find items which did not elicit gender differences. Results showed that for almost all items, females reported higher levels of fear than males. The two items which showed no effect of gender were 'sitting for a test' and 'rides like the big dipper', both of which were items with low fear scores, and therefore could not be considered for selection as anxiety stimuli. These gender differences in fear levels are consistent with previous research which suggests that females report higher levels of fear than males (e.g., Ferrari, 1986; Gullone & King, 1992b; Muris et al.; Ollendick & King, 1991). On the basis of these findings it appears that it is not possible to isolate items which show no significant difference between reported fear in males and females. Findings in future experiments will therefore need to take into account that females in general report higher levels of fear than males in response to the stimulus items.

Selection criterion 4: correlation with trait anxiety

The fourth and final step in the analysis was to correlate each of the selected fear items with trait anxiety scores, to assess the degree to which each item is related to trait anxiety. All but one of the items were significantly correlated with STAIC anxiety. Correlations with the STAI trait anxiety measures were less pronounced. This may in part due to the lower numbers of participants in these analyses. According to Cohen (1992), the correlations between anxiety and fear given in the results section of this chapter would fall between small and large, and could therefore be considered not only statistically significant, but also to varying degrees, clinically significant.

Other considerations

A number of items which are statistically suitable for use as anxiety-inducing stimuli in future research have been selected, and the practical and ethical issues of item selection will now be considered. Firstly, the selected items should not be too frightening for ethical reasons. Secondly they must be items which can practically be developed into standard imagery scenarios that will be applicable to all children. Finally they must be items which can elicit significant fear, without creating undue distress to the child. Items in the 'Fear of Death and Danger' factor are ruled out on ethical and practical grounds. All selected items in this factor were rated with relatively high fear scores (i.e., above 2.00), and consisted of items such as 'nuclear war', 'AIDS', 'not being able to breathe' and 'getting a serious illness', which could all cause significant distress to children, as they are items which pose a life threat to the child in some form. The remaining items 'someone in my family having an accident', and 'someone in my family getting sick' were considered too personal in nature. It would be difficult to write imagery scripts for these items which could be applied to all children. Selected items on the 'Fear of the Unknown' factor were rated at relatively low levels (below 1.50), and it is likely that these items would not induce significant levels of anxiety in participants, so they have also been ruled out. While the item 'being in a fight' was found to evoke a slightly higher level of fear, it was decided that this item would also pose some ethical difficulties on the basis that such an item could cause significant distress to a child, because it involves aggressive physical threat to the child.

Research has shown that social fears are good predictors of anxiety (e.g., Friedman et. al., 1991; Ollendick & Yule, 1990), so it is important that an item from the 'Fear of Failure and Criticism' factor be included. Many items in this factor had relatively low levels of reported fear (below 1.50), so these items are ruled. There were three items with relatively high levels of reported fear (above 2.00). These were 'losing my friends', 'having no friends' and 'going to a new school'. 'Having no friends' was selected as it had the highest level of reported fear, and would easily lend itself to imagery in children from a range of different grades. 'Having no friends' correlates with STAIC trait anxiety at a level which would be considered a large effect (Cohen 1992), but there was no correlation with STAI trait anxiety.

The 'Psychic Stress and Medical Fears' factor included only four items which met the statistical criteria explained earlier. Of these, 'having an operation' stood out as an item which would be a good selection for later research. The fear rating for 'having an operation' was relatively high, at 1.89. Because this item does not involve aggressive physical threat in the same manner as an item such as 'being in a fight' does, it was considered ethically suitable for the purposes of future research. 'Having an operation' correlates with STAIC trait anxiety at a level which would be considered a medium effect (Cohen, 1992) but does not correlate with the trait scale of the STAI.

'Sharks' is the only item from the 'Animal Fears' factor which is a possibility for use as an imagery item. While there may be some doubts about the use of an item with such a high fear rating, it was decided that 'sharks' could still be used as an imagery item if effective debriefing procedures are employed. The item would also be easily developed into a standard imagery scenario for children. The correlation of 'sharks' with the STAIC trait anxiety measure would be considered a medium effect (Cohen, 1992) but again there is no correlation between this item and STAI trait anxiety.

Conclusions

This chapter reported on the selection of a group of stimuli to used in later experiments to assess more accurately children's anxiety-related cognitions. This approach has not been reported elsewhere in the literature, and as such represents an important step toward developing a greater understanding of the developmental profile of anxiety and anxiety-related cognitions in children. The items which have been selected through this process ('having no friends', 'having an operation' and 'sharks') are from three qualitatively different factors, they show no effect of grade for either males or females and represent items that are significantly correlated with trait anxiety (at least for STAIC), with effect sizes that could be considered to fall between medium and large (Cohen, 1992). It is recognised that the items are not always significantly correlated with STAI trait anxiety, and that this may impact on the effect that these items have as anxiety inducing items in later studies. The items do however show significant gender differences. Chapter 7 will now address how these items were developed into imagery scenarios which were then used with children to stimulate cognitive responses to anxiety.

Chapter 7: Experiment 2- Think-aloud Production of Cognitions

Chapter 6 described the initial experiment in the thesis, which isolated three items from the FSSC-II to be used as the basis of the experiment described in this chapter. The items were 'having no friends', having an operation' and 'sharks'. These items represent three different fear domains, they show no effect of grade, and they are all correlated with trait anxiety. However females rate them as more fearful, as it was not possible to find appropriate items which had no gender differences. The present experiment aims to develop these items into imagery scenarios which will be used to induce anxiety in children as outlined in Chapter 4 (e.g., Hermecz & Melamed, 1984). After anxiety induction, this experiment will measure the resultant cognitions using the think-aloud method, which was discussed in Chapter 4.

Research into developmental changes in anxiety-related cognitions is still in its infancy. No research has attempted to investigate anxiety-related cognitions while controlling for developmental differences in fear associated with the stimulus items, so this experiment aims to fill this gap by using the items selected in the previous experiment. No studies addressing the developmental aspects of anxiety-related cognitions appear to use a think-aloud procedure to allow for more direct measurement of internal thoughts. While questions about the validity of the think-aloud method have been previously raised, Genest and Turk (1981) state that it is appropriate to use such less structured methods of assessment in the early stages of research. Most studies use self report measures, which limit the possible range of responses for children. There is some indication that as children develop cognitively, they develop the ability to see more possible responses to an anxiety producing situation, therefore producing more coping thoughts or worries (Brown et al., 1986; Vasey, 1993). There is also evidence to suggest that the pattern of cognitions reported by children changes as a function of the situation (Brown et al., 1986).

Literature which addresses the cognitive correlates of anxiety in children has revealed that anxiety in children is positively related to both internal and external threat cognitions (Fox et al., 1983; Houston et al., 1984; Prins, 1986; Zatz & Chassin, 1983, 1985) and to coping cognitions (Zatz & Chassin, 1985). As discussed in Chapter 4, the relationship between positive statements and anxiety is unclear. Some researchers have found evidence to suggest a negative relationship between positive statements and anxiety (e.g., Blankstein et al., 1992; Galassi et al., 1981; Zatz & Chassin, 1983, 1985), while others have found no relationship between them (Fox et al.; 1983, Prins et al., 1981). There is however some evidence to suggest that the pattern of cognitions reported by children varies as a function of the stimulus situation (Brown et al., 1986).

Studies which address the cognitive correlates of anxiety generally assess the role of trait anxiety. There have been few studies which assess how state anxiety correlates with cognition. There is research to show that STAIC state anxiety is not a unified scale, but is made up of two factors, which consist of the positive and negative items of the scale (Cross & Huberty, 1993; Dorr, 1981; Papay & Hedl, 1978). It is therefore important to clarify the role cognitions play in state anxiety, and further, how the two factor scales of the STAIC state anxiety scale are related to cognitions.

Using the think-aloud production method of measuring cognitions in response to the three selected stimuli items, three methodological hypotheses are posed:

1. That induced state anxiety will fall into two distinct factors representing the positive and negative items on the STAIC.
2. That state anxiety in response to the three scenarios will not significantly differ across the grades.
3. That females will report significantly higher levels of state anxiety in response to the anxiety-inducing scenarios.

Four theoretical hypotheses are also posed:

1. That there will be significant differences in the pattern of reported cognitions depending on which anxiety induction scenario is presented.
2. That there will be an increase in anxiety-induced cognitions as grade increases, particularly in the rates of threat and coping cognitions.
3. That females will report significantly more coping and threat cognitions and significantly less positive statements.
4. That threat and coping cognitions will be significantly positively correlated with state and trait anxiety. Since the evidence regarding the role of positive statements in anxiety is mixed, the relationship between anxiety and positive statements will be clarified.

Method

Participants

One hundred and twenty one students from grades 3, 5, 7 and 10 in two primary schools and one high school participated in the experiment on a voluntary basis, with parental consent. Table 2.1 shows the breakdown of participants by grade and gender.

Table 2.1: Participants by grade and gender

	Gender		
	Females	**Males**	**Total**
Grade			
3	16	16	32
5	15	16	31
7	15	16	31
10	13	14	27
Total	**59**	**62**	**121**

The average age for grade 3 students was 9 years 3 months (standard deviation 5.3 months), for grade 5 students was 10 years 9 months (standard deviation 5.6 months), for grade 7 students was 12 years 9 months (standard deviation 4.4 months) and for grade 10 students was 15 years 9 months (standard deviation 4 months).

Design

The experiment employed a 4 x 2 (grade x gender) factorial design, where each participant completed two of the three possible scenarios. While it would have been ideal for each participant to complete all three scenarios, practical considerations made this difficult, so each completed only two of the possible three which helped to guard against fatigue. Scenarios were presented in counterbalanced order.

Measures

Three instruments were used to measure anxiety. The Spielberger State Trait Anxiety Inventory for Children (STAIC, Spielberger, 1973) was employed to measure both state and trait anxiety in students from grades 3, 5 and 7. Because the STAIC is designed for use with children up to sixth grade, but allows some leeway in age, this scale was used for participants up to grade 7 and the adult version, the State Trait Anxiety Inventory (STAI, Spielberger, 1983) was used for the students in grade 10. This was similar to the age split used by Brown et al. (1986). The Revised Children's Manifest Anxiety Scale (RCMAS, Reynolds & Richmond, 1985) was employed as an additional instrument to measure anxiety in all age groups, and to clarify specific scales of anxiety. The scales of the RCMAS include the Physiological Anxiety Scale, the Worry/Over sensitivity Scale, the Social Concerns/ Concentration Scale and the Lie Scale. A shortened version of the Fear Survey Schedule for Children-II (FSSC-II, Gullone & King, 1992a, see Appendix A2) was employed to validate the findings of experiment 1 in relation to the fear responses to each of the chosen fear items. A visual imagery scale based upon Bett's QMI Vividness of Imagery Scale (Marks, 1989) was designed along similar lines to that used by Hermecz and Melamed (1984) to gain a measure of each student's self reported imagery of the stimulus items (see Appendices A3, A4 and A5).

Stimulus selection and development

Imagery scenarios were based on the selected FSSC-II items, and aimed to be applicable for children in all age groups investigated by the experiment. Each scenario developed the scene across four discrete sections, with the final section providing resolution to the anxiety-inducing situation. When read aloud, each section took approximately 75 seconds. All scenarios are included in Appendix B2. The scenarios were written from the participants perspective so that when read out loud they could imagine themselves in the anxiety-inducing situation. Using a similar method to Hermecz and Melamed (1984), physiological and emotional response cues of anxiety were used to more effectively stimulate anxiety responses in the children. Response cues were taken from items of the STAIC and RCMAS, and there were three physiological and three emotional cues in each section of the imagery scenario.

Procedure

Students were individually introduced to the researcher who explained the nature of the experiment (including explanation of the use of an audio tape recorder) and ensured that students were willing to continue. Students then completed the STAI or STAIC, the RCMAS and the shortened form of the FSSC-II. The investigator explained that she wanted the students to complete some imagination activities, with the aim of finding out what went through their minds, or what they said to themselves while they were imagining. Training was completed on a standard scene where students closed their eyes and imagined themselves waking up in bed on their birthday, then said out loud what they were thinking. Training continued until the participants were verbalising fluently.

For ethical reasons, screening questions were then asked of participants to ensure they were not presented with a situation that was likely to distress them unduly (see Appendix B2 for details). For example, in the shark scenario, participants were firstly asked if they were good swimmers, and if they swam at the beach. They were then asked if anything bad had ever happened to them or someone they knew while swimming. If they had experience of shark attack, they did not continue in the experiment. Similar questions were asked in the other scenarios, and only one participant was excluded from the experiment on this basis.

The students were then asked to sit back, close their eyes and imagine what they were told as clearly as if they were actually there. A similar method was used by Hermecz and Melamed (1984) where they asked participants to involve themselves actively in the image, 'as if they were really there'. After presentation of each section, participants were asked keep imagining the situation and to say out loud what was going through their mind. They were prompted to report more twice before moving on to the next section. This was the only control over the amount that participants reported. All verbalisations were audio taped. After completion of the scenario, students were asked to fill in the visual imagery scale and the state scale of the STAI or STAIC. Debriefing followed this. The same procedure was followed for the second scenario.

Verbalisations were transcribed verbatim and unitised (see Blackwell et al., 1985; Davison et al., 1983; Eifert & Lauterbach, 1987; Genest & Turk, 1981). Unitisation was completed on a 50% sample of the total data by the investigator and a trained rater. Interrater agreement was calculated at 97%, which is considered acceptable according to Hartmann (1977), who suggests that 80% agreement is sufficient in such circumstances. As the method showed acceptable reliability, the investigator unitised the remainder of the data alone.

Based on the literature with both adults and children (Fox et al., 1983; Houston et al., 1984; Ingram & Kendall, 1987; Prins, 1994; Vasey et al., 1994; Zatz & Chassin, 1985), four categories were developed against which to rate the unitised data, namely positive statements, coping statements, internal threat statements and external threat statements. These four categories relate to the aims of the experiment, however they did not account for all of the data collected. All other cognitive output is included under the category of 'uncategorisable', and included cognitions which could be classed as 'wishing', or 'information seeking'. Table 2.2 shows the four categories and gives the descriptors of these categories. A rater was trained by the major investigator for four one-hour sessions, until there was consensus on rating of cognitions, and then the two raters independently rated the 3 512 individual cognitions. Interrater reliability was calculated at Kappa = 0.732 ($p<0.05$). Hartmann (1977) suggests that kappa should exceed 0.60 for acceptable reliability to be established. Disagreements were discussed between the two raters and decisions made upon consensus agreement. Final data therefore consisted of a total score for each category of cognition for both scenarios for each participant.

Table 2.2: The four categories of cognition and descriptors

Category	Descriptor
1. Positive Statements: Positive statements related to self and abilities, positive affect and positive physiological states	
2. Coping Statements: Statements exploring possible actions in response to the situation, usually in the form of 'should I?' statements, and problem solving statements aimed at positive action to control the situation.	
3. External Threat Statements: Statements relating to negative aspects of the situation or anticipation of future negative events, including 'what if?' statements.	
4. Internal Threat Statements: Put down of self or abilities, and expression of negative affect or physiological states	

Results

The results section of this chapter deals initially with description of the sample employed in the experiment in terms of STAI, STAIC and RCMAS trait anxiety. The effectiveness of the anxiety induction is then assessed according to state anxiety levels. Methodological hypotheses along with other methodological issues are addressed in the next section. The theoretical hypotheses are addressed in the final section.

Methodological issues

Sample characteristics: trait anxiety

Mean STAIC, STAI and RCMAS anxiety scores and the T scores corresponding to these means for males and females across all grades are given in table 2.3 below. Note that the T scores in the manual of the STAIC are calculated on the basis of gender for a total group of students, the T scores for the STAI are also based on gender for a sample high school students, while T scores on the RCMAS are based on individual age and gender samples.

Total mean trait anxiety on the STAIC was 33.79, with a standard deviation of 6.7. T scores corresponding to the mean STAIC trait anxiety scores for female participants in grades 3 to 7 were 47, 49 and 45 respectively, and for males these scores were 37, 45 and 43 respectively. Also, 15% of females but only 2% of males had STAIC trait scores above one standard deviation above the mean. Again, in a normal population 16% would be expected to fall in this range. A two way ANOVA for grade by gender was performed on STAIC trait anxiety data, and there was no significant effect of grade [$F(2, 88)=2.32$, ns] or gender [$F(1, 88)= 2.82$, ns]. There was no significant interaction between age and gender [$F(2, 88)=2.08$, ns].

Total mean trait anxiety on the STAI was 41.00 with a standard deviation of 9.2. Mean scores for grade 10 participants (STAI) correspond to T scores of 60 and 53 for females and males respectively, placing them just within the average range. Also, 7% of females and 14% of males completing the STAI had scores which were more than one standard deviation above the mean. In a normal population, 16% would be expected to fall in this range. Analysis revealed no gender differences in responses to the STAI [$t(92) = 0.37$, ns].

Total mean trait anxiety on the RCMAS was 11.25, with a standard deviation of 6.0. For females the RCMAS T scores of the means were relatively stable around the mean of 50, with grade 7 female participants showing slightly higher trait anxiety than females in other grades, and males showing higher T scores than females. Percentages of scores falling above one standard deviation above the mean are not reported for the RCMAS, as there were only around 50 participants in each of the norm groups provided by the manual, which was considered insufficient to provide a valid picture of the sample. There was a significant effect of gender on RCMAS anxiety [$F(1, 104)=4.24$, $p<0.05$], but no effect of grade [$F(3, 105)=0.36$, ns]. The interaction between grade and gender was not significant [$F(3, 105)=0.30$, ns].

Table 2.3: Means, standard deviations (in parentheses), T scores and numbers for STAI and STAIC trait anxiety and RCMAS score by gender and grade.

STAI and STAIC Trait Anxiety Scores				
Gender	**Grade 3**	**Grade 5**	**Grade 7**	**Grade 10**
Females	35.19 (9.3) T=47 n=16	35.87 (4.4) T=49 n=15	33.73 (6.1) T=45 n=15	41.69 (8.8) T=60 n=13
Males	29.13 (5.5) T=37 n=16	35.44 (7.5) T=45 n=16	33.5 (4.4) T=43 n=16	40.36 (9.9) T=53 n=14
Total	**32.16 (8.1)**	**35.65 (6.1)**	**33.61 (5.2)**	**41.00 (9.2)**
RCMAS Scores				
Gender	**Grade 3**	**Grade 5**	**Grade 7**	**Grade 10**
Females	8.71 (5.7) T=45 n=16	10.07 (6.9) T=48 n=16	11.31 (4.5) T=53 n=16	10.21 (5.5) T=48 n=14
Males	12.88 (7.8) T=52 n=16	11.60 (3.7) T=54 n=15	13.07 (6.8) T=57 n=15	12.25 (4.8) T=57 n=13
Total	**10.93 (7.1)**	**10.83 (5.5)**	**12.16 (5.9)**	**10.95 (5.3)**

Note that grade 10 students completed the STAI (which has a maximum score of 80) and the students in grades 3, 5 and 7 completed the STAIC (which has a maximum score of 60). Note also that the T scores are those corresponding to the means of raw data, not the mean of individual T scores.

Effect of anxiety induction on state anxiety

Table 2.4 shows the mean scores for STAIC and STAI state anxiety scores by gender and grade after completion of each of the three scenarios. T scores corresponding to the means are also given, and these show that mean scores for almost all groups are at least two standard deviations over the mean (apart from males and females in the operation scenario). In a normal population, 16% would be expected to be more than one standard deviation above the mean. According to the STAIC norms, for the operation scenario, 97% of females and males had scores which were at least one standard deviation above the mean. For the friends scenario, 100% of females and 93% of males reported state anxiety within this range. For the shark scenario, 100% of females and 97% of males reported state anxiety within this range. For the STAI, 50% of females and 37% of males reported state anxiety which were more than one standard deviation above the mean in response to the operation scenario. For the friends scenario, 86% and 100% of participants reported state anxiety in this range, and for the shark scenario 90% of both males and females reported state anxiety more than one standard deviation above the mean.

Table 2.4: Mean STAIC and STAI state anxiety scores and standard deviations (in parentheses) across grades for all scenarios separately by gender.

Gender	Grade	Friends	Operation	Shark
Female	3	52.80 (4.9) T=79	50.73 (8.1) T=77	51.67(2.8) T=78
	5	51.30 (1.5) T=77	49.60 (6.6) T=76	53.27 (4.9) T=79
	7	52.11 (3.7) T=78	51.56 (6.3) T=78	56.00 (3.6) T=80
	10	67.43 (11.5) T=71	55.88 (12.2) T=62	68.90 (8.7) T=72
Male	3	47.70 (10.4) T=71	46.60 (9.2) T=71	50.10 (7.9) T=73
	5	48.00 (7.2) T=71	46.20 (7.3) T=70	51.80 (6.7) T=75
	7	48.22 (5.1) T=71	48.30 (7.4) T=71	52.92 (5.2) T=75
	10	69.00 (8.3) T=80	50.63 (13.2) T=62	66.50 (11.9) T=78

Note that grade 10 students completed the STAI, which has a maximum score of 80, and the students in grades 3, 5 and 7 completed the STAIC, which has a maximum score of 60.

Impact of grade and gender on state anxiety

Analyses of variance were completed on state anxiety responses to all scenarios by grade and gender. For the friends scenario, there was no significant effect of grade [$F(2,52)=0.05$, ns], but there was a significant effect of gender [$F(1, 52)=6.34$, $p<0.05$], with females reporting higher state anxiety. There was no interaction between grade and gender [$F(2, 52)=0.11$, ns] Similarly for the operation scenario, there was no significant effect of grade [$F(2,54)=0.53$, ns], but again there was a significant effect of gender [$F(1, 54)=3.35$, $p<0.05$], with females reporting higher state anxiety responses. There was no interaction between grade and gender [$F(2, 54)=0.02$, ns] for the operation scenario. State anxiety in response to the shark scenario showed no significant effect of grade or gender [$F(2,56)=2.20$, ns and $F(1, 56)=2.05$, ns respectively]. There was no interaction between grade and gender [$F(2, 56)=0.15$, ns] on state anxiety for the shark scenario. There were no significant gender differences in STAI state anxiety response to the operation, friends or shark scenarios [$t(14 =0.83$, ns; $t (14) =0.32$, ns; $t (18) =0.52$, ns respectively].

State anxiety factor structure

A principal components factor analysis was completed on the individual items of the STAIC to assess whether the data in this experiment represented a two factor structure. A total of 94 participants completed the state scale of the STAIC in response to two scenarios. Responses to both anxiety-inducing scenarios were analysed, making a total of 180 state anxiety responses in the analysis (eight STAIC state anxiety responses were either omitted due to missing data were not completed by the participants). A two factor solution (negative state and positive state) was found following varimax rotation and using Kaiser's criterion of factors, which extracts factors with eigenvalues of greater than 1.00, which accounted a total of 43.2% of the variance. Membership of the two factors was accounted for by the valence of the items, with factor one accounting for all negative items, and factor two accounting for all positive items. Table 2.5 shows the item loadings for each factor. The factors were named negative state anxiety (n-state) and positive state anxiety (p-state) to reflect the valence of the items that they represent.

Table 2.5: Principal components factor analysis with varimax rotated factor loadings for the 20 items of the state scale of the STAIC

Item Number and Description		**Factor**	
		I	**II**
	Factor 1: Negative State Anxiety		
11.	Frightened	***0.83***	0.11
7.	Scared	***0.82***	0.01
18.	Terrified	***0.74***	0.03
15.	Troubled	***0.70***	0.02
9.	Worried	***0.67***	0.27
19.	Mixed up	***0.64***	0.17
5.	Jittery	***0.62***	0.08
16.	Bothered	***0.60***	0.32
2.	Upset	***0.52***	0.29
4.	Nervous	***0.51***	0.12
	Factor 2: Positive State Anxiety		
14.	Good	0.14	***0.69***
17.	Nice	0.03	***0.66***
20.	Cheerful	0.05	***0.63***
13.	Sure	0.02	***0.59***
3.	Pleasant	0.24	***0.56***
6.	Rested	0.35	***0.54***
8.	Relaxed	0.43	***0.53***
12.	Happy	0.14	***0.49***
10.	Satisfied	0.04	***0.48***
1.	Calm	0.40	***0.47***

RCMAS Lie Scale

The Lie Scale has been correlated with all measures of trait and state anxiety. Results revealed that the Lie Scale correlated significantly and negatively with the trait scale of the STAIC (r=-0.24). There were no correlations between the Lie Scale and any of the state measures of anxiety in response to the scenarios. There were no significant correlations between the Lie Scale and any of the cognition categories.

Visual imagery scale

The visual imagery scale was correlated with the cognition categories using Spearman's rank order correlation. For the operation scenario, there was a significant positive correlation between the total cognitions reported, and the level of reported imagery of the scenario ($r=0.27$, $p<0.05$). For the friends and the shark scenarios, there were no significant correlations between the visual imagery scales and any measures of cognitions. There were no significant correlations between the visual imagery scales and measures of state or trait anxiety, or the RCMAS Lie Scale.

Replication of experiment 1 fear items

FSSC-II responses to the three target items (operation, friends or shark) were investigated in the same manner as they were in experiment 1, as the aim was to replicate the findings of experiment 1 in relation to the three stimuli items. First it was demonstrated that there were no significant effects of grade on any of the target items [$F(3, 112)=0.73$, ns for the operation item; $F(3, 109)=1.75$, ns for the friends item; $F(3, 112)=0.30$, ns for the shark item]. The effect of grade for males and females was then assessed separately. There were no effects of grade for any of the scenarios for females [$F(3, 54) =1.53$, ns; $F(3, 53) =0.24$, ns; $F(3, 54) =0.24$, ns respectively], there was no effect of grade on the operation or the shark scenario for males [$F(3, 54) =0.18$, ns and $F(3, 54) =0.79$, ns respectively] however, there was an effect of grade for males responses to the friends item [$F(3, 52)= 2.98$, $p<0.05$]. Post hoc analysis using LSD revealed that grade seven boys reported significantly higher levels of fear in response to the friends item than did males from any other grade. Gender differences were then assessed using t tests, and it was found that females reported significantly higher levels of fear in response to the operation and shark items [$t(114)= 4.16$, $p<0.05$ and $t(114)= 2.49$ $p<0.05$ respectively]. There was no gender difference in response to the friends item [$t(111)=0.27$, ns].

Theoretical issues

Cognition responses by scenario

Means and standard deviations have been calculated for each of the four cognition categories for all three scenarios and are reported in Table 2.6 below. These data represent the means of raw scores of participants on each of the categories for each scenario. Note that mean scores are low, and range from 0.06 for the positive statements in responses to the shark scenario to 6.76 for external threat cognitions in response to the operation scenario. There are high standard deviations for all categories, which reflect the large variance in the number of responses produced by students. Paired t-tests were used to explore the differences between response rates for different scenarios on each of the cognition types. Note that each participant completed only two of the three scenarios, so paired t tests measure the differences between each possible combination of two scenarios.

Table 2.6: Means and standard deviations (in parentheses) of reported cognitions for each scenario and differences between the scenarios.

Category	Friends mean (sd)	Operation mean (sd)	Shark mean (sd)	Significant Differences
1. Positive Statements	0.15 (0.5)	0.21 (0.6)	0.06 (0.29)	-
2. Coping statements	1.93 (2.8)	0.53 (1.3)	3.34 (2.8)	a t(34)=3.15* b t(37)=3.41* c t(38)=6.46*
3. External threat	3.22 (4.83)	3.76 (4.1)	3.24 (3.2)	-
4. Internal threat	2.90 (2.8)	2.76 (3.4)	2.68 (3.3)	b t(37)=2.74*

a significant difference between the friends and operation scenarios
b significant difference between the friends and shark scenarios
c significant difference between the shark and operation scenarios
*p<0.05

Grade and gender differences in cognition

Table 2.7 below shows the means and standard deviations for all four categories of cognition across the grades. To control for the differences in the total output of participants, analysis of covariance was completed on all data by grade and gender, using total number of cognitions as a covariate.

For the friends scenario, total number of cognitions was a significant covariate for all four categories of cognition [F(1,64)=15.05, p<0.05; F(1,64)=6.47, p<0.05; F(1,64)=83.36, p<0.05 and F(1,64)=17.56, p<0.05 for positive, coping, internal and external threat cognitions respectively]. There were no significant effects of grade or gender for any of the categories. For the operation scenario again the total number of cognitions was a significant covariate for all categories [F(1,67)=10.90, p<0.05; F(1,67)=7.66, p<0.05; F(1,67)=74.62, p<0.05 and F(1,67)=19.28, p<0.05 for positive, coping, internal and external threat cognitions respectively]. Again there were no significant effects of grade or gender for any of the categories. For the shark scenario, there was no main effect of the covariate total cognitions for positive statements [F(1, 70)=1.98, ns], but there was for coping statements, external threat cognitions and internal threat cognitions [F(1,70)=108.65, p<0.05; F(1,70)= 36.56 p<0.05 and F(1,70)= 43.15, p<0.05 respectively]. Again there were no effects of grade or gender on cognitions in response to the shark scenario.

Table 2.7: Means and standard deviations (in parentheses) of responses for each category of each scenario by grade.

Cognition	Grade Mean				ANOVA	
	3	5	7	10	Grade	Gender
Friends Data:						
Positive	0.00 (0.0)	0.25 (0.6)	0.11 (0.3)	0.25 (0.8)	F(3,64)=0.68	F(1,64)=2.40
Coping	1.67 (3.5)	1.60 (2.4)	2.37 (2.4)	2.13 (3.1)	F(3,64)=0.41	F(1,64)=0.43
External	2.11 (2.4)	4.40 (6.0)	2.32 (3.5)	4.06 (6.4)	F(3,64)=0.94	F(1,64)=0.01
Internal	3.11 (2.3)	2.85 (2.7)	2.11 (2.8)	3.69 (3.4)	F(3,64)=0.83	F(1,64)=0.92
Operation Data:						
Positive	0.05 (0.2)	0.15 (0.4)	0.45 (0.9)	0.19 (0.7)	F(3,67)=1.92	F(1,67)=1.55
Coping	0.90 (1.5)	0.00 (0.0)	0.60 (1.8)	0.63 (1.1)	F(3,67)=1.64	F(1,67)=0.33
External	3.80 (4.5)	3.20 (3.2)	3.00 (3.6)	5.38 (5.0)	F(3,67)=1.06	F(1,67)=0.02
Internal	2.35 (2.6)	2.20 (2.8)	2.35 (2.8)	4.50 (5.2)	F(3,67)=1.38	F(1,67)=0.58
Shark Data:						
Positive	0.00 (0.0)	0.05 (0.2)	0.10 (0.3)	0.11 (0.5)	F(3,70)=0.45	F(1, 70)=0.90
Coping	3.37 (2.9)	3.95 (2.9)	3.33 (2.9)	2.68 (2.7)	F(3,70)=0.90	F(1, 70)=0.00
External	3.63 (4.1)	2.55 (2.1)	2.81 (2.5)	4.05 (3.9)	F(3, 70)=1.73	F(1, 70)=2.37
Internal	3.00 (3.3)	2.20 (2.9)	3.14 (3.6)	2.37 (3.6)	F(3, 70)=0.40	F(1, 70)=0.22

Note that there are no significant effects in this table.

Correlations between anxiety and cognition

Correlational analyses using Spearman's rank order method were completed for each of the scenarios on each of the four cognition categories with RCMAS scores, STAIC trait, state and the two state factors (p-state and n-state), STAI trait and state anxiety. Correlations are given in Table 2.8 below.

Table 2.8: Correlations between number of cognitions, trait anxiety and state anxiety.

	RCMAS Total	RCMAS Physio	RCMAS Worry	RCMAS Social Con	STAIC Trait	STAIC State	STAIC P-State	STAIC N-State	STAI Trait	STAI State
Friends:	n=70	n=70	n=70	n=70	n=57	n=55	n=55	n=55	n=16	n=15
Positive	0.00	0.01	-0.08	0.11	0.13	0.07	0.01	-0.00	-0.50	-0.50
Coping	0.21	0.07	0.25*	0.19	0.12	-0.07	-0.27*	0.06	-0.21	-0.41
External	0.13	0.24*	0.12	-0.15	0.13	0.32	0.06	0.24	0.07	-0.41
Internal	0.08	0.17	0.12	-0.07	-0.01	0.09	0.03	-0.07	0.43	0.15
Operation:	n=69	n=69	n=69	n=69	n=60	n=59	n=59	n=59	n=16	n=16
Positive	-0.17	-0.19	-0.18	-0.09	-0.04	-0.03	-0.04	-0.04	-0.36	-0.25
Coping	0.25*	0.00	0.24*	0.31*	0.16	0.14	0.16	0.14	-0.16	-0.51*
External	0.11	-0.08	0.16	0.13	0.25	0.27*	0.17	0.15	0.21	-0.25
Internal	0.18	-0.00	0.30*	0.12	0.21	0.34*	0.14	0.25	0.19	0.36
Shark	n=73	n=73	n=73	n=73	n=60	n=60	n=60	n=60	n=19	n=19
Positive	0.09	-0.10	0.07	0.24*	0.06	-0.03	-0.23	-0.35*	0.11	-0.39
Coping	0.27*	-0.08	0.25*	0.27*	0.16	-0.01	-0.07	0.09	0.25	0.46*
External	0.16	0.11	0.21	-0.01	-0.05	0.30	0.25	0.24	0.04	0.25
Internal	0.24*	0.09	0.31*	0.09	-0.07	0.43*	-0.09	-0.06	0.44	-0.15

*$p<0.05$

Note 'Worry' refers to the Worry/Oversensitivity scale and 'Social Con' refers to the Social Concerns/Concentration scale.

Discussion

Methodological issues

Sample characteristics: Trait anxiety

Total mean scores on the STAI were generally equivalent to results reported elsewhere, although the STAIC trait score tended to be slightly lower than those reported elsewhere (Brown et al., 1986; Houston et al., 1984; Strauss et al., 1988). RCMAS mean scores are also slightly lower than other studies (see Strauss et al., 1988). Investigation of STAIC, STAI and RCMAS trait anxiety T scores of the means allows some assessment of the normality of the sample. Grade 10 participants' STAI T scores were just within one standard deviation of the mean. Participants in grades 3 through 7 however show lower T scores on the STAIC, with males in grade 3 reaching a T score of only 37, which is no longer within the normal range. Also, males showed an increase in trait anxiety on the STAIC across grades. The RCMAS manual provides different means for different ages and genders. T scores on the RCMAS appear contradictory to the STAIC, with all scores within one standard deviation of the mean, and no changes in trait anxiety across the age range. It is difficult to make comparisons between the two measures given the different style of T scores used in the manuals.

Effect of anxiety induction on state anxiety

Mean measures of state anxiety suggest that for the STAIC and the STAI, participants reported very high levels of state anxiety, with over 90% of participants reporting STAIC state anxiety more than one standard deviation above the mean for all three scenarios. Over 80% of participants reported STAI state anxiety more than one standard deviation above the mean in response to the shark and friends scenarios. Mean state anxiety scores were higher than baseline state anxiety scores on the STAIC reported elsewhere (Strauss et al., 1988), and also higher than mean state anxiety scores reported by children anticipating dental treatment (Heitkemper, Layne, & Sullivan, 1993). Given that trait anxiety scores were generally within one standard deviation of the mean, the high state anxiety results suggest that the anxiety induction procedure has been effective. In order to assess accurately how effectively the anxiety induction procedure impacted on state anxiety, a baseline measure of state anxiety would be required. The future experiments in the thesis will measure baseline state anxiety.

RCMAS Lie Scale

The RCMAS includes a validity scale know as the Lie Scale. Using a non-clinical sample, research has shown that while the scale does reflect social desirability, it does not correlate with the anxiety scales, and therefore it has been shown that high ratings on this scale do not contaminate responses to the RCMAS (Hagborg, 1991). Reynolds (1981) found that the Lie Scale correlated with the state scale of the STAIC, showing that children who are high on social desirability are less likely to report high levels of state anxiety. However, results from this experiment show that the Lie Scale correlated significantly and negatively with the STAIC trait anxiety, suggesting that those high on the Lie Scale reported lower levels of trait anxiety. To ensure that this did not affect production of cognitions, the Lie Scale was correlated with all four categories of cognitions and results showed that there were no significant correlations with any of these. Also, there were no significant correlations between the lie scale and state anxiety scores after exposure to the three scenarios, suggesting that the impact of social desirability disappears with the anxiety induction procedure.

Visual imagery scale

The visual imagery scale was introduced into this experiment to assess whether the clarity of visualisation had an impact upon the reporting of cognitions. Visual imagery correlated with the total number of reported cognitions only in the operation scenario, revealing that those who had clearer images of the scenario reported more cognitions. There were no other correlations, indicating that the level of imagery is not important to the reporting of cognitions. This in turn indicates that clarity of visualisation is not a particularly critical issue in the future study of anxiety-induced cognitions.

Replication of experiment 1 fear items

Participants were presented with the three target items embedded in a shortened version of the FSSC-II, to replicate the findings of experiment 1. Results again demonstrated that there was no effect of grade on any of the three target items, however, when assessed separately there was a significant effect of grade on the responses of males to the friends scenario, with grade 7 males reporting significantly higher levels of fear than other grades. Gender differences were again demonstrated on the shark and operation scenario, however, there were no gender differences in response to the friends scenario. These findings are not entirely consistent with the findings of experiment 1.

Hypothesis 1: state anxiety factor structure

The state anxiety scale of the STAIC has previously been shown to be a two factor scale comprising the positive items and the negative items of the scale (Cross & Huberty, 1993; Dorr, 1981; Papay & Hedl, 1978). Clark and Watson (1991) emphasised the different roles that positive and negative affect play in anxiety and depression, and it is possible that the two scales of the STAIC may lend some clarity to this issue. It was hypothesised that the factor structure of state anxiety would remain consistent with the previous findings in the area, despite the use of elevated levels of state anxiety. Individual items on the state scale of the STAIC were therefore analysed in a similar manner to Cross and Huberty (1993) using principal components factor analysis. Results supported the hypothesis and those of the previous researchers in the area (Cross & Huberty, 1993; Dorr, 1981; Papay & Hedl 1978) and revealed that the STAIC data in this study have a stable two factor structure which represents the positive and negative items of the STAIC. The factor loadings are not as clear cut as they are in the study by Cross and Huberty (1993), and this may be because items are all in response to anxiety-inducing situations. Cross and Huberty (1993) found that the relationship between state unhappiness (p-state) and state distress (n-state) was stronger when state unhappiness exceeded its mean, but since p-state and n-state are both high and probably exceed the mean of the data in the Cross and Huberty (1993) study, less clear cut factor loadings on some items are not unexpected. This analysis allowed for calculation of p-state and n-state anxiety scores for all participants in response to the various scenarios, and thus allowed further investigation of anxiety-induced cognitions in relation to positive state anxiety and negative state anxiety. These findings will be considered later.

Hypotheses 2 and 3: Impact of grade and gender on state anxiety

There was no significant effect of grade upon state anxiety responses, for males or females, which supports the hypothesis on which this experiment was based, that state anxiety would not be experienced at different levels in different age groups in response to the anxiety induction scenarios because of the selection of items which were not feared at different levels across the grades. These findings show that the stimuli items selected in experiment 1 have been effectively converted from fear items, to anxiety-inducing imagery, without losing the essential qualities for which they were chosen. On the basis of this finding, comparisons between cognitions at different grade levels in this study will accurately reflect grade differences. Any differences will be truly related to changes in the production of cognitions, rather than reflecting differences in the level of anxiety associated with the stimuli.

There were significant gender differences in state anxiety in response to the operation and friends scenarios, which supports the findings of experiment 1, showing that females reported higher levels of state anxiety in response to these scenarios than males. No gender difference was found in response to the shark scenario.

Theoretical issues

Hypothesis 1: Cognitive responses by scenario

Positive statements were reported at very low frequencies, with means below one for all scenarios. This is not unexpected given that the situations were intended to be anxiety inducing and each scenario included 18 anxiety cues from the STAIC and the RCMAS. Positive statements did not vary between situations. Mean coping statements were below one in the operation scenario, but four times this in the friends scenario, and over six times this in the shark scenario. This probably represents the differences in the nature of the situations. In the operation, there is little that the participant could do to cope with the situation, or to change it, while in the shark scenario there is a range of coping options, which include swimming away from the shark (which were in this situation coded as coping statements rather than escape cognitions, as they represented the main means of coping with the situation). Means for reported internal and external threat cognitions were higher than for the positive statements, and mean internal threat rates were generally higher than mean external threat. There were no significant differences in the mean number of external threat statements reported between the scenarios, while mean internal threat rates were higher for the friends than the shark scenario, perhaps reflecting the fact that the friends scenario involves greater threat to sense of self than the shark scenario.

These findings suggested that coping statements are the most likely to vary across situations, being reported more frequently in situations over which the individual may feel that they have more control. Brown et al. (1986) reported that different coping strategies were common to each situation in their study. While positive self talk was the most commonly reported in all situations, attention diversion was the second most common response to the dental situation, task orientation the second most common response to the class report and problem solving the second most common response to the personal stressor (Brown et al., 1986). So it seems unlikely that there is a clear pattern of cognitive responses common to all anxiety-inducing situations; it is more likely that children vary their responses to suit the demands of the situation.

Hypotheses 2 and 3: Grade and gender differences in cognition

Developmental differences in anxiety-related cognitions have been demonstrated in at least two other studies (Brown et al., 1986; Vasey, 1993) and on the basis of the findings of these studies it was hypothesised that there would be an increase in anxiety-induced cognitions as grade increased. The current experiment used three stimulus items selected because they produced no significant differences in reported fear across the age range, and when these stimuli situations were employed to induce anxiety, there were no differences in reported state anxiety. As previously explained, this provides a solid basis upon which to make comparisons of reported cognitions on the basis of grade level. The results of this current experiment provided no evidence for the existence of differences in the reported cognitions of children and adolescents on the basis of grade. Therefore, while threat statements, coping statements and positive statements were evident at all grade levels, there is no evidence to support the hypothesis that anxiety-induced cognitions increase as grade increases.

While research has not specifically addressed gender differences in anxiety-induced cognitions, it has been demonstrated that boys report significantly higher levels of positive evaluations than girls (Prins et al., 1994; Zatz & Chassin, 1985) and that girls are more likely to focus on negative affect and to report coping statements (Brown et al. 1986). The current experiment hypothesised that girls would report significantly more coping and threat statements, and that they would report significantly less positive statements. This hypothesis has not been supported on any of the cognitions categories for any of the three scenarios.

It is possible that the lack of grade and gender effects has been the result of the poor data set. Mean scores suggest that participants produced relatively few cognitions in response to the scenarios and the standard deviations reveal that there was a large amount of variance in the responses of participants. Therefore there is some doubt about the quality of the data, which may suggest that drawing any definitive conclusions from these data would be premature. It is not entirely clear why this experiment has had such difficulties with the think-aloud method, when others have not. It is possibly due to the way in which participants were given fairly free rein to report what they were thinking, and the use of two prompts the only means of controlling the output of participants. This could have led to the very large standard deviations. Most think-aloud studies do not clarify how they limit the data that they collect to avoid such problems with large variance. Future research must address this issue if the think-aloud procedure is to be used with any success. Analysis of covariance addressed some of these difficulties, by controlling for the total output of participants when assessing the effects of grade and gender on output, however future research is still needed to find an effective means of employing the think-aloud method with such a wide range of ages. Such research is beyond the bounds of the thesis, as the major aim is to investigate age differences in the presentation of anxiety and particularly the cognitive aspects of anxiety

Hypothesis 4: Correlations between anxiety and cognition

It was hypothesised that there would be a significant positive correlation between threat cognitions and anxiety. In the friends scenario there was a significant positive relationship found between external threat statements and the RCMAS Physiological Anxiety scale. In the operation scenario internal threat statements were positively correlated with both the Worry/Oversensitivity scale of the RCMAS and the STAIC state anxiety scale. The STAIC state anxiety scale also correlated positively with external threat statements. In the shark scenario internal threat statements correlated positively with the RCMAS total score and worry scale as well as the STAIC state anxiety scale. So it appears that threat statements, particularly internal threat statements, correlate positively with measures of anxiety.

It was also hypothesised that there would be a positive relationship between coping statements and anxiety. In the friends scenario coping statements were significantly positively correlated with worry; however they were negatively correlated with STAIC p-state anxiety. In the operation scenario, coping statements were significantly positively correlated with the RCMAS total score, Worry/Oversensitivity scale and the Social Concerns/Concentration scale, but negatively correlated with STAI state anxiety. Finally in the Shark scenario coping statements were correlated with the RCMAS total score, Worry/Oversensitivity scale and the Social Concerns/Concentration, only this time they were positively correlated with the STAI state anxiety scale. These results suggest that coping statements are positively correlated with trait anxiety, particularly as measured by the RCMAS and its subscales, but that the relationship between coping statements and state anxiety is less clear. In the operation and friends scenarios, there are negative relationships between state anxiety and coping statements; however in the shark scenario, this relationship is positive.

These results suggest that reported coping and threat statements correlate most consistently with the worry scale of the RCMAS. This finding is consistent with previous research. Mattison, Bagnato, and Brubaker (1988) reported that the worry scale of the RCMAS significantly distinguished a group of anxiety disordered children from a psychiatric control group, and that the worry scale showed the highest mean t-score for the anxiety group. Lonigan, Carey, and Finch (1994) also suggested that worry represents the purest anxiety factor in the RCMAS.

Finally, no hypothesis was proposed regarding the relationship between positive statements and anxiety because of the conflicting evidence in this area. Given the very low rates of positive statements reported in all scenarios, it is difficult to attach too much significance to the findings in this set of data. No relationships were found between any measures of anxiety and positive statements in the friends scenario, or the operation scenario. In the shark scenario, there was a significant *positive* correlation between positive statements and the RCMAS social concerns/oversensitivity scale, and a significant negative correlation between positive statements and the n-state scale of the STAIC. In the shark scenario, the rates of positive statements are at their lowest, with no positive statements reported by grade 3 participants in response to this scenario, and a mean of no more than 0.12 for the other grades. It is therefore possible that the findings regarding positive statements are spurious.

It appears that there is evidence to support a positive relationship of anxiety with threat statements and coping statements (although this may be limited to trait anxiety). Future research could therefore address the causal relationship between these cognitions and anxiety. If supportive evidence can be found to show that anxiety can be induced by certain types of cognition then this will serve to strengthen the link between experimental research and clinical outcome studies in the area of anxiety in children.

Conclusions

Using the think-aloud production method of measuring cognitions in response to the three selected stimuli items, this experiment has tested three major methodological hypotheses and four major theoretical hypotheses. Results have supported the two methodological hypotheses and have revealed the following:

1. Items on the STAIC state anxiety scale fall into two distinct factors representing the positive and negative items when the levels of anxiety are

high. These findings are consistent with the findings of previous research using baseline measures of state anxiety.

2. State anxiety in response to the three scenarios does not significantly differ across the grades.
3. Females reported significantly higher state anxiety in response to the operation and friends scenarios.

Not all of the theoretical hypotheses have been supported in this study.

1. The first theoretical hypothesis was supported, and shows that there are significant differences in the pattern of children's and adolescent's cognitions according to anxiety induction scenario. These differences occurred mainly with the coping cognitions, and the levels of coping cognitions appeared to reflect the amount of control that could be exerted over the different situations.
2. There was no significant effect of grade on any of the four measures of cognition, thus the second hypothesis was not supported.
3. There were no gender differences in the number of any of the cognition categories, thus the third hypothesis was not supported.
4. There was some support for the next hypothesis. There were significant positive correlations between threat statements and anxiety, and between coping statements and at least trait anxiety. Results suggest that cognitions in response to the operation scenario show the strongest and most consistent correlations with measures of anxiety. Because of the very low reports of

positive statements, this experiment has not been able to assess effectively the link between positive statements and anxiety.

This experiment has provided no evidence of developmental differences or gender differences in the report of anxiety-induced cognitions. There is however evidence to support the relationship between various types of cognition and anxiety. The think-aloud method of measuring cognitions has produced data of questionable validity. The next experiment will therefore attempt to circumvent the problems with this method of cognition measurement by reporting back to children the various categories of cognitive output collected in this experiment and measuring the resultant levels of state anxiety. This method will change the cognition data from dependent variables to independent variables, and therefore provide a means of assessing the causal link between anxiety and cognition. It will also attempt to investigate further developmental changes in the presentation of anxiety and its resultant cognitions.

Chapter 8: Experiment 3- Causal Effects of Positive, Coping and Threat Statements

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Experiment 2 used a think-aloud method to measure cognition after exposure to three anxiety-inducing scenarios. State anxiety was effectively induced using these stimuli and the level remained consistent across grades, thus providing an equivalent basis from which to compare cognitive output of the various grades. No significant effects of grade were evident in the cognitive responses to any of the anxiety-inducing scenarios. Cognitive responses varied according to the stimulus situation, particularly the number of coping statements. There were correlations between threat statements and anxiety, and between coping statements and anxiety although these were generally low. The operation scenario showed the clearest and most consistent correlations of anxiety with coping and threat statements.

The data collected in the previous experiment revealed difficulties with the use of the think-aloud method. Given these difficulties, the current experiment aims to circumvent these by presenting to children selections of each of the four cognition categories reported in the previous experiment including internal threat statements, external threat statements, coping statements and positive statements. So, the cognitive output measured in experiment 2 will be employed as independent variables in the current experiment to assess the causative effect of these cognitions on state anxiety. A self report measure of the resultant cognitions will also be included to measure reported cognitions during the anxiety induction procedure.

As with the previous experiment, the hypotheses of the current experiment address both the methodological and theoretical issues under investigation. In experiment 2 the second hypothesis assessed whether there was any impact of grade on state anxiety, which established that the scenarios had equivalent impact on state anxiety for all grades, thus providing a methodological basis from which to assess any changes in cognitive output across the grades. Because this experiment does not primarily assess cognitive output in response to the scenarios, but assesses state anxiety in response to the four different scenarios, levels of state anxiety at different grades become of theoretical interest. So, the hypotheses of this experiment vary slightly in accordance with this change of focus. Also, state anxiety will be analysed for total scale and the two subscale scores. Given these considerations, the methodological hypotheses of this experiment are as follows:

1. On a thoughts checklist (TCL), participants will report significantly more cognitions on the scale corresponding to the scenario condition with which they were presented than cognitions on the other three scales.
2. That the internal threat statements, external threat statements and coping statements scales of the TCL will be significantly positively correlated with measures of trait anxiety and that the positive statements scale of the TCL will not be significantly correlated with measures of trait anxiety.

3. That the coping statements, internal threat statements and external threat statements scales of the TCL will be significantly positively correlated with each other, and will be unrelated to the positive statements scale.

Six theoretical hypotheses are also posed:

1. Based on the previous study, it is hypothesised that there will be no effect of grade on the level of state anxiety induced by the four scenarios, however, since these scenarios contain four different categories of cognition, it is possible that participants of different grades will respond differently to the scenarios.
2. Given the previous findings regarding gender differences, it is also hypothesised that female participants will report higher levels of state anxiety in response to the scenarios.
3. Participants presented with the positive statements imagery scenario will report lower levels of state anxiety than those in the coping or threat scenario conditions.
4. Based on the previous experiment, there will be no effect of grade on the number of reported cognitions in response to the scenarios.
5. Females will report more threat and coping statements and less positive statements on the TCL.
6. There will be significant positive correlations between state anxiety and the number of reported coping and threat cognitions. The role of positive statements in anxiety has not been clarified in experiment 2, so this

experiment will investigate further the relationship of state anxiety to positive statements.

Method

Participants

Three hundred and eleven students from four primary schools and two high schools participated in this experiment on a voluntary basis with parent consent. Table 3.1 shows a breakdown of these participants by grade and gender. All participants completed the experimental scenario, plus the neutral scenario, unless time constraints did not allow them to complete the neutral scenario. Average age for grade 3 participants was 9 years and 2 months (standard deviation 4.4 months), for grade 5 participants 11 years (standard deviation 3.6 months), for grade 7 participants 13 years and 1 months (standard deviation 4.8 months) and for grade 10 participants 15 years and 11 months (standard deviation 3.7 months).

Table 3.1: Participants by grade and gender.

	Gender		
	Females	**Males**	**Total**
Grade			
3	41	43	84
5	37	40	77
7	32	41	73
10	40	37	77
Total	**150**	**161**	**311**

Design

The experiment employed a 4 x 2 x 4 (grade by gender by cognition presentation condition) factorial design. Cognition presentation conditions were positive statements, coping statements, internal threat statements and external threat statements. The experiment was based on the responses to one scenario, namely the operation scenario. Participants were therefore presented with one of four variations on the operation scenario, each containing the same descriptive material, but differing in the cognitive content. Measures were also taken of baseline state anxiety, and state anxiety in response to a neutral scenario (walking down the street). Experimental and neutral scenarios were presented in counterbalanced order.

Each of the four conditions of the operation scenario employed either positive statements, coping statements, external threat statements or internal threat statements and were presented within the operation scenario, as this showed the strongest correlations with measures of anxiety in experiment 2. Scenarios were presented from the child's view, as in experiment 2, and gave the cognitions as if they were the child's own. It was suggested in the discussion of experiment 2 that the inclusion of response cues from the RCMAS and the STAIC may have impacted upon cognition production in some manner. The present experiment therefore deletes the anxiety cues from the operation scenario, and replaces them with cognitions.

Measures

As with the previous two experiments the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985), the State Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973) and the State Trait Anxiety Inventory (STAI, Spielberger, 1983) were employed to assess trait and state anxiety.

A cognitions checklist entitled the Thoughts Checklist (TCL) based on the CCAQ (Zatz & Chassin. 1983; 1985) was designed to assess reported cognitions after presentation of the anxiety-inducing scenario. It consisted of the 40 items used in the four operation conditions, so there were 10 positive statements, 10 coping statements, 10 internal threat statements and 10 external threat statements. Participants responded either 'yes' or 'no' in response to each item according to whether they thought it or not during the operation scenario. Children therefore received a score ranging from 1 to 10 on each of the four scales for this self report measure. (see Appendix A6).

As this checklist has been designed for the experiment, some validity checks will be completed. Given what has previously been outlined in the literature review of the thesis about the relationships between various types of cognitions, there should be positive relationships between the internal threat statements, external threat statements and coping statements scales of the measure, as these all appear to play a similar role in anxiety and are consistently positively related to it (for example, Zatz & Chassin, 1985). While there is some uncertainty about the exact role of positive statements in anxiety, it is clear that positive statements do not play the same role in anxiety as coping statements or threat statements, so there should either be no relationship between the positive statements scale and the other three scales, or alternatively, there will be a negative relationships between the measures.

External reliability must also be established between the checklist and other established measures of anxiety. Again, coping and threat statements have been found to be positively related to anxiety, so there should be positive relationships between these scales and measures of anxiety. Outcomes related to the positive statements scale again are difficult to predict.

Stimulus development

The operation scenario from the previous experiment was used as a basis for the stimulus material in this experiment. All anxiety cues were removed from the original operation scenario. Ten cognitions of each type (positive statements, coping statements, internal threat statements and external threat statements) were selected from the actual reports of children from the previous experiment. These represented commonly reported self talk of children in response to the operation scenario in each of the categories. The end result of this process was four conditions of the operation scenario, each sharing the same basic operation story, but each representing a different pattern of cognition. A neutral scenario was developed around the situation of 'walking down your street'. This scenario contained no response cues nor cognitions, consisting of stimulus material only. Scripts for the operation scenario and the neutral scenario can be found in Appendix B3.

Procedure

The experiment was conducted in small groups. Grade 3 participants worked in smaller groups of no more than four, and the size of the groups became larger with older participants. Grade 10 participants generally worked in groups of around seven or eight. Participants first completed the RCMAS and then the STAIC or STAI (both state and trait versions). This gave two measures of trait anxiety and one measure of baseline state anxiety. As with the previous experiment, questionnaires were read out to those who had difficulty with reading.

It was then explained to participants that they were required to 'do some imagining'. Prior to the experimental imagery, participants practised with the birthday scene as they had in the previous experiment. They were asked to close their eyes and imagine that they were waking up on their birthday. Those students who had difficulty imagining this situation were told to listen to the voice of the experimenter and try to imagine, but not to be concerned if they had difficulties (note that the previous experiment revealed that clarity of visualisation had little impact on reported cognitions). They were then given either the operation scenario for their condition (i.e., positive statements, coping statements, internal threat or external threat) or the neutral scenario.

After the imagery activity, children completed a STAIC or STAI state measure according to how they felt while they were imagining being in the operating theatre, or walking down their street. After the operation scenario, they completed the TCL, and particular emphasis was placed on the instruction which stated that this was about what they had been *thinking* while they were imagining, as opposed to how they had been *feeling*, as Glass and Arnkoff (1982) suggest that items of self statement questionnaires can be interpreted as affective rather than cognitive. All participants were debriefed following the activity. They then completed the second imagery scenario.

Results

The results section of this chapter is divided into a methodological and a theoretical section. The methodological section initially gives descriptive information regarding the population employed in the experiment in terms of trait anxiety. The effectiveness of the anxiety induction procedure is also investigated in terms of STAI and STAIC state anxiety. Hypotheses related to the validity of the TCL are then investigated. The theoretical section then addresses the theoretical hypotheses of the experiment. Since trait anxiety is related to levels of state anxiety and cognitions, and the reporting of these is likely to vary according to an individual's level of trait anxiety, all analyses assessing state anxiety and cognitions have taken trait anxiety into account, either through calculating partial correlations, hierarchical regression analyses or analysis of covariance.

Methodological issues

Sample description: trait anxiety

Mean trait anxiety scores for males and females across all grades are given in table 3.2 below, and the T scores which correspond to these mean scores are also provided to gauge the representativeness of the sample. T scores for the STAI were based on a high school sample for males and females separately, and these results suggest that grade 10 participants reported higher levels of trait anxiety on the STAI than the younger participants completing the STAIC (which were based on a total primary school sample for males and females separately). On the STAI, 13.5 % of males and 22.5% of females had scores more than one standard deviation above the mean, while on the STAIC 21.8% of females and 8.9% males were within this range.

A two way ANOVA was completed on STAIC trait anxiety for grade and gender. There was no significant effect of gender on STAIC trait anxiety scores [$F(1, 228)=3.07$ ns], however, there was a main effect of grade on STAIC [$F(2, 228)=6.83$, $p<0.05$], with trait anxiety decreasing across the grades. There was no significant interaction between grade and gender on STAIC trait anxiety [$F(2, 228)=0.25$, ns]. There was no gender difference for STAI trait anxiety [$t(75)=1.78$, ns]. Trait anxiety levels were also assessed according to presentation condition of the scenario to ensure that the experimental groups were equivalent. A one way ANOVA revealed that there was no significant effect of presentation condition on trait anxiety [$F(3, 233)=0.88$, ns for STAIC and $F(3, 76)=0.66$, ns for STAI]; therefore the experimental groups were equivalent in trait anxiety levels.

Table 3.2 also gives mean scores and the corresponding T scores for the RCMAS. T scores were based on individual norms for each age group and gender using a white population. T scores showed that mean RCMAS scores for males and females all fell within the average range. Two way ANOVA for grade and gender on the RCMAS revealed that there was a significant effect of grade [$F(3, 302)=5.95$, $p<0.05$], with anxiety decreasing as grade increased, and also a significant effect of gender, with females showing significantly higher anxiety than males [$F(1, 302)=18.64$, $p<0.05$]. There was no significant interaction between grade and gender on RCMAS anxiety [$F(3, 302)=0.31$, ns]. As for STAIC trait anxiety, RCMAS trait anxiety levels were assessed according to presentation condition of the scenario and an ANOVA revealed that there was no significant effect of presentation condition on RCMAS trait anxiety [$F(3, 309)=0.94$, ns], therefore the experimental groups were also equivalent in RCMAS trait anxiety levels.

Table 3.2: Means, standard deviations (in parentheses), T scores and numbers for STAI and STAIC trait anxiety and RCMAS score by gender and grade.

STAI and STAIC Trait Anxiety Scores				
Gender	**Grade 3**	**Grade 5**	**Grade 7**	**Grade 10**
Females	37.50 (8.9) T=50 n=41	36.68 (9.2) T=50 n=37	32.50 (7.1) T=43 n=32	45.55 (9.1) T=69 n=40
Males	34.92 (6.0) T=45 n=41	34.91 (6.7) T=45 n=40	31.63 (7.0) T=42 n=41	42.14 (7.7) T=60 n=37
Total	36.18 (7.6)	35.76 (8.0)	32.01 (7.0)	43.91 (8.6)
RCMAS Scores				
Gender	**Grade 3**	**Grade 5**	**Grade 7**	**Grade 10**
Females	14.32 (6.3) T=53 n=41	13.65 (6.3) T=53 n=37	10.59 (7.3) T=53 n=32	12.98 (6.2) T=54 n=40
Males	11.52 (6.0) T=51 n=43	11.38 (6.1) T=52 n=40	7.66 (6.0) T=48 n=41	8.86 (4.9) T=53 n=37
Total	12.90 (6.3)	12.47 (6.3)	8.95 (6.7)	11.00 (5.9)

Note that grade 10 students completed the STAI and the students in grades 3, 5 and 7 completed the STAIC.

Baseline, neutral and operation state anxiety

Table 3.3 gives mean scores for the STAIC and STAI state anxiety scale and also includes the corresponding T scores for these mean scores. Scores cover baseline state anxiety, state anxiety in responses to the operation scenario and state anxiety in response to the neutral scenario. State anxiety responses to the operation scenario will be investigated according to presentation condition at a later point.

Baseline state anxiety was assessed according to gender and grade using ANOVA. There was no main effect of grade or gender [$F(2, 224)=0.26$, ns for grade and $F(1, 224)=0.26$, ns for gender], however there was a significant interaction between the two factors [$F(2, 224)=3.93$, $p<0.05$] with males showing a peak in state anxiety in grade 5, and females showing a trough in state anxiety in grade 5. Baseline state anxiety was also assessed according to presentation condition, to ensure further that the experimental groups were equivalent. ANOVA results revealed that there was no significant effect of presentation condition on baseline state anxiety [$F(3, 229)=0.54$ for STAIC and $F(3, 76)=0.61$, ns for STAI].

According to the T scores corresponding to the means, baseline STAI and STAIC state anxiety scores were slightly below the population mean given in the manual for state anxiety, suggesting that participants were responding normally, or were even slightly more relaxed than the norm. In a normal population, 16% of participants would report state anxiety more than one standard deviation above the mean, and for this sample, 8.5% of females and 9.7% of males on the STAIC were in this upper range, while for the STAI, there 7.5% of females and 13.5% of males were within this upper range.

Operation results were then analysed by grade and gender. There were significant main effects of grade [$F(2, 228)=6.20$, $p<0.05$] and gender [$F(1, 228)=25.05$, $p<0.05$] on the STAIC state anxiety. There was a significant effect of gender on STAI state anxiety in response to the operation scenario [$t(74)=3.26$, $p<0.05$].

Neutral state anxiety was also assessed in this manner. T scores of mean neutral state anxiety showed that responses were at or slightly below average. Six point six percent of females and 9.6% of males for STAIC state anxiety and 2.6% females and 0% of males for STAI state anxiety reported state anxiety greater than one standard deviation above the mean.

ANOVAs were completed for grade and gender on neutral state anxiety. Results showed that there was no significant main effect of gender [$F(1, 200)=0.02$] on neutral state anxiety, but that there was a significant main effect of grade [$F(2, 200)=3.36$, $p<0.05$], with mean scores revealing that state anxiety in response to the neutral scenario decreased with age. There was no significant interaction between grade and gender on the neutral scenario [$F(2, 200)=0.53$, ns]. There was no significant effect of gender on STAI neutral state anxiety [$t(69)=0.33$, ns].

Effect of anxiety induction on state anxiety

T scores corresponding to the means for state anxiety in response to the operation scenario show that responses were well above the mean responses to the state anxiety inventory for males and females in all grades. The percentage of participants reporting state anxiety over one standard deviation above the mean is 85.5% of females and 65.3% of males responding to the STAIC and 77.5% of females and 58.3% of males responding to the STAI.

Paired t-tests were completed between measures of baseline state anxiety and operation state anxiety. In all cases state anxiety was significantly higher for the operation than the baseline measure [$t(229)=19.93$, $p<0.05$ for STAIC state anxiety and $t(75)=11.17$, $p<0.05$ for STAI state anxiety]. The same was true of the comparisons between operation and neutral state anxiety responses [t(205)=20.22, p<0.05 for STAIC state anxiety, and t(69)=15.26, p<0.05 for STAI state anxiety]. Paired t-tests were also used to assess differences between the baseline and neutral measures of anxiety. In all cases there were significantly lower levels of state anxiety for the neutral scenario compared with the baseline measure for anxiety [t(205)=4.94, p<0.05 for STAIC state anxiety and t(70)=5.51, p<0.05 for STAI state anxiety].

Table 3.3: Mean STAIC and STAI state anxiety scores, standard deviations(in parentheses) and T scores for all presentation conditions by gender and grade.

		Baseline	Operation	Neutral
Female	**3**	28.19 (5.9) T=44	50.32 (11.0) T=76	27.37 (7.9) T=42
	5	27.65 (5.2) T=44	50.30 (9.2) T=76	26.43 (6.6) T=40
	7	30.63 (6.1) T=49	44.13 (11.0) T=69	25.41 (4.8) T=39
	10	38.92 (9.7) T=49	59.53 (9.8) T=64	30.89 (10.24) T=29
Male	**3**	29.05 (5.2) T=48	39.05 (10.9) T=63	28.50 (9.6) T=46
	5	30.00 (6.4) T=51	45.45 (10.6) T=69	26.35 (6.7) T=42
	7	27.90 (4.7) T=46	39.46 (10.4) T=63	23.94 (4.2) T=37
	10	36.68 (10.1) T=44	51.17 (12.6) T=62	30.18 (7.7) T=18

Note that grade 10 students completed the STAI, which has a maximum score of 80, and the students in grades 3, 5 and 7 completed the STAIC, which has a maximum score of 60.

TCL responses by scenario presentation condition

Analyses of covariance were completed on all four scales of the TCL by presentation condition using RCMAS anxiety as a covariate. Table 3.4 presents mean scores on the four scales of the checklist for each scenario presentation condition. RCMAS anxiety was not a significant covariate for TCL positive statements [F(1, 290)=2.48, ns] , and there was a significant main effect of scenario presentation condition on positive statements, with post hoc analysis revealing that participants in the positive statements presentation condition reported significantly higher levels of TCL positive statements than those in the coping and internal threat presentation conditions. RCMAS anxiety was a significant covariate for TCL coping statements [F(1, 290)=21.94, p<0.05], and there was no significant effect of presentation condition on the coping scale. RCMAS anxiety was a significant covariate for TCL external threat [F(1, 290)=52.35, p<0.05] however there was no main effect of presentation condition on this scale. Finally, RCMAS anxiety was a significant covariate for TCL internal threat statements [F(1, 290)=41.82, p<0.05], and there a main effect of presentation condition remained on this scale after the covariate was taken into account with post hoc analysis revealing that participants in the coping and internal threat presentation conditions reported higher levels of TCL internal threat cognitions than those in the positive or external threat conditions.

Table 3.4: Mean TCL scale scores and standard deviations (in parentheses) for each presentation condition.

	Scenario Presentation Condition				
	Positive	**Coping**	**External**	**Internal**	**F Score**
TCL Scale					
Positive	5.80 (3.1)	4.79 (2.9)	4.99 (2.9)	4.36 (3.1)	F(3, 290)=2.98*
Coping	5.23 (2.1)	5.79 (2.4)	5.25 (2.6)	5.23 (2.5)	F(3, 290)=1.11
External	3.92 (2.8)	4.92 (2.8)	4.36 (2.7)	5.24 (2.9)	F(3, 290)=2.47
Internal	4.85 (3.5)	6.51 (3.3)	5.05 (3.1)	6.26 (3.1)	F(3, 290)=4.86*

*p<0.05

Correlations between TCL scales and trait anxiety measures

Table 3.5 shows correlations between each scale of the TCL and measures of trait anxiety. From this table it can be seen that the positive statements scale has no correlation with any measure of trait anxiety. The coping statements scale on the other hand correlated positively with all measures of anxiety. Internal and external threat measures show positive correlations with the STAIC and the RCMAS, but not with the STAI, which may be due to the size of the STAI sample.

Table 3.5: Trait anxiety measures correlated with the four scales of the TCL

	Cognition Checklist Scales			
	Positive	**Coping**	**Internal**	**External**
Anxiety Measures				
STAIC n=226	r=0.08	r=0.24*	r=0.43*	r=0.34*
STAI n=70	r=0.03	r=0.29*	r=0.19	r=0.23
RCMAS n=295	r=0.10	r=0.27*	r=0.40*	r=0.37*

*=p<0.05

Intercorrelations between TCL scales

Table 3.6 shows intercorrelations between the scales and shows that the positive statements scale correlated negatively with both of the threat statements scales, but positively with the coping statements scale. The coping statements scale correlated positively with the internal threat statements and the external threat statements scales and the two threat statements scales correlate positively with each other. Partial correlations have also been calculated which control for trait anxiety as measured by RCMAS, and these partial correlations are essentially the same as the initial correlations, indicating that trait anxiety is not a significant contributor to the relationship between the four scales.

Table 3.6: Correlations (r) and partial correlations (r_p, controlling for RCMAS trait anxiety) between the four TCL scales

	Cognition Checklist Scales			
	Positive	**Coping**	**External**	**Internal**
TCL Scales				
Positive	**r=1.00**	r=0.14*	r=-0.31*	r=-0.44*
Coping	r_p=0.18*	**r=1.00**	r=0.45*	r=0.44*
External	r_p=-0.30*	r_p=0.39*	**r=1.00**	r=0.68*
Internal	r_p=-0.44*	r_p=0.39*	r_p=0.62*	**r=1.00**

*=p<0.05
Note that r= Pearson's correlations and r_p = partial correlations controlling for the effects of trait anxiety as measured by RCMAS

Theoretical issues

Operation state anxiety by grade, gender and presentation condition

Means and standard deviations for STAIC state, p-state and n-state anxiety in response to the operation scenario are presented in Table 3.7 by grade and presentation condition. Initially STAIC state anxiety data were investigated using a three way ANCOVA for grade by gender by presentation type, with STAIC trait anxiety as a covariate. This analysis revealed that trait anxiety was a significant covariate [F(1, 209)=7.00, p<0.05]. Main effects for all factors were significant despite this [F(2, 209)=5.47, p<0.05 for grade; F(1, 209)=26.09, p<0.05 for gender and F(3,209=10.18, p<0.05 for presentation type]. Mean scores suggest that state anxiety actually peaks in grade 5, and is lowest in grade 7, that it is highest in females and that state anxiety is lowest in the positive statements presentation condition, but that there is no marked difference between the other three presentation conditions. There were no significant interactions between grade and cognition, gender and cognition or gender and grade [$F(6, 209)=1.65$, ns and $F(3, 209)=1.16$, ns; $F(2, 209)=2.71$, ns].

As there was no significant effect of gender on baseline data, but a significant effect of gender on operation data, a change variable was calculated to reflect the increase in state anxiety between baseline and induced state anxiety and a one way analysis of covariance for gender was completed on this data by gender using STAIC trait anxiety as the covariate. Results indicated that trait anxiety was not a significant covariate in this case [$F(1, 229)=1.71$, ns], but that there was a significant effect of gender [$F(1, 229)=23.63$, $p<0.05$]. This effect is illustrated in Figure 3.1 below.

There were similar findings for p-state anxiety, with trait anxiety being non-significant as a covariate [$F(1, 231)=0.00$, ns], but gender being a significant main effect [$F(1, 231)=23.63$, $p<0.05$]. For n-state anxiety, STAIC trait anxiety was once again a non-significant covariate [$F(1, 231)=1.88$, ns] and the main effect of gender was significant [$F(1, 231)=17.82$, $p<0.05$]. The effects of gender on the amount of change from baseline to induced anxiety for n-state anxiety and p-state anxiety were essentially the same as the interaction for total state anxiety which is illustrated below in Figure 3.1.

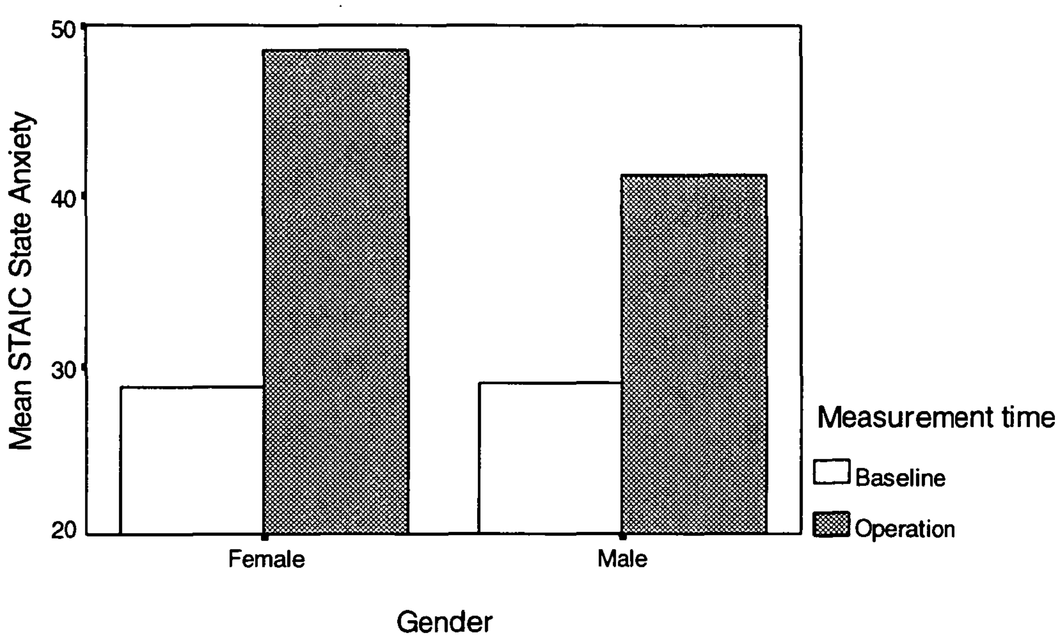

Figure 3.1: Effect of anxiety induction on state anxiety scores for males and females.

A three way ANCOVA was completed on the p-state data, with STAIC trait anxiety as a covariate. Trait anxiety was not a significant covariate [$F(1, 209)=0.90$, ns]. There were significant main effects of grade, presentation type and gender [$F(2, 233)=3.11$, $p<0.05$, $F(3, 233)=5.40$, $p<0.05$ and $F(1, 233)=12.79$, $p<0.05$ respectively]. There were no significant interactions between any of the factors [$F(6, 233)=0.85$, ns for grade by presentation, $F(2, 233)=1.21$, ns for grade by gender and $F(3, 233)=1.82$, ns for presentation by gender]. Mean scores revealed that p-state anxiety peaks in grade 5, that the positive statements presentation condition induces less state anxiety than the other three conditions and that females report higher levels of p-state anxiety than males.

A three way ANCOVA was conducted on the n-state data. STAIC trait anxiety was a significant covariate [$F(1, 209)=7.16$, $p<0.05$]. There were significant main effects of grade, presentation condition and gender [F(2, 209)=8.44, p<0.05, F(3, 209)=7.82, p<0.05 and F(3, 209)=19.53, p<0.05 respectively]. Mean scores shows that n-state anxiety remains fairly constant in grades 3 and 5 and then decreases in grade 7, that n-state scores are lower in the positive statements presentation condition and that females report higher levels of n-state anxiety than males. There were no significant interactions between any of the factors [F(6, 209)=1.14, ns for grade by presentation condition, F(2, 209)=2.40, ns for grade by gender, and F(3, 209)=1.50, ns for presentation condition by gender].

Table 3.7: Means and standard deviations (in parentheses) for STAIC total state, p-state and n-state anxiety by grade and presentation condition for the operation scenario.

	Scenario Presentation Condition				
	Positive	**Coping**	**External**	**Internal**	**Total**
Grade					
Total State Anxiety					
3	43.05 (11.3)	45.55 (12.8)	42.55 (14.0)	46.57 (11.2)	**44.55 (12.3)**
5	40.21 (9.7)	49.55 (9.7)	51.32 (9.1)	49.95 (8.8)	**47.78 (10.2)**
7	32.41 (9.1)	43.61 (9.8)	42.90 (11.0)	46.44 (8.5)	**41.51 (10.9**
Total	**38.78 (10.9)**	**46.30 (11.1)**	**45.49 (12.1)**	**47.60 (9.7)**	**44.66 (11.4)**
P-state Anxiety					
3	23.05 (4.3)	24.23 (6.4)	23.55 (7.4)	25.70 (5.2)	**24.20 (5.9)**
5	24.11 (6.7)	27.25 (5.3)	27.37 (4.7)	26.84 (3.6)	**26.40 (5.3)**
7	20.76 (8.0)	25.94 (4.2)	25.50 (5.6)	26.50 (3.7)	**24.75 (5.9)**
Total	**22.71 (6.5)**	**25.75 (5.5)**	**25.44 (6.1)**	**26.30 (4.3)**	**25.10 (5.8)**
N-state Anxiety					
3	19.53 (6.8)	21.36 (7.1)	19.95 (9.1)	20.43 (6.4)	**20.36 (7.3)**
5	17.16 (5.7)	22.25 (5.1)	23.95 (5.2)	23.05 (6.0)	**21.61 (6.0)**
7	12.88 (4.0)	17.83 (6.6)	17.35 (6.0)	19.94 (6.4)	**17.07 (6.3)**
Total	**16.65 (6.2)**	**20.60 (6.5)**	**20.36 (7.4)**	**21.12 (6.3)**	**19.74 (6.8)**

STAI state anxiety scores were then investigated using ANCOVA. Mean scores for STAI anxiety by presentation condition are presented in Table 3.8 below. Trait anxiety was a significant covariate [F(1, 67)=6.14, p<0.05]. There was a significant main effect of gender [F(1, 67)=9.76, p<0.05], but not of presentation condition [F(3, 67)=1.42, ns]. There was no significant interaction between gender and presentation condition [F(3, 67)=1.46, ns]. Mean scores revealed that again females reported more state anxiety than males. Analysis of covariance was then conducted on the change between baseline and induced state anxiety, using STAI trait anxiety as a covariate. Trait anxiety was not a significant covariate [F(1, 73)=0.07, ns], and the effect of gender on the change variable was not significant [F(1, 73)=3.12, ns].

Table 3.8: Means and standard deviations (in parentheses) for STAI state anxiety by presentation condition.

Scenario Presentation Condition				
Positive	**Coping**	**External**	**Internal**	**Total**
53.26 (13.3)	58.33 (12.0)	55.53 (13.2)	55.30 (9.0)	55.57 (11.9)

TCL positive statements scale by grade, gender and presentation condition

Table 3.9 presents mean TCL positive statements scales by grade and presentation condition. A three way ANCOVA was conducted on TCL positive statements scale which assessed the effect of grade, presentation condition and gender, with RCMAS anxiety as a covariate. RCMAS anxiety was not a significant covariate [F(1, 262)=0.32, ns]. There was no significant effect of grade on TCL positive statements [F(2, 262)=2.23, ns], and no significant effect of gender [F(3, 262)=3.08, p<0.05], but a significant effect of presentation condition [F(1, 262)=4.00, p<0.05]. Mean scores show that there were more positive statements reported in the positive statements presentation condition than the other three conditions. There were no significant interactions between any of the factors [F(9, 262)=1.43, ns for grade by presentation condition, F(3, 262)=0.86, ns, for grade by gender and F(3, 262)=0.61, ns for presentation condition by gender].

Table 3.9: Mean (and standard deviations in parentheses) responses to the TCL positive statements scale across the four scenario presentation conditions by grade.

	Scenario Presentation Condition				
	Positive	**Coping**	**External**	**Internal**	**Total**
Grade					
3	5.32 (3.5)	5.59 (3.1)	4.53 (3.4)	4.87 (3.3)	**5.11 (3.3)**
5	5.37 (3.0)	3.50 (2.7)	4.95 (3.0)	3.12 (3.3)	**4.25 (3.1)**
7	6.88 (2.7)	5.35 (2.9)	5.55 (2.7)	4.06 (3.4)	**5.44 (3.0)**
10	5.74 (3.3)	4.67 (2.7)	4.79 (2.7)	5.10 (2.4)	**5.11 (2.8)**
Total	**5.80 (3.1)**	**4.79 (2.9)**	**4.99 (2.9)**	**4.36 (3.1)**	**4.98 (3.1)**

TCL coping statements scale by grade, gender and presentation condition

Table 3.10 shows the mean scores for the coping statements scale of the TCL by grade and presentation condition. A three way ANCOVA assessed the effect of grade, gender and presentation condition on the coping statements scale with RCMAS as a covariate. RCMAS was a significant covariate [F(1, 262)=9.45, p<0.05]. There was a significant main effect of gender [F(1, 262)=8.65, p<0.05], with females reporting more coping statements than males. There was no significant effect of presentation condition or grade [F(3, 262)=0.87, ns and F(2, 262)=0.68, ns respectively]. None of the two way interactions were significant [F(3, 262)=1.69, ns for grade by gender, F(9, 262)=1.62, ns for grade by presentation condition and F(3, 262)=1.83, ns for gender by presentation condition].

Table 3.10: Mean (and standard deviations in parentheses) responses to the TCL coping statements scale across the four scenario presentation conditions.

	Scenario Presentation Condition				
	Positive	**Coping**	**External**	**Internal**	**Total**
Grade					
3	5.37 (2.5)	6.27 (2.9)	4.13 (3.0)	5.91 (2.0)	**5.54 (2.6)**
5	5.79 (2.1)	6.55 (1.8)	6.00 (1.9)	3.88 (2.8)	**5.61 (2.3)**
7	4.47 (1.9)	4.82 (2.4)	4.95 (2.4)	5.33 (2.8)	**4.90 (2.4)**
10	5.21 (2.0)	5.00 (2.0)	5.68 (2.7)	5.50 (2.3)	**5.39 (2.2)**
Total	**5.23 (2.1)**	**5.79 (2.4)**	**5.25 (2.6)**	**5.23 (2.5)**	5.37 (2.4)

TCL external threat statements scale by grade, gender and presentation condition

Table 3.11 shows mean TCL external threat statements scales across grades for the four presentation conditions. A three way ANCOVA was completed for grade by presentation condition by gender with RCMAS anxiety as a covariate. RCMAS was a significant covariate [$F(1, 262)=32.99$, $p<0.05$]. There was no significant effect of grade on TCL external threat cognitions [$F(3, 262)=0.85$, ns] nor gender [$F(1, 262)=1.56$, ns]. There was a significant effect of presentation condition [$F(3, 262)=3.03$, $p<0.05$]. There were no significant interactions between any of the variables [$F(9, 262)=1.66$, ns for grade by presentation condition, $F(3, 262)=2.32$ for grade by gender, and $F(3, 262)=1.29$, ns for gender by presentation condition].

Table 3.11: Mean (and standard deviations in parentheses) responses to the TCL external threat statements scale across the four scenario presentation conditions.

	Scenario Presentation Condition				
	Positive	**Coping**	**External**	**Internal**	**Total**
Grade					
3	4.95 (2.8)	5.41 (3.2)	3.07 (3.0)	5.57 (2.3)	4.90 (2.9)
5	4.11 (2.8)	6.00 (2.2)	5.47 (2.3)	4.65 (2.9)	5.08 (2.6)
7	2.65 (1.8)	4.00 (2.8)	3.80 (2.9)	5.83 (3.8)	4.08 (3.1)
10	3.84 (3.3)	3.50 (1.8)	4.84 (2.4)	4.85 (2.5)	4.34 (2.6)
Total	**3.92 (2.8)**	**4.92 (2.8)**	**4.36 (2.7)**	**5.24 (2.9)**	**4.61 (2.8)**

TCL internal threat statements scale by grade, gender and presentation condition

Finally Table 3.12 presents mean TCL internal threat statements scales scores across the four presentation conditions and for all grades. A three way ANCOVA with RCMAS anxiety as the covariate was used to analyse the data. This analysis revealed that anxiety was a significant covariate [$F(1, 262)=28.18$, $p<0.05$]. There was a significant effect of presentation type and gender on the TCL internal threat statements scale [$F(3, 262)=4.59$, $p<0.05$, $F(1, 262)=5.10$, $p<0.05$]. The main effect of grade was not significant [$F(1, 262)=2.34$, ns]. Mean scores show that females reported higher levels of internal threat cognitions than males, and that there were higher levels of internal threat cognitions reported in the internal threat condition and the coping condition than other conditions. There were no significant interactions between any of the factors [$F(9, 262)=1.27$, ns for grade by presentation condition, $F(3, 262)=2.10$ for grade by gender and $F(3, 262)=0.93$ ns for presentation condition by gender].

Table 3.12: Mean (and standard deviations in parentheses) responses to the TCL internal threat statements scale across the four scenario presentation conditions.

	Scenario Presentation Condition				
	Positive	**Coping**	**External**	**Internal**	**Total**
Grade					
3	5.32 (3.8)	6.36 (3.6)	3.67 (3.4)	6.26 (3.4)	**5.57 (3.6)**
5	5.16 (3.6)	8.35 (2.8)	6.84 (2.8)	5.82 (3.3)	**6.59 (3.3)**
7	3.41 (3.0)	5.12 (3.3)	4.35 (3.1)	6.50 (3.4)	**4.85 (3.3)**
10	5.37 (3.4)	5.67 (2.1)	5.11 (2.6)	6.40 (2.1)	**5.64 (2.7)**
Total	**4.85 (3.5)**	**6.51 (3.3)**	**5.05 (3.1)**	**6.26 (3.1)**	**5.67 (3.3)**

Correlations between reported cognitions and state anxiety

Table 3.13 below reports the correlations between the STAIC and STAI state anxiety and p-state and n-state subscales with the TCL scales. Hierarchical regression analyses were performed to assess whether state anxiety was still significantly correlated with the TCL subscales after allowing for trait anxiety, and possible interactions between state and trait anxiety in making additional contributions were also assessed. None of the contributions of the interactions were significant. Part correlations which were calculated through these regression analyses are included in this table. As can be seen from these results, the initial correlations with state anxiety were all significant with the exception of the correlation between STAI state anxiety and coping statements. Note that all correlations between the positive statements scale of the TCL and measures of state anxiety are negative. There were no notable differences between these correlations and the part correlations, which all remained significant after allowing for the effect of trait anxiety. Accordingly trait anxiety does not significantly alter the relationship between state anxiety and scores on the scales of the TCL.

Table 3.13: Correlations (r) and part correlations (r_p, controlling for STAI or STAIC trait anxiety) between state anxiety measures on the STAI, STAIC (total, p-state and n-state) and the scales of the TCL.

	Cognition Checklist Scales			
	Positive	**Coping**	**External**	**Internal**
State Anxiety				
STAIC	r=-0.46*	r=0.38*	r=0.58*	r=0.79*
n=226	r_p=-0.45*	r_p=0.33*	r_p=0.49*	r_p=0.73*
P-state	r=-0.39*	r=0.27*	r=0.43*	r=0.63*
n=226	r_p=-0.39*	r_p=0.25*	r_p=0.38*	r_p=0.59*
N-state	r=-0.45*	r=0.37*	r=0.57*	r=0.73*
n=226	r_p=-0.45*	r_p=0.32*	r_p=0.48*	r_p=0.67*
STAI	r=-0.41*	r=0.18	r=0.50*	r=0.56*
n=70	r_p=-0.44*	r_p=0.09	r_p=0.47*	r_p=0.52*

*p<0.05
r_p=part correlation after allowing for the effect of RCMAS trait anxiety.

Discussion

Methodological issues

Sample characteristics: Trait anxiety

Trait anxiety for all participants has been investigated to assess whether the samples are representative of the normal population. According to mean measures of trait anxiety on the STAIC, participants appear to be representative of the normal population, with mean trait anxiety scores at or slightly below the mean reported in the norms. The STAI mean scores fell well above the population mean. The RCMAS is again different, showing that mean scores for females remain relatively stable at around the 60th percentile, while for males it tends to dip at grade 7 and then increases again in grade 10. This suggests that the RCMAS, STAIC and STAI are not equivalent measures of trait anxiety, as the RCMAS shows relatively stable trait anxiety levels across the whole age range, while the STAI is quite dissimilar to the STAIC. This had already been demonstrated in the previous experiment.

Investigation of these data also shows that STAIC trait anxiety decreases with age, which is contrary to the findings reported in experiment 2, where there was no effect of grade on this measure. In experiment 1 there was also a significant grade effect on STAIC trait anxiety, however in this experiment, it increased to grade 5 and then decreased. The current experiment also showed a decrease in RCMAS anxiety across the grades, while there was no such decrease in experiment 2. In the current experiment there was no gender effect on STAI or STAIC trait anxiety, but females did report higher anxiety on the RCMAS than males. In experiment 1 females reported greater STAIC trait anxiety, but there was no gender difference on STAI. In experiment 2 there were only gender differences on RCMAS. So, this suggests that the sample used in the current experiment is not equivalent to the ones in previous experiments in terms of trait anxiety effects across the grades.

Baseline, neutral and operation state anxiety

Mean measures of state anxiety suggest that for the STAIC and the STAI, participants reported normal to low levels of state anxiety at baseline and after the neutral scenario. The baseline scores were consistent with those reported by

Strauss et al. (1988) for the equivalent age group, and the neutral scores were slightly lower than those reported in this study. There were no gender differences in state anxiety for the baseline measure or in response to the neutral scenario; however females consistently reported higher levels of state anxiety than males in response to the operation scenario, and there was a significant interaction between gender and measurement time in a repeated measures ANOVA. This finding indicates that females were actually more reactive to the anxiety induction procedure than males. Such a finding has not been reported elsewhere.

Baseline state anxiety did not change with increasing age (although p-state anxiety levels increased for females). There was however an interaction between grade and gender for baseline state anxiety, which showed that there was no difference between genders in grade 3, but in grade 5, females report far lower levels of state anxiety, and in grade 7 the situation was reversed. Neutral state anxiety decreased across the grades, indicating that older participants found the neutral scenario less anxiety inducing.

Effect of anxiety induction on state anxiety

Experiment 2 did not measure baseline state anxiety, and therefore it was not possible to state that there definitely was an increase in state anxiety after the presentation of the operation scenario, although it was clear that state anxiety levels were extreme. Experiment 3 has therefore taken a measure of baseline state anxiety, as well as employing a neutral scenario, in order to compare reported state anxiety after the anxiety induction procedure. There was a significant difference between baseline state anxiety and operation state anxiety, and a significant difference between operation state anxiety and neutral state anxiety. These results provide more conclusive support for the use of this style of anxiety induction by showing that participants report greater state anxiety after the anxiety induction procedure, compared with baseline measures, and also that they show lower levels of anxiety when presented with a neutral scenario compared with the anxiety induction scenario. The results also revealed that participants actually reported significantly lower levels of anxiety after the neutral scenario compared with the baseline measure of anxiety. There are a number of possible reasons for this. Firstly participants may have found the neutral scenario relaxing, or secondly their baseline levels of state anxiety may have been elevated when beginning the experiment due to the unfamiliar situation and task, but that after being given the neutral scenario, they became more relaxed and less threatened in the situation.

Hypothesis 1: TCL responses by scenario presentation condition

The TCL was designed primarily as a validity check to ensure that participants could report back as their own the cognitive content that they had been presented in the scenarios. It was therefore hypothesised that there would be significantly higher levels of reported cognitions in the scale corresponding to the presentation condition of participants. Since experiment 2 provided some evidence that trait anxiety was related to the various cognitions, the data were analysed using ANCOVA, with RCMAS trait anxiety as a covariate. Results revealed that RCMAS was a significant covariate for all but positive statements. Only the positive statements scale and the internal threat statements scale gave clear support for this hypothesis. This indicates that the threat and coping scales are not independent of one another, that participants who experienced anxiety were likely to report not only the cognitive content of their scenario, but cognitive content which reflects their level of anxiety. This is further demonstrated by the significant correlations between the scales to be discussed later.

Hypothesis 2: Correlations between TCL scales and trait anxiety measures

The coping statements and threat statements scales of the TCL have been found to correlate as hypothesised with measures of anxiety. The internal threat statements, external threat statements and coping statements scales of the TCL each correlated positively with measures of trait anxiety, supporting the work of others in this area (Fox et al., 1983; Houston et al., 1984; Prins, 1986; Zatz & Chassin, 1983, 1985), and providing evidence of the convergent construct validity of the scale. It is also noted that the positive statements scale was not correlated with measures of trait anxiety, which supports the findings of Fox et al.(1983) and Prins et al. (1981) both of whom suggest that positive statements are not related to trait anxiety, and gives support to the divergent validity of the positive statements scale.

Hypothesis 3: Intercorrelations between TCL scales

Intercorrelations between the scales of the TCL were calculated to assess the relationships between the scales, and partial correlations taking into account RCMAS trait anxiety were also calculated. Since coping statements and threat statements scales are all positively related to trait anxiety, it was hypothesised that there would be positive correlations amongst these measures. This hypothesis was supported, and the partial correlations remained equivalent for these scales, indicating that their relationship is independent of trait anxiety. There were moderate significant positive correlations between coping statements and the two threat scales, and strong correlations between the two threat statements scales, all of which remained equivalent after trait anxiety had been taken into account.

There were also moderate negative correlations between the positive statements scale and the internal threat statements and external threat statements scales, but there was also a moderate positive correlation between the coping statements scale and the positive statements scale. This opposed the hypothesis which stated that there would be no relationship between the positive statements scale and the other scales of the TCL. This finding demonstrates that positive statements and anxiety-related statements (i.e., threat and coping statements) are not completely unrelated, and their relationship remains after trait anxiety is partialled out. The finding also suggests that the role of coping statements is not entirely clear cut. In experiment 2, the expected positive correlations were found between coping statements and measures of trait anxiety; however coping statements were found to correlate *negatively* with p-state anxiety in the friends scenario, and negatively with STAI state anxiety in the operation scenario, so it may be that coping statements have some role to play in reducing state anxiety.

In summary, results have shown that the four scales of the operation TCL demonstrate convergent construct validity, through their correlations with measures of anxiety, and they also display some internal consistency via the intercorrelations between the scales, and that this internal consistency is independent of their relationship with trait anxiety. While they were originally designed to show that participants could report back accurately the cognitive content of the scenarios, this has not been adequately demonstrated, probably due to the intercorrelations between the scales. Despite this, evidence suggests that the different presentation conditions of the scenarios do induce different levels of anxiety, thus the cognitions which are inserted into them have had the expected effect.

Theoretical issues

Hypotheses 1, 2 and 3: Operation state anxiety by grade, gender and presentation condition

It was hypothesised that there would be no effect of grade on the level of state anxiety induced by the operation scenario. Data were analysed with ANCOVA, using trait anxiety as a covariate for both the STAIC and STAI scales. The results show that while trait anxiety was a significant covariate for STAIC there was an effect of grade on the reports of state anxiety. Analysis revealed that state anxiety in response to the operation scenario was higher in grade 5 participants than grade 3 or grade 7 participants, thus an inverted 'U' developmental pattern has been found. Such a finding has not been reported elsewhere in the anxiety literature.

Investigation of male and female data separately suggested that the grade 5 peak in state anxiety was found mainly in males, and that females showed a fairly steady decrease in state anxiety across the grades. These findings for males and females are also at odds with the findings of the previous experiment, which revealed no changes in state anxiety in response to the operation scenario across the grades for males or females.

There was no effect of grade on state anxiety in response to the neutral scenario. For the baseline measure, there was a significant interaction of grade by gender, which revealed that state anxiety in grade 3 participants was similar for males and females, but in grade 5 males showed significantly higher state anxiety than females, and in grade 7 the females showed significantly higher state anxiety than the males. It is therefore possible that the changes in state anxiety in response to the operation scenario across the grades may be a consequence of the different levels of trait anxiety in this sample compared with the samples used in other experiments.

It was also hypothesised that females would report significantly higher levels of state anxiety in response to the operation scenario. Results supported this hypothesis, with females reporting significantly higher state anxiety on the STAI and STAIC, even when the significant covariate of trait anxiety was taken into account. These results support the findings of experiment 1, where females responded to the initial FSSC-II fear items with significantly higher levels of fear. They also support the findings of experiment 2 where females reported significantly higher levels of state anxiety in response to the operation and friends scenario. Finally they support previous findings which point to higher levels of anxiety disorders, anxiety-related cognitions and fear in females (for example, Kashani et al., 1989, regarding anxiety disorders; Brown et al., 1986; Prins et al., 1994; Zatz & Chassin, 1985, regarding cognitive aspects of anxiety, and Ferrari, 1986; Gullone & King, 1992b; Ollendick & King, 1991, regarding fear). It could be argued that males are more likely to under-report anxiety symptoms, and that the checklist nature of the STAIC and the STAI is open to under-reporting of symptoms. It was also found however that there was no difference in anxiety levels between males and females at baseline (although the interaction of grade by gender for the STAIC suggests that this is not the case across all the grades) or after the neutral scenario, so under-reporting of state anxiety by males is unlikely. ANCOVA on the change between baseline and induced STAIC, p-state anxiety and n-state anxiety demonstrated that females were more reactive to the operation scenario, as there was a significant main effect of gender on the change variable. No effect of gender was found for the change variable for STAI state anxiety, suggesting that females become less reactive as they reach this age.

There was a significant effect of presentation condition on state anxiety, despite trait anxiety being a significant covariate, with participants in the positive presentation condition reporting significantly reduced levels of state anxiety compared with participants in the other three presentation conditions. These results provide support for earlier studies which have shown that coping statements, internal threat statements and external threat statements have a positive relationship to anxiety (Fox et al., 1983; Houston et al., 1984; Prins, 1986;

Zatz & Chassin, 1983, 1985), and that positive statements have a negative relationship to anxiety (e.g. Blankstein et al., 1992; Galassi et al., 1981; Zatz & Chassin, 1983, 1985). Further, the results suggest that the anxiety levels of children can be manipulated by the introduction of positive statements into a threatening imagery scenario. The state anxiety responses to the operation will be considered in greater detail later.

The effect of presentation condition on state anxiety could not be accounted for by group differences prior to presentation of the scenarios, as there was no effect of presentation condition on baseline state anxiety or trait anxiety. While the positive statements did not entirely protect against state anxiety, mean STAIC results show that those given the positive statements presentation condition reported 6.7 points less anxiety than those given the external threat presentation condition, 7.5 points less than those given the coping presentation condition and 8.8 points less than those given the internal threat presentation condition. Given that the STAIC has a possible range of 40 points, when converted to percentages, those given the positive statements presentation condition reported 17%, 19% and 22% less anxiety than those given the coping, internal threat and external threat presentation conditions respectively. The positive statements condition also induced less p-state and n-state anxiety than the other conditions. Investigation of male and female data separately suggests that females were more likely to show the ameliorating effect of the positive scenario condition than males.

There was no effect of presentation condition on the older participants who completed the STAI, and there were no interactions between gender and presentation condition. This may be due to the smaller sample in this older age group, but it may also suggest that older participants are less affected by the different presentation conditions than the younger participants. Trait anxiety was a significant covariate in this analysis. Grade 10 participants will be discussed in further detail when the TCL data are discussed, as these data cover the full age range.

Hypotheses 4, and 5: TCL scales by grade and gender

The TCL was initially included in this experiment as a validity check on the use of different presentation conditions. It can also be used as a measure of cognitive activity in response to anxiety-inducing stimuli. There has been some suggestion that thoughts checklists measure the affective rather than cognitive responses of individuals (Glass & Arnkoff, 1982) and that they measure global distress rather than internal dialogue (Kendall & Chansky, 1991). Despite these criticisms, it is argued that thoughts checklists are the most reliable and valid measures of internal thought (Clark, 1988). Given that the current experiment provides no means of assessing whether the TCL is a valid measure of internal thought as opposed to a measure of the affective dimensions of anxiety (and given the nature of internal thought, it would be virtually impossible to establish this for any measure), the results have been interpreted on the basis that the TCL does measure internal thoughts during exposure to an anxiety-inducing scenario. In addition these data are analysed with ANCOVA, using trait anxiety as a covariate, which controls for the role of trait anxiety in the TCL scores.

Based on the findings of the previous study, it was hypothesised that there would be no effect of grade on the number of reported cognitions reported on the TCL. Trait anxiety was not found to be a significant covariate for TCL positive statements, and analysis revealed that there was no effect of grade on this scale of the TCL. RCMAS anxiety was a significant covariate for the coping statements scale of the TCL, as would be expected given the positive correlation between these two measures. There was no effect of grade on responses to the coping statements scale of the TCL. Again RCMAS anxiety was a significant covariate for the external threat scale of the TCL, however there was no main effect of grade on this scale. Finally, RCMAS anxiety was found to be a significant covariate for TCL internal threat cognitions. There was no effect of grade on this scale of the TCL. It appears that again there were no effects of grade on any of the scales of the TCL when trait anxiety was taken into consideration.

It was hypothesised that females would report significantly more threat and coping statements and significantly less positive statements. Since there are gender differences in reported trait anxiety, analyses controlled for trait anxiety levels. ANCOVA results indicated that trait anxiety was a significant covariate for all TCL scales but the positive statements scale. Gender differences were not evident in the positive statements or the external threat statements scale of the TCL. Females, however, reported significantly more coping statements and internal threat statements. These data suggest that females are more reactive to the coping and internal threat anxiety induction procedures, which is consistent with the greater reactivity noted in the state anxiety scores of female to the anxiety-inducing scenarios.

Hypothesis 6: Correlations between reported cognitions and state anxiety

As previously discussed, the coping statements scale, internal threat statements scale and external threat statements scale of the TCL each correlated positively with the trait scales of the STAIC and the STAI, and the RCMAS. The positive statements scale of the TCL is not correlated with these measures of trait anxiety. The scales were then correlated with the state scales, and partial correlations were also completed to assess the relationship with state anxiety independent of trait anxiety. Results indicated that the coping statements and threat statements scales are positively related to the STAIC and STAI state anxiety measures (supporting the original hypothesis regarding coping and threat statements), and that these correlations remain largely unchanged when partial correlations are calculated which control for trait anxiety. The positive statements scale of the TCL is negatively correlated to state anxiety (both full and partial correlations indicate this). This suggests that while positive statements are unrelated to trait anxiety, they are related to state anxiety. Watson and Clark (1984) argued that the state scale of the STAI consists of items which reflect negative affectivity (such as jittery, nervous, relaxed and calm), and items which reflect a more general happiness/unhappiness dimension (such as pleasant and upset). The factor analysis of STAIC items presented in Chapter 7 did not support this conceptualisation of the scale, but revealed that the items fell clearly into two factors which simply represent the positive and negative items of the scale. This was consistent with the findings of previous factor analytic studies of the STAIC

(Cross & Huberty, 1993; Dorr, 1981; Papay & Hedl, 1978). Given that there are no positive items in the trait scale of the STAIC, it would be tempting to assume that the positive items of the STAIC state scale explain the correlation between the TCL positive statements scale and STAIC state anxiety; however the positive statements scale of the TCL correlates negatively with both p-state anxiety and n-state anxiety, (and these correlations remain relatively unchanged when partial correlations are calculated which control for trait anxiety), suggesting that the two have similar relations to the positive statements scale.

Conclusions

This experiment has investigated the role of cognition in anxiety in children. Children were asked to imagine themselves having an operation and were presented with one of four different patterns of cognition. Three major methodological hypotheses were posed. The findings of this experiment generally supported these hypotheses by demonstrating the following:

1. Participants in the positive statements and internal threat statements conditions reported significantly more TCL positive statements and internal threat statements respectively, than those in the other conditions.
2. The internal threat statements, external threat statements and coping statements scales of the TCL were all significantly positively correlated with trait anxiety, thus supporting the stated hypothesis. The positive scale of the TCL was not correlated with measures of trait anxiety, which again supported the stated hypothesis.

3. The internal threat statements, external threat statements and coping statements scales of the TCL were all significantly positively correlated with one another, even when partial correlations were calculated controlling for trait anxiety, thus supporting the stated hypothesis. The positive statements scale of the TCL was significantly negatively correlated with the two threat scales and significantly positively correlated with the coping statements scale of the TCL, which opposed the stated hypothesis.

Six theoretical hypotheses were posed. There was mixed support for these hypotheses, summarised by the following:

1. It was hypothesised that there would be no effect of grade on reported state anxiety. Results showed that there was an effect of grade on state anxiety, and that this represented an inverted 'U' developmental pattern of state anxiety, with participants in grade 5 reporting higher levels of state anxiety than those in other grades.
2. It was also hypothesised female participants would report higher levels of state anxiety in response to the scenarios. This hypothesis was supported. Further, these gender differences appear to reflect a greater reactivity to anxiety-inducing stimuli in females, as there are no baseline or neutral differences in state anxiety between males and females.
3. It was hypothesised that participants presented with the positive statements condition would report lower levels of state anxiety than those in the coping or threat statements conditions. This hypothesis was supported.

4. It was hypothesised that there would be no effect of grade on the number of reported cognitions in response to the scenarios. This was supported.
5. It was hypothesised that females would report more threat statements and coping statements and less positive statements on the TCL. While females did report significantly more internal threat statements, and coping statements, there were no gender differences on the positive statements and external threat statements scales of the TCL.
6. Finally it was hypothesised that there would be significant positive correlations between state anxiety and TCL coping statements, internal threat statements and external threat statements, and this hypothesis was supported. There was no directional hypothesis posed regarding the relationship between positive statements and state anxiety, however it was found that the positive statements scale of the TCL was negatively related to state anxiety.

These findings represent some significant advances in the study of anxiety and cognition in children. In order to establish that the findings are robust, the fourth and final experiment in the thesis will attempt to replicate them. This fourth experiment will also attempt to generalise the findings of experiment 3 to the other situations previously used in experiment 2, namely the shark and friends scenario.

Chapter 9: Experiment 4- Causal Effects of Positive, Coping and Threat Statements: A Replication of Experiment 3

Experiment 3 investigated the impact that different patterns of cognitions have upon state anxiety and reported cognitions by employing the operation scenario from experiment 3 to induce anxiety in children using four different patterns of cognitions. The findings of that experiment established that the level of induced state anxiety could be influenced by the type of cognitive framework in which the anxiety-inducing material is presented by showing that participants given material in conjunction with positive statements report less state anxiety than those given this same material with coping or threat statements. Further, the findings demonstrated that female participants reported higher levels of induced state anxiety and more anxiety-related cognitions than their male counterparts. The findings demonstrated that state anxiety peaks in grade 5, and that males were more likely to show this peak in anxiety in grade 5 than females. Investigation of reported cognitions on the TCL suggested that the inverse was true of the positive statements checklist, with grade 5 participants reporting less positive statements than other grades. Females reported significantly more coping statements and internal threat statements on the TCL, and less positive statements than their male counterparts. Experiment 3 also established that while threat and coping cognitions are positively related to both trait and state anxiety, positive statements are not related to trait anxiety but show a negative relationship to state anxiety.

The findings of experiment 3 are not consistent with previous findings, which have suggested that there is an increase in some anxiety-related cognitions across the age range (Brown et al., 1986; Vasey, 1994). There have been no reports of an inverted 'U' developmental pattern in either state anxiety or reported cognitions. Investigation of trait anxiety in the sample used in experiment 3 revealed that trait anxiety decreased across the grades. The sample employed was therefore not equivalent with the sample employed in experiment 2, where there was no such effect of grade on trait anxiety. Experiment 4 therefore aims to replicate the findings of experiment 3 using a different sample, to establish whether these findings are robust. In addition to replicating the findings of experiment 3, experiment 4 will establish whether similar effects occur when the other two scenarios from experiment 2 are employed, thus providing evidence that the effects found in experiment 3 can be generalised to other situations.

The methodological hypotheses of this experiment are:

1. Participants will report significantly more cognitions on the TCL scale corresponding to the scenario condition with which they were presented than cognitions on the other three scales in all three scenarios.
2. In all three scenarios, the threat statements and coping statements scales of the TCL will be significantly positively correlated with measures of trait

anxiety, and the positive statements scales of the TCL will not be correlated with trait anxiety.

3. The coping statements and threat statements scales of the TCL will be significantly positively correlated with each other, and significantly negatively correlated with the positive statements scale in all three scenarios.

The theoretical hypotheses of this experiment are as follows:

1. That there will be a significant effect of grade on the level of state anxiety induced by the three scenarios, and that there will be a significant increase in state anxiety from grade 3 to grade 5, followed by a decrease to grade 7.
2. That female participants will report significantly higher levels of state anxiety in response to all three scenarios, and that there will be significant effect of gender on the amount of change from baseline to induced state anxiety.
3. Participants in the positive statements condition will report significantly lower levels of state anxiety than those in the coping or threat statements conditions in all three scenarios.
4. That there will be no effect of grade on the coping statements, threat statements and positive statements scales of the TCL in any of the three scenarios
5. Females will report more threat and coping statements and less positive statements on the TCL in all three scenarios.

6. There will be significant positive correlations between state anxiety and the coping statements and threat statements scales of the TCL, and significant negative correlations between the positive statements scale of the TCL and state anxiety in all scenarios.

Method

Participants

Two hundred and forty two students from three primary schools and one high school participated in this experiment on a voluntary basis with parent consent. Table 4.1 shows a breakdown of these participants by grade and gender. Average age for grade 3 participants was 8 years and 8 months (standard deviation 4.9 months), for grade 5 participants 10 years and 7 months (standard deviation 5.1 months), for grade 7 participants 12 years and 3 months (standard deviation 5.2 months) and for grade 10 participants 15 years and 4 months (standard deviation 5.0 months).

Table 4.1: Participants by grade and gender.

	Gender		
	Females	**Males**	**Total**
Grade			
3	30	28	58
5	35	29	64
7	34	25	59
10	27	34	61
Total	**126**	**116**	**242**

Design

The experiment employed a 4 x 2 x 3 x 3 (grade by gender by presentation condition by scenario) factorial design. As for the previous experiments, participants were selected from grades 3, 5, 7, and 10. The scenarios were presented in one of three conditions: with positive statements, with coping statements or with threat statements. In this experiment, the internal and external threat statements have been collapsed to create one threat condition, consisting of equal numbers of internal and external threat statements. The scenarios were based on the same three employed in experiment 2 outlined in Chapter 7: 'having an operation', 'having no friends' and 'sharks' (see Appendix B4). All participants completed the three experimental scenarios, plus the neutral scenario (the same as that used in experiment 3), unless time constraints did not allow them to complete the neutral scenario, or non-attendance at school did not allow them to complete all the three scenarios. All scenarios were presented in counterbalanced order (see Appendix B4).

Measures

As with the previous two experiments this experiment employed the STAIC (Spielberger, 1973) to measure both state and trait anxiety in students from grades 3, 5 and 7 and the STAI (Spielberger, 1983) was used for the students in grade 10. The RCMAS (Reynolds & Richmond, 1985) was employed as an additional instrument to measure anxiety in all age groups.

Cognition was measured using a separate form of the Thoughts Checklist (TCL) for each scenario (See Appendices A7, A8 and A9). Each TCL consisted of the 30 items used in the three presentation conditions of each of the scenarios, so there were 10 positive statements, 10 coping statements and 10 threat statements. Participants responded either yes or no in response to each item, and received a score ranging from 0 to 10 for each of the three scales. Note that these separate forms of the TCL are referred to by their scenario, so there is the operation TCL, the shark TCL and the friends TCL.

Stimulus selection and development

This experiment aimed to replicate the findings of the previous experiment which employed only the operation scenario and attempted to generalise these findings to other situations, namely 'having no friends' and 'sharks'. The operation scenarios were therefore the same as those used in the previous experiment for positive statements and coping statements. Because participants responded similarly to the internal and external threat scenarios, these two conditions were combined to create a single threat scenario, which included an equal number of internal and external threat cues. Each scenario had the anxiety cues removed, and replaced by either positive statements, coping statements or threat statements, each of which was taken from experiment 2. Scenarios were then developed for the friends and the shark scenarios along the same lines as explained in the previous chapter for experiment 3. The notable exception was that there were very few reported positive statements in response to the shark scenario in experiment 2. Items were therefore created for this scenario using the few existing positive items and the criteria outlined in experiment 2 as guidelines. The same neutral scenario was employed as in experiment 3.

Procedure

The procedure was essentially the same as experiment 3. Due to the inclusion of two more scenarios, the experiment was conducted over two separate sessions on different days about one week apart. This helped to guard against fatigue, and was also more acceptable to the schools. Participants completed the anxiety inventories in the first session, plus one of the four scenarios (i.e., neutral, operation, friends or shark), and completed the remaining conditions in the second session.

Results

As for the previous experiment, the results section of this chapter is divided into a methodological and a theoretical section. The methodological section initially provides descriptive information regarding the sample employed in the experiment in terms of trait anxiety and state anxiety. The methodological hypotheses are then explored. The theoretical hypotheses of the experiment are then addressed. As for the previous experiment, all analyses assessing state anxiety and cognitions have taken trait anxiety into account, either through calculating partial correlations, hierarchical regression analyses or analysis of covariance.

Because the two subsidiary scales of the STAIC state scale did not add to the interpretation of data in the previous experiment, they have been omitted from the results section of this chapter except where particularly relevant. STAIC state anxiety subscales means and standard deviations for baseline, the operation, friends, shark and neutral scenarios are presented in Appendices C12 and C13, and further analyses for these data are presented in Appendices C14 and C15.

Methodological issues

Sample description

Mean trait anxiety scores and their corresponding T scores for males and females across all grades are presented in Table 4.2 below. As for the previous experiments, the T scores of the STAIC were based on the total sample of grades 3, 4 and 5 students for males and females separately and the T scores for the STAI were based on a high school sample for males and females separately. T score results suggest that grade 10 participants reported higher levels of trait anxiety on the STAI than the younger participants completing the STAIC, which is consistent with the findings in experiment 3. Analysis of raw data showed that 8.1% of males and 13.1% of females had STAIC trait anxiety scores which were more than one standard deviation above the expected mean, while for STAI trait anxiety 14.7% of males and 18.5% of females were within this upper range.

A two way ANOVA of grade by gender on the STAIC trait measure revealed that there was no significant effect of grade [$F(2, 179)=0.54$, ns] or gender [$F(1, 179)=0.07$, ns], and there was no significant interaction between grade and gender

[F(3, 179)=0.04, ns]. An independent samples t test revealed that there was no significant effect of gender on STAI trait anxiety [t(1, 59)=1.37, ns].

Table 4.2 also gives mean scores and the corresponding T scores for the RCMAS. As in the previous experiments, T scores are based on white populations of students in separate age groups and genders. T scores on the RCMAS for males and females show that, in relative terms, anxiety increased across the grades, but for females this stays within the average range of scores. Mean RCMAS scores for males in grades 7 and 10 were at least one standard deviation above the mean. Two way ANOVA of grade by gender on the RCMAS showed that there was no significant effect of grade on RCMAS raw scores [F(2, 179)=0.37, ns] or of gender [F(2, 228)=0.96, ns]. There was no significant interaction between grade and gender on RCMAS [F(3, 228)=0.17, ns].

Table 4.2: Means, standard deviations (in parentheses), T scores and numbers for STAI and STAIC trait anxiety and RCMAS score by gender and grade.

STAI and STAIC Trait Anxiety Scores				
Gender	**Grade 3**	**Grade 5**	**Grade 7**	**Grade 10**
Females	34.50 (4.1) T=45 n=30	35.37 (7.6) T=47 n=35	34.64 (7.1) T=47 n=34	44.37 (8.9) T=65 n=27
Males	34.00 (5.9) T=44 n=28	35.49 (8.2) T=45 n=30	34.22 (6.2) T=44 n=25	41.18 (9.2) T=56 n=34
Total	34.26 (5.0)	35.43 (7.9)	34.77 (7.2)	42.59 (9.1)
RCMAS Scores				
Gender	**Grade 3**	**Grade 5**	**Grade 7**	**Grade 10**
Females	11.37 (5.0) T=42 n=30	12.40 (7.4) T=53 n=35	11.21 (6.4) T=60 n=34	11.88 (6.4) T=57 n=27
Males	10.11 (5.5) T=44 n=28	11.43 (6.3) T=59 n=30	11.43 (6.4) T=66 n=25	10.59 (7.2) T=70 n=34
Total	10.76 (5.2)	11.91 (6.8)	11.30 (6.3)	11.21 (6.8)

Note that grade 10 students completed the STAI and the students in grades 3, 5 and 7 completed the STAIC.

Baseline, neutral and induced state anxiety

Table 4.3 includes raw scores and corresponding T scores for STAIC and STAI state anxiety, by gender and grade at baseline, after the operation scenario, after the friends scenario, after the shark scenario and after the neutral scenario. State anxiety responses to the anxiety-inducing scenes will be analysed according to presentation condition later. State anxiety responses at baseline and in response to the four scenarios are presented by presentation condition and grade in Appendix C4, and by gender in Appendix C5.

According to the T scores, mean baseline STAI and STAIC state anxiety scores were well within the average range for state anxiety, apart from grade 10 males whose mean score was well below the expected mean for a normal population.

For the three anxiety-inducing scenarios, females STAIC mean scores were at least two standard deviations above the norm, and the mean scores for males were at least one standard deviation above this mean. Over all, grade 10 females responded at a slightly lower level than the younger females, but their mean score was still greater than one standard deviation above the norm, as was the mean for grade 10 males. In response to the neutral scene, T scores of mean STAIC state anxiety scores suggest that both male and female participants were generally responding within the low average range of state anxiety, while their grade 10 counterparts were responding well below the average range of state anxiety.

Gender differences for state anxiety at baseline and after the neutral scenario were assessed using independent samples t tests. There were no differences between males and females on the STAIC or STAI baseline state anxiety [$t(181)=0.45$, ns and $t(59)=1.58$, ns respectively]. The neutral scenario induced significantly higher state anxiety in females on the STAI, but not the STAIC [$t(34)=2.72$, $p<0.05$ and $t(140)=0.25$, ns respectively]. Gender and grade effects for the experimental scenarios will be considered at a later point.

Table 4.3: Mean STAIC and STAI state anxiety scores, standard deviations (in parentheses) and T scores for all scenarios by gender and grade.

Gender	Grade	Baseline	Operation	Friends	Shark	Neutral
Female	3	27.86 (4.0)	44.86 (10.2)	44.64 (9.6)	49.86 (10.0)	26.13 (5.2)
		T=44	T=70	T=70	T=76	T=40
	5	29.54 (7.0)	46.60 (10.1)	45.31 (9.1)	48.74 (9.9)	27.57 (8.7)
		T=46	T=72	T=70	T=74	T=44
	7	30.59(6.2)	48.09 (8.0)	46.33 (9.9)	52.30 (6.6)	26.57 (4.1)
		T=52	T=73	T=71	T=78	T=42
	10	36.04 (9.8)	59.62 (12.7)	59.15 (13.6)	66.31 (15.0)	25.48 (20.9)
		T=41	T=65	T=64	T=70	T=12
Male	3	28.36 (4.3)	41.00 (1.0)	39.89 (11.0)	41.82 (12.2)	27.58 (6.8)
		T=46	T=65	T=63	T=66	T=46
	5	28.91 (5.5)	42.50 (10.9)	44.10 (9.9)	46.97 (9.3)	25.21 (5.4)
		T=48	T=66	T=68	T=71	T=39
	7	30.09 (6.1)	45.96 (7.0)	44.14 (11.0)	49.33 (7.1)	27.44 (5.6)
		T=51	T=70	T=68	T=72	T=44
	10	31.68 (11.4)	54.56 (16.7)	57.12 (16.1)	60.15 (13.1)	25.86 (5.6)
		T=26	T=66	T=68	T=70	T=10

Note that grade 10 students completed the STAI, which has a maximum score of 80, and the students in grades 3, 5 and 7 completed the STAIC, which has a maximum score of 60.

Effect of anxiety induction on state anxiety

Analysis of raw state anxiety data showed that there were generally less participants reporting state anxiety more than one standard deviation above the mean than would be expected in a normal population for the baseline and neutral measures of state anxiety. In response to the three anxiety-inducing scenarios, there were more participants whose state anxiety scores were more than one standard deviation above the mean than would be expected in a normal population. Table 4.4 illustrates the percentage of scores within this range for males and females across all measures of state anxiety.

Table 4.4: Percentage of state anxiety scores more than one standard deviation above the mean.

Gender	Scale	Baseline	Operation	Friends	Shark	Neutral
Female	STAIC	9.3%	81.7%	76.7%	90.6%	5.5%
	STAI	7.4%	65.4%	66.7%	88.5%	6.7%
Male	STAIC	14.0%	72.8%	72.7%	78.2%	8.7%
	STAI	2.9%	65.6%	69.7%	81.8%	0%

Note, mean is based on the norms given in the manuals for the STAI and STAIC.

Paired t-tests were completed between measures of baseline state anxiety and the anxiety-inducing scenarios state anxiety. STAIC state anxiety scores were significantly higher for each of the anxiety-inducing scenarios than baseline [$t(166)= 16.84$, $p<0.05$ for the friends scenario; $t(171)=18.82$ $p<0.05$ for the operation scenario and $t(171)=22.45$ $p<0.05$ for the shark scenario]. STAI state anxiety scores were significantly higher for each of the anxiety-inducing scenarios than for the baseline measure [$t(59)=11.15$, $p<0.05$ for the friends scenario; $t(57)=10.31$ $p<0.05$ for the operation scenario and $t(58)=14.28$, $p<0.05$ for the shark scenario]. STAIC state anxiety in response to each of the anxiety-inducing scenarios was significantly higher than STAIC neutral state anxiety responses [$t(128)= 19.35$, $p<0.05$ for the friends scenario; $t(130)=17.98$ $p<0.05$ for the operation scenario and $t(133)=21.65$ $p<0.05$ for the shark scenario]. STAI state anxiety responses were significantly higher in response to the anxiety inducing scenarios than the neutral scenario measures [$t(33)=12.89$, $p<0.05$ for the friends scenario; $t(33)=9.40$ $p<0.05$ for the operation scenario and $t(33)=12.89$ $p<0.05$ for the shark scenario].

TCL responses by scenario presentation condition

ANCOVAs were conducted on all three scales of the operation, friends and shark forms of the TCL by presentation condition with RCMAS anxiety as a covariate. Table 4.5 shows mean scale scores on the each form of the TCL.

Table 4.5: Mean TCL scale scores and standard deviations (in parentheses) for each presentation condition and F scores for the RCMAS as a covariate and main effect of presentation condition.

	Scenario Presentation Condition				
	Positive	**Coping**	**Threat**	**F Score RCMAS**	**F Score Presentation**
TCL Scale					
Operation					
Positive	5.47(3.1)	4.59(2.7)	4.39(2.9)	F(1, 214)=0.61	F(2, 214)=3.70*
Coping	5.46(2.4)	5.35(2.8)	5.81(2.0)	F(1, 214)=12.87*	F(2, 214)=0.87
Threat	5.16(3.3)	5.81(2.8)	6.51(2.9)	F(1, 214)=20.03*	F(2, 214)=5.86*
Friends					
Positive	5.17(2.7)	3.84(2.7)	3.37(2.9)	F(1, 213)=4.00*	F(2, 213)=9.29*
Coping	5.96(2.7)	7.00(2.1)	5.77(2.5)	F(1, 213)=0.03	F(2, 213)=5.28*
Threat	5.22(3.3)	5.89(2.6)	6.61(3.3)	F(1, 213)=17.03*	F(2, 213)=3.51*
Shark					
Positive	3.43(3.2)	2.85(2.5)	2.66(2.5)	F(1, 206)=3.30	F(2, 206)=1.34
Coping	7.41(2.4)	7.88(2.0)	7.71(1.7)	F(1, 206)=3.23	F(2, 206)=0.77
Threat	7.00(2.5)	7.25(2.5)	7.64(2.7)	F(1, 206)=9.79*	F(2, 206)=1.02

*p<0.05

Correlations between TCL scales and trait anxiety measures

Table 4.6 shows correlations between each scale of the operation, friends and shark forms of the TCL and measures of trait anxiety. This table shows that there are significant negative correlations between the positive statements scales of the shark and friends TCL and trait anxiety, but not between the positive statements scale of the operations TCL and trait anxiety, and that the threat statements scale of all three TCL forms correlate with the STAIC and RCMAS, but not with the

STAI. The operation TCL coping statements are significantly positively correlated with the RCMAS and the shark TCL coping statements scales are significantly positively correlated with STAIC trait anxiety.

Table 4.6: Trait anxiety measures correlated with the positive statements, coping statements and threat statements scales of the three forms of the TCL.

	Thoughts Checklist Scales		
	Positive	**Coping**	**Threat**
Anxiety Measures			
Operation			
STAIC n=168	r=-0.04	r=0.13	r=0.27*
STAI n=57	r=0.00	r=0.08	r =0.09
RCMAS n=218	r=-0.03	r=0.24*	r=0.27*
Friends			
STAIC n=167	r=-0.24*	r=0.04	r=0.34*
STAI n=59	r=-0.02	r=-0.02	r=0.15
RCMAS n=217	r=-0.11	r=-0.02	r=0.26*
Shark			
STAIC n=161	r=-0.19*	r=0.16*	r=0.25*
STAI n=58	r=-0.01	r=-0.03	r=0.10
RCMAS n=210	r=-0.11	r=0.11	r=0.21*

*=p<0.05

Intercorrelations between TCL scales

Table 4.7 shows intercorrelations between the three scales for each form of the TCL. The positive statements scale correlates negatively with the threat statements scale, on all forms of the TCL, and negatively with the coping statements scale on the shark form of the TCL. The coping statements scale correlated positively with the threat statements scales on all forms of the TCL. Partial correlations have also been calculated which control for trait anxiety as measured by RCMAS, and these partial correlations are essentially the same as the initial correlations, indicating that trait anxiety is not a significant contributor to the relationship between the three scales.

Table 4.7: Correlations (r) and partial correlations (r_p, controlling for RCMAS trait anxiety) between the three TCL scales

	TCL Scales		
	Positive	**Coping**	**Threat**
TCL Scales			
Operation (n=225)			
Positive	**r=1.00**	r=-0.01	r=-0.45*
Coping	r_p=0.01	**r=1.00**	r=0.52*
Threat	r_p=-0.47*	r_p=0.48*	**r=1.00**
Friends (n=226)			
Positive	**r=1.00**	r=0.02	r=-0.51*
Coping	r_p=0.03	**r=1.00**	r=0.39*
Threat	r_p=-0.52*	r_p=0.41*	**r=1.00**
Shark (n=219)			
Positive	**r=1.00**	r=-0.17*	r=-0.48*
Coping	r_p=-0.14*	**r=1.00**	r=0.51*
Threat	r_p=-0.47*	r_p=0.51*	**r=1.00**

*=p<0.05
Note that r= Pearson's correlations and r_p = partial correlations controlling for the effects of trait anxiety as measured by RCMAS

Theoretical issues

As the data in this section are extensive, mean scores for state anxiety by presentation condition and grade have been included in Appendix C4, and by gender in Appendix C5. Mean TCL scores by presentation condition and grade and by gender are included in Appendices C6 to C11 for each of the three forms of the TCL. Within this section results are presented by ANCOVA analyses controlling for STAI and STAIC trait anxiety, with the interactions illustrated in figures.

State anxiety by grade, gender, presentation condition and scenario

As a preliminary analysis STAIC state anxiety data were assessed by a repeated measures ANCOVA for grade by gender by presentation condition by scenario (operation, friends, shark) with STAIC trait anxiety as a covariate. There were significant main effects for all between subjects factors [$F(2, 135)=4.64$, $p<0.05$ for grade; $F(1, 135)=15.71$, $p<0.05$ for gender and $F(2,135)=23.71$, $p<0.05$ for presentation condition] and trait anxiety was a significant covariate [$F(1, 135)=10.23$, p.05]. The within subjects factor of scenario was not significant [$F(2, 270)=2.60$, ns], however there was a significant interaction between presentation condition and scenario [$F(4, 270)=3.08$, $p<0.05$], indicating that the effect of presentation condition varied across the three different scenarios. This suggests that the most effective means of understanding the data is to assess each scenario separately. This also allows comparison between this experiment and the former.

STAI state anxiety responses to the scenarios were also investigated using a repeated measures ANCOVA for gender by presentation condition across all three anxiety-inducing scenarios. Mean scores revealed that there were higher state anxiety responses to the shark scenario than the other scenarios and that there were lower state anxiety responses to the positive statements condition (see Appendix C4 for mean scores). Results showed that trait anxiety was not a significant covariate [$F(2, 98)=0.17$, ns] and there were not main effects of between or within subjects factors [$F(2, 98)=0.53$, ns for scenario, $F(2, 49)=0.24$, ns for presentation condition, $F(1, 98)=1.00$, ns for gender]. The interaction between scenario and presentation condition was not significant [$F(2, 98)=0.49$]. To maintain consistency and to allow comparisons between this and experiment 3, STAI data were also analysed separately for each scenario.

Operation state anxiety by grade, gender and presentation condition

A three way ANCOVA was conducted on the STAIC state anxiety responses to the operation scenario for grade by gender by presentation condition with STAIC trait anxiety as a covariate. Results of this ANCOVA are given in Table 4.8, and mean scores are given in Appendix C4. Mean scores revealed that state anxiety increased across the grades, that females reported more state anxiety than males and that state anxiety was lowest in the positive statements condition. As can be seen from Table 4.8, all of these were significant main effects, despite the trait anxiety being a significant covariate. There was also a significant interaction between grade and presentation condition, and this is illustrated in Figure 4.2 which demonstrates that the ameliorating effect of positive statements on state anxiety is most pronounced in grade 3 participants.

Table 4.8: Analysis of covariance results on STAIC state anxiety responses to the three scenarios for grade, gender and presentation condition with STAIC trait anxiety as the covariate.

	Operation	Friends	Shark
STAIC trait anxiety	$F(1, 155)=9.91^*$	$F(1, 148)=16.67^*$	$F(1, 155)=3.26^*$
Gender	$F(1, 155)=7.68^*$	$F(1, 148)=3.97^*$	$F(1, 155)=10.08^*$
Presentation	$F(2, 155)=31.19^*$	$F(2, 148)=17.41^*$	$F(2, 155)=6.33^*$
Grade	$F(2, 155)=3.68^*$	$F(3, 148)=2.07$	$F(3, 155)=4.36^*$
Grade x Gender	$F(2, 155)=0.28$	$F(2, 148)=0.92$	$F(2, 155)=2.23$
Grade x Presentation	$F(4, 155)=3.30^*$	$F(4, 148)=3.36^*$	$F(4, 155)=2.45^*$
Gender x Presentation	$F(2, 155)=0.11$	$F(2, 148)=0.41$	$F(2, 155)=1.13$
Grade x Gender x Presentation	$F(4, 155)=1.09$	$F(4, 166)=3.40^*$	$F(4, 173)=1.37$

$^*p<0.05$

As there was no significant effect of gender on baseline state anxiety scores, but a significant effect of gender on operation state anxiety scores, a change variable was calculated between baseline and induced state anxiety. A one way ANCOVA assessing the effect of gender on this variable with STAIC trait anxiety as a covariate was conducted. Results indicated that trait anxiety was not a significant covariate [$F(1, 169)=0.00$, ns], but that the main effect of gender was significant [$F(1, 169)=4.51$, $p<0.05$]. This effect is illustrated in Figure 4.1 which demonstrates that the females show a greater increase in state anxiety than males. The same procedure was adopted for STAI state anxiety data. An ANCOVA was conducted on the change variable, with STAI trait anxiety as the covariate. In this instance, trait anxiety was a significant covariate [$F(1, 55)=5.42$, $p<0.05$] and there was no effect of gender [$F(1, 55)=0.09$, ns].

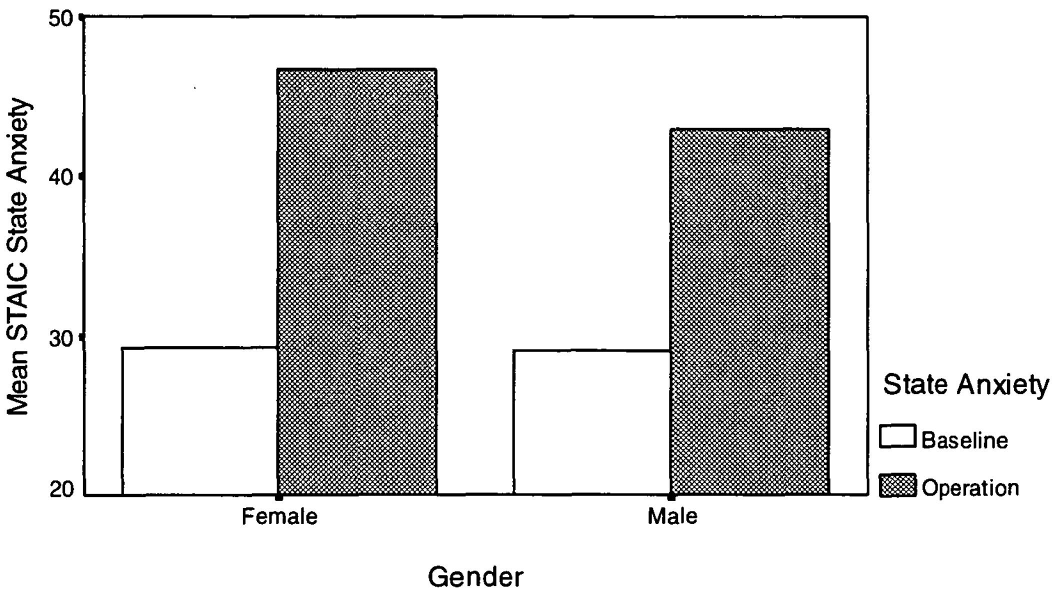

Figure 4.1: Effect of the operation scenario on males' and females' STAIC state anxiety scores.

A two way ANCOVA was then conducted on STAI state anxiety responses to the operation scenario by gender and presentation condition with trait anxiety as a covariate. Mean scores (in Appendix C4 and C5) suggest that state anxiety was higher for females and that there were lower levels of reported state anxiety in the positive statements conditions. ANCOVA results on STAI state anxiety in response to the operation scenario are presented in Table 4.9 and indicate that trait anxiety was not a significant covariate, that there were no significant main effects, and no significant interactions between either of the factors.

Table 4.9: Analysis of covariance results on STAI state anxiety responses to the three scenarios by grade, gender and presentation condition with STAI trait anxiety as the covariate.

	Operation	Friends	Shark
STAI Trait Anxiety	F(1, 51)=0.02	F(1, 53)=0.57	F(1, 52)=0.36
Gender	F(1, 51)=1.93	F(1, 53)=0.20	F(1, 52)=3.86
Presentation	F(2, 51)=0.79	F(2, 53)=1.33	F(2, 52=0.96
Gender x Presentation	F(2, 51)=0.31	F(2, 53)=0.17	F(2, 52)=1.74

*p<0.05

Friends state anxiety by grade, gender and presentation condition

A three way ANCOVA was conducted on STAIC state anxiety in response to the friends scenario for grade by gender by presentation condition. Results of this ANCOVA are given in Table 4.8 with mean scores in Appendix C4. Mean scores show that state anxiety was lowest in the positive statements presentation condition, and highest in the external threat condition and that females reported higher state anxiety levels. These were both significant main effects. This was despite a trait anxiety being a significant covariate. There was a significant interaction between grade and presentation condition, and this interaction is illustrated in Figure 4.3 which demonstrates that the ameliorating effect of positive statements on state anxiety is most pronounced in grade 3 participants.

Since there was no significant effect of gender on baseline data, but a significant effect of gender on friends state anxiety responses, a change variable was calculated between baseline and induced state anxiety. A one way ANCOVA assessing the effect of gender on this variable with STAIC trait anxiety as a covariate was conducted. Results indicated that trait anxiety was not a significant covariate [F(1, 164)=0.54, ns], and that the main effect of gender was not significant [F(1, 164)=2.12, ns]. The same procedure was adopted for STAI state anxiety responses to the friends scenario. An ANCOVA was conducted on the change variable, with STAI trait anxiety as the covariate. In this instance, trait anxiety was a significant covariate [F(1, 57)=4.05, p<0.05] and there was no effect of gender [F(1, 57)=0.02, ns].

Two way ANCOVAs were then conducted on STAI state anxiety in response to the friends scenario by gender and presentation condition with trait anxiety as a covariate. Mean scores (in Appendix C4 and C5) indicate that state anxiety was lower in response to the positive statements condition, and was lower in males. ANCOVA results presented in Table 4.9 indicate that trait anxiety was not a significant covariate, that there were no significant main effects of either gender or presentation condition, and that there were no significant interactions between the factors.

Shark state anxiety by grade, gender and presentation condition

A three way ANCOVA was conducted on STAIC state anxiety in response to the shark scenario for grade by gender by presentation condition. Mean state anxiety responses to the shark scenario show that state anxiety increased as grade increased, that females reported significantly more state anxiety and that state anxiety was greatest in response to the threat presentation condition. These were all significant main effects, despite STAIC trait anxiety being a significant covariate. Results of this ANCOVA are given in Table 4.8, and mean scores are reported in Appendix C4 and C5. There was also a significant interaction between grade and presentation condition, and this is illustrated in Figure 4.4, and demonstrates the ameliorating effect of positive statements on state anxiety is most pronounced in grade 3 participants, and is consistent with the operation and friends scenarios.

As there was no significant effect of gender on baseline data, but a significant effect of gender on STAIC state anxiety responses to the shark scenario, a change variable was calculated between baseline and induced state anxiety. A one way ANCOVA assessing the effect of gender on this variable with STAIC trait anxiety as a covariate was conducted. Results indicated that trait anxiety was not a significant covariate [$F(1, 169)=0.20$, ns], but that the main effect of gender was significant [$F(1, 169)=6.50$, $p<0.05$]. This effect is similar to the effect reported in the operation scenario and illustrated in Figure 4.1, with females showing a greater increase in state anxiety than males. The same procedure was adopted for STAI state anxiety responses to the shark scenario. An ANCOVA was conducted on the change variable, with STAI trait anxiety as the covariate. In this instance, trait anxiety was a significant covariate [$F(1, 56)=10.97$*, $p<0.05$] and there was no effect of gender [$F(1, 56)=1.21$, ns].

Two way ANCOVAs were then conducted on STAI state anxiety in response to the shark scenario by gender and presentation condition. Mean scores (in Appendix C4 and C5) indicate that state anxiety was lower in response to the positive statements condition, and was lower in males. ANCOVA results presented in Table 4.9 indicate that there were no significant main effects or interactions, and that trait anxiety was not a significant covariate.

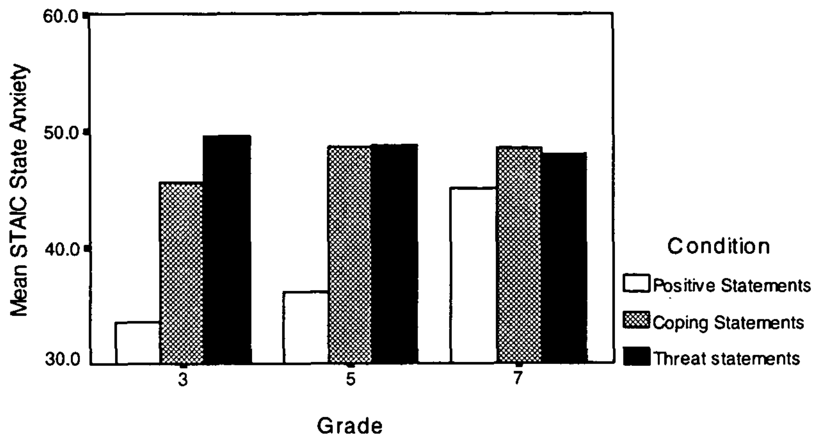

Figure 4.2: STAIC state anxiety in response to the operation scenario for grade by presentation condition.

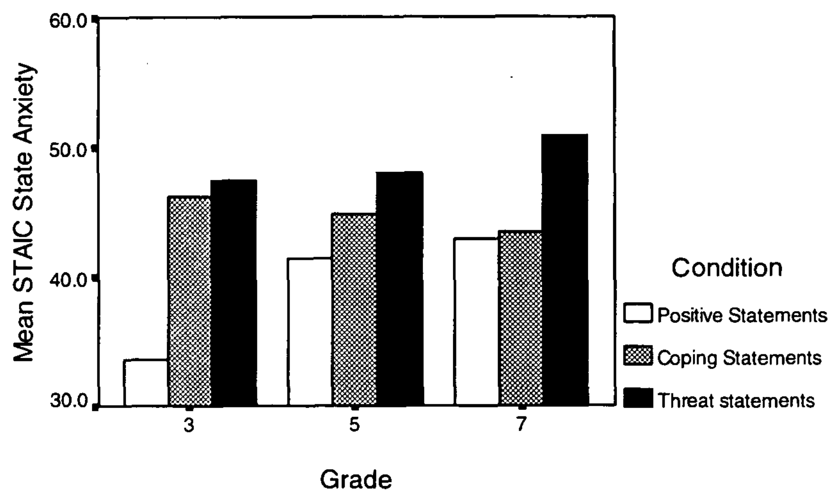

Figure 4.3: STAIC state anxiety in response to the friends scenario for grade by presentation condition.

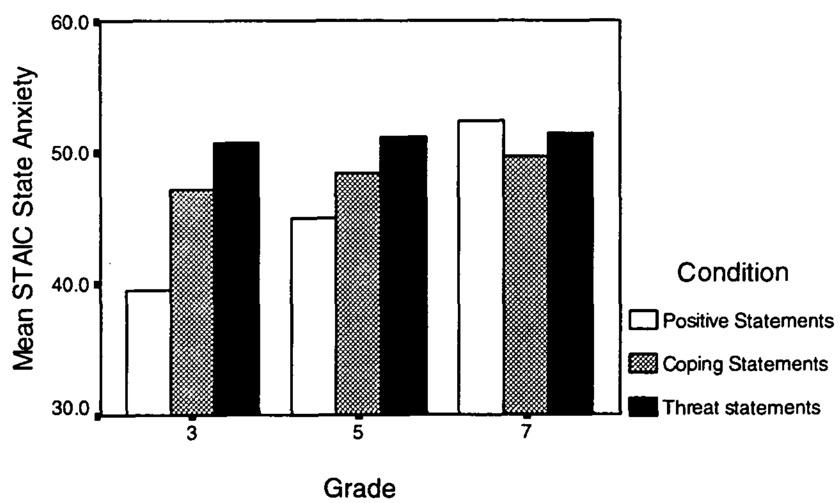

Figure 4.4: STAIC state anxiety in response to the shark scenario for grade by presentation condition.

Operation TCL scales by grade, gender and presentation condition

Separate three way ANCOVAs were conducted on each of the three scales (positive, coping and threat) of the operation TCL for grade by gender by presentation condition with RCMAS anxiety as a covariate. Results of these ANCOVA's are given in Table 4.10 with mean scores reported in Appendix C6 and C7.

Table 4.10: Analysis of covariance results for the operation TCL scales by grade, gender and presentation condition with RCMAS anxiety as a covariate.

	Positive	**Coping**	**Threat**
RCMAS	F(1, 193)=0.14	F(1, 193)=15.02*	F(1, 193)=21.58*
Gender	F(1, 193)=1.74	F(1, 193)=4.29*	F(1, 193)=1.88
Presentation	F(2, 193)=4.29*	F(2, 193)=1.20	F(2, 193)=5.83*
Grade	F(3, 193)=0.91	F(2, 193)=4.00*	F(3, 193)=2.82*
Grade x Gender	F(3, 193)=0.15	F(3, 193)=0.36	F(3, 193)=0.08
Grade x Presentation	F(6, 193)=2.40*	F(6, 193)=2.84*	F(6, 193)=0.41
Gender x Presentation	F(2, 193)=0.15	F(2, 193)=0.13	F(2, 193)=0.16
Grade x Gender x Presentation	F(6, 193)=1.96	F(6, 193)=1.48	F(6, 193)=3.01*

*p<0.05

Mean scores revealed that scores on the operation TCL positive statements scale were highest in grades 3 and 10, that they were higher in males than females and that there were more positive statements in response to the positive scenario than the other conditions. Table 4.10 shows that only the presentation condition main effect was significant. RCMAS was not a significant covariate. There were also significant interactions between grade and presentation condition, and this is illustrated in Figure 4.5.

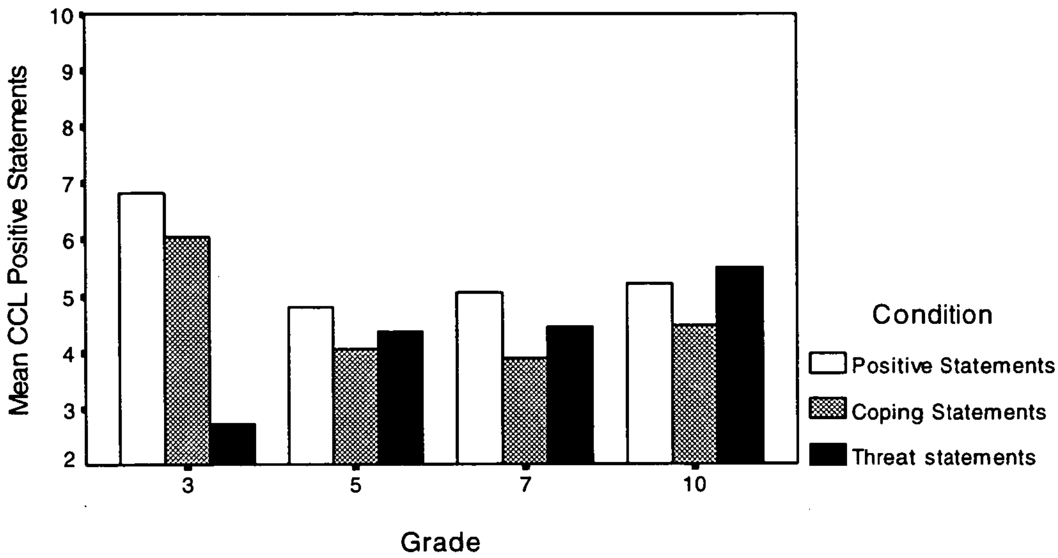

Figure 4.5: Grade by presentation condition for the operation TCL positive statements

Mean scores revealed that responses to the operation TCL coping statements scale were reported at the highest levels in grades 3 and 7, that they were higher in females than males but that there was no notable difference between the number of coping statements reported according to the presentation condition. Table 4.10 shows that the main effects for grade and gender were significant, despite RCMAS being a significant covariate. There was a significant interaction between grade and presentation condition, and this is illustrated in Figure 4.6

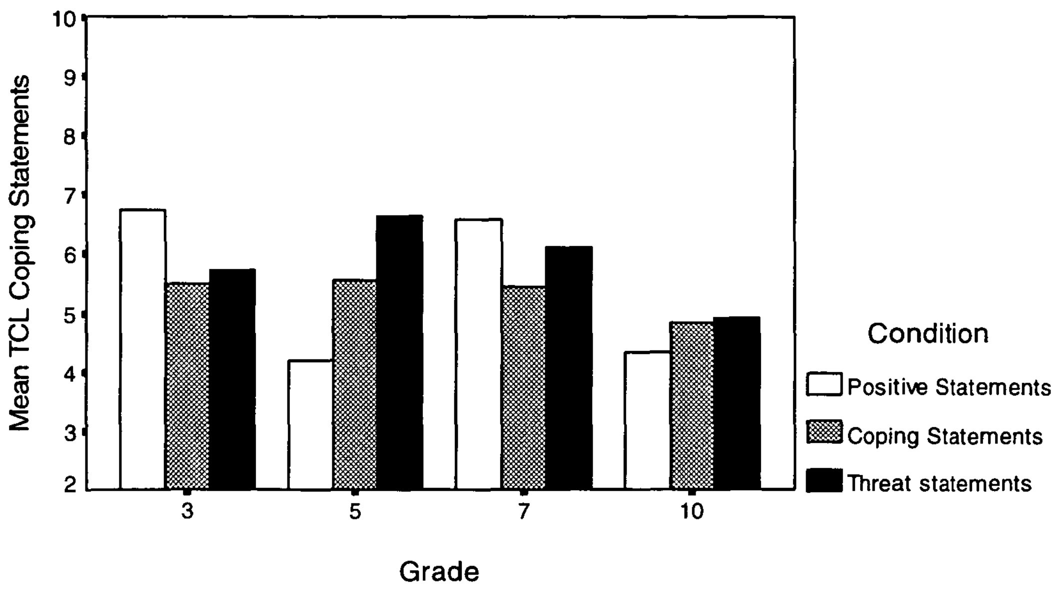

Figure 4.6: Grade by presentation condition for the operation TCL coping statements

Mean scores revealed that responses to the operation TCL threat statements scale were reported at the highest levels in grade 7, that they were higher in females and that there were more of threat statements than coping or positive statements in response to the threat condition. Table 4.10 shows that the main effect for presentation condition and grade were both significant, as was RCMAS as a covariate. There were no significant interactions between any of the variables for threat statements.

Friends TCL scales by grade, gender and presentation condition

Separate three way ANCOVAs were conducted on the three scales of the friends TCL for grade by gender by presentation condition. Results of these ANCOVAs are given in Table 4.11, with mean scores given in Appendix C8 and C9.

Mean scores on the friends TCL positive statements scale decreased as age increased, were higher in response to the positive condition in comparison to the coping and threat conditions and were lower in females. There were significant main effects of gender and presentation condition. None of the two way interactions was significant (see Table 4.11 for details), and the covariate of RCMAS was not significant.

Mean scores on the friends TCL coping statements scale revealed coping statements tend to decrease as grade increases, that females report more coping statements, and that there were more coping statements reported in response to the coping scenario than the others. ANCOVA results in Table 4.11 show that the main effects for grade and presentation condition were both significant. There were no significant two way interactions between variables, however the three way interaction was significant. RCMAS anxiety was not a significant covariate for the friends coping scale.

Mean scores on the friends TCL threat statements scale show that there were no clear grade differences, but that there were more threat statements reported in response to the threat scenario than the other scenarios. Only the presentation condition shows a significant main effect, however RCMAS anxiety was s significant covariate, as can be seen in Table 4.11. There were no significant interactions between variables.

Table 4.11: Analysis of covariance results on the three scales of the friends and shark TCL by grade, gender and presentation condition with RCMAS as the covariate.

Friends	**Positive**	**Coping**	**Threat**
RCMAS	F(1, 192)=1.90	F(1, 192)=0.19	F(1, 192)=16.60*
Gender	F(1, 192)=6.89*	F(1, 192)=3.49	F(1, 192)=2.21
Presentation	F(2, 192)=8.07*	F(2, 192)=5.17*	F(2, 192)=3.48*
Grade	F(3, 192)=2.24	F(2, 192)=2.88*	F(3, 192)=1.82
Grade x Gender	F(3, 192)=0.53	F(3, 192)=0.29	F(3, 192)=0.43
Grade x Presentation	F(6, 192)=0.92	F(6, 192)=0.55	F(6, 192)=1.03
Gender x Presentation	F(2, 192)=0.75	F(2, 192)=1.93	F(2, 192)=0.14
Grade x Gender x Presentation	F(6, 192)=0.77	F(6, 192)=2.27*	F(6, 192)=1.89
Shark	**Positive**	**Coping**	**Threat**
RCMAS	F(1, 185)=1.07	F(1, 195)=5.51*	F(1, 185)=8.33*
Gender	F(1, 185)=7.15*	F(1, 195)=11.87*	F(1, 185)=12.84*
Presentation	F(2, 185)=1.76	F(2, 195)=0.81	F(2, 185)=1.38
Grade	F(3, 185)=5.09*	F(2, 195)=2.00	F(3, 185)=0.33
Grade x Gender	F(3, 185)=0.34	F(3, 195)=1.78	F(3, 185)=0.10
Grade x Presentation	F(6, 185)=0.76	F(6, 195)=3.56*	F(6, 185)=1.92
Gender x Presentation	F(2, 185)=0.66	F(2, 195)=2.34	F(2, 185)=2.48
Grade x Gender x Presentation	F(6, 185)=0.74	F(6,195)=3.23*	F(6, 185)=2.70*

*p<0.05

Shark TCL scales by grade, gender and presentation condition

Mean scores on the shark TCL positive statements scale decreased as age increased, were higher in response to the positive condition in comparison to the coping and threat conditions and were lower in females. There were significant main effects of grade and gender only. There were no significant interactions between any of the factors (see Table 4.11 for details), and RCMAS anxiety was not a significant covariate.

Mean scores on the shark TCL coping statements scale decreased across the grades and were reported at higher levels in females. ANCOVA results in

Table 4.11 show that the only significant main effect was for gender. There was a significant interaction between grade and presentation condition, which is illustrated in Figure 4.7. RCMAS was a significant covariate. There was also a significant three way interaction between all variables.

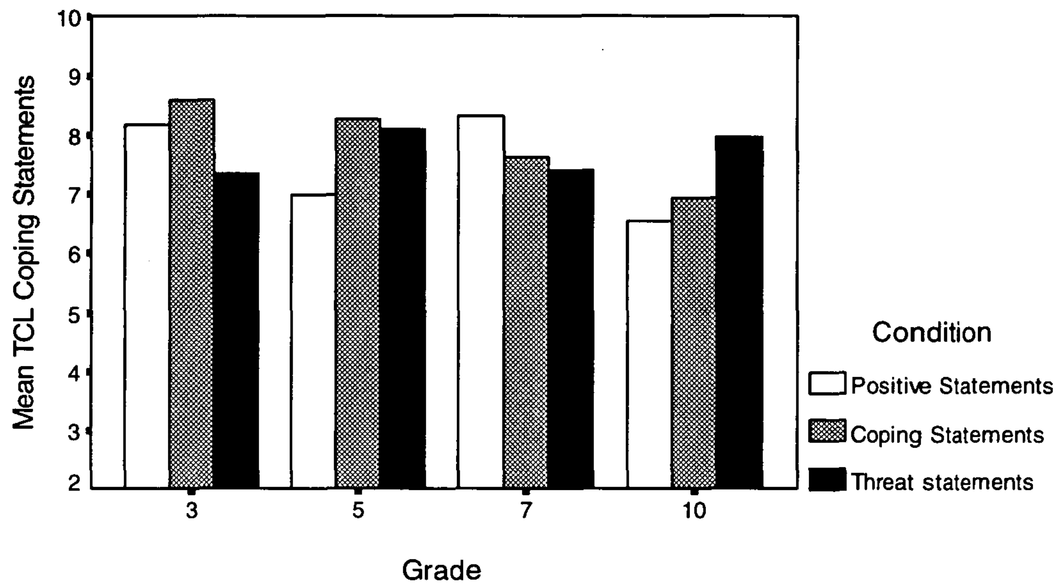

Figure 4.7: Grade by presentation condition for the shark TCL coping statements.

Mean scores on the shark TCL threat statements scale were reported at higher levels in response to the threat statements scenario and were reported at higher levels by females. As can be seen from Table 4.11, the main effect of gender was significant, and RCMAS anxiety was a significant covariate. There were no significant two way interactions, however the three way interaction was again significant.

Correlations between reported cognitions and state anxiety

Table 4.12 reports the correlations between the STAIC and STAI state anxiety and p-state and n-state subscales with the three TCL scales. Hierarchical regression analyses were used to assess whether state anxiety was still significantly correlated with the TCL subscales after controlling for trait anxiety. Possible interactions between state and trait anxiety in making additional contributions were also assessed by including their product as a predictor. As indicated in the table the contributions of these interactions were significant in some cases, indicating that in these cases trait anxiety does have an effect on these scales of the TCL in interaction with state anxiety. Part correlations calculated through these regression analyses are included in Table 4.12. There were no notable differences between the initial correlations and the part correlations, which all retained their level of significance after allowing for the effect of trait anxiety. Accordingly trait anxiety does not significantly alter the relationship between state anxiety and scores on the scales of the TCL.

Table 4.12: Correlations (r) and part correlations (r_p, controlling for STAIC and STAI trait anxiety) between STAIC state anxiety, p-state, n-state and STAI state anxiety with the three scales of the operation, friends and shark TCL.

	Cognition Checklist Scales		
	Positive	**Coping**	**Threat**
Operation			
STAIC	r=-0.46*	r=0.39*	r=0.61*
n=166	r_p=-0.46*$_i$	r_p=0.38 *	r_p=0.57*
P-state	r=-0.42*	r=0.30*	r=0.49*
n=161	r_p=-0.42*$_i$	r_p=0.29*	r_p=0.48*
N-state	r=-0.45*	r=0.40*	r=0.63*
n=160	r_p=-0.45*	r_p=0.38*	r_p=0.58*
STAI	r=-0.75*	r=0.20	r=0.79*
n=59	r_p=-0.79*	r_p=0.20	r_p=0.78*
Friends			
STAIC	r=-0.52*	r=0.10	r=0.60*
n=166	r_p=-0.48*	r_p=0.09	r_p=0.54*
P-state	r=-0.52*	r=0.04	r=0.47*
n=161	r_p=-0.50*	r_p=0.04	r_p=0.44*$_i$
N-state	r=-0.41*	r=0.20*	r=0.65*
n=160	r_p=-0.36*	r_p=0.19*	r_p=0.59*
STAI	r=-0.51*	r=0.20	r=0.54*
n=59	r_p=-0.52*	r_p=0.20	r_p=0.53*
Shark			
STAIC	r=-0.45*	r=0.28*	r=0.51*
n=166	r_p=-0.42*	r_p=0.25*	r_p=0.46*$_i$
P-state	r=-0.41*	r=0.24*	r=0.45*
n=161	r_p=-0.43*	r_p=0.25*	r_p=0.44*
N-state	r=-0.44*	r=0.32*	r=0.53*
n=160	r_p=-0.42*	r_p=0.31*	r_p=0.51*
STAI	r=-0.53*	r=0.57*	r=0.66*
n=59	r_p=-0.53*$_i$	r_p=0.58*$_i$	r_p=0.66*$_i$

*=p<0.05

r_p denotes part correlation after allowing for the effect of RCMAS trait anxiety.

$_i$ indicates that there is a significant additional contribution due to the interaction of trait and state anxiety when the product is included in the regression equation.

Discussion

Methodological issues

Sample characteristics

As for the previous experiments, trait anxiety has been investigated to assess whether the sample used in this experiment accurately reflects the normal population. Mean trait anxiety scores for the STAIC were within the normal range, and the percentage of scores more than one standard deviation above the mean were less than expected in a normal population. The measures of STAI trait anxiety were higher than those for the STAIC, and this is supported by the greater proportion of scores over one standard deviation above the mean. T scores of mean RCMAS scores for males and females show that in relative terms, anxiety increased across the grades, but for females this stays within the average range of scores. The sample employed in this study therefore appears representative albeit slightly lower than the normal population in terms of trait anxiety.

Analysis of variance results suggest that there was no effect of grade or gender on the STAIC trait anxiety scale. This is in contrast to experiment 3, where STAIC trait anxiety decreased across the grades. Experiment 2 similarly revealed no effect of grade on STAIC trait anxiety, therefore the samples from the previous experiment and the current one are not equivalent in terms of the developmental profile of STAIC trait anxiety. In experiment 1 there was also a significant grade effect on STAIC trait anxiety.

ANOVA results show that there was no effect of gender or grade on RCMAS raw scores in the current experiment. In experiment 3 there was a decrease in RCMAS across grades, and a significant effect of gender, while in experiment 2 there was an effect of gender but not grade. In light of these findings, it is difficult to compare the developmental results of these three experiments.

Baseline, neutral and induced state anxiety

Mean measures of STAIC and STAI state anxiety were within the average range for baseline and neutral state anxiety, apart from grade 10 male participants whose mean scores for the neutral scenario were well below average. As in the previous experiment, there were no effects of grade or gender on baseline or neutral state anxiety scores (although grade 10 females reported significantly higher state anxiety in responses to the neutral scenario compared with males). After each of the three anxiety-inducing scenarios, mean female STAIC scores were at least two standard deviations above the norm, while male STAI and STAIC state anxiety scores were at least one standard deviation above the norm. Grade 10 females did not report such high levels of state anxiety, but their mean scores were still were at least one standard deviation above the norm. These findings suggest that the anxiety induction procedure was effective. Further, there were significant differences between the baseline measures and the induced measures of state anxiety and between neutral measures and induced state anxiety. These findings are consistent with the experiment 3 findings. State anxiety after the neutral scenario was significantly lower than at baseline, which is also consistent with experiment 3. As suggested in the previous chapter, this may have been either because the neutral scenario was in itself relaxing, or simply because the participants had become more relaxed in the situation by the time they completed the STAIC and STAI for the neutral scenario.

Hypothesis 1: TCL responses by scenario presentation condition

The TCL was designed as a validity check to ensure that participants could report back as their own the cognitive content with which they had been presented during the scenarios. Since the coping and threat scales have been found to correlate with measures of trait anxiety, analyses have taken this into account. It was hypothesised that participants would report significantly more cognitions on the TCL scale corresponding to the scenario condition with which they were presented than cognitions on the other two scales. This hypothesis was confirmed for the positive statements scale and the threat statements scale of the operation TCL, that is, those given the positive condition reported more positive statements than those given the other scales, and those in the threat condition reported back more threat statements than those given the other conditions. The hypothesis was also confirmed for all scales of the friends form of the TCL, with participants reported back more positive, coping and threat statements in their respective presentation conditions. There was no support for the hypothesis on the shark TCL, as there was no effect of presentation condition on any of the three scales of this measure. Perhaps the threatening nature of the shark scenario interfered with the reporting of cognitions.

Hypothesis 2: Correlations between trait anxiety and TCL scales

It was hypothesised that the threat statements and coping statements scales of the TCL would be significantly positively correlated with measures of trait anxiety, and that the positive statements scale would not be correlated with trait anxiety. The positive statements scale of the operation TCL was not correlated with any of the measures of trait anxiety, which was consistent with the findings of the previous experiment, and confirmed the hypothesis. The threat statements scale of the operation TCL correlated positively with the STAIC and RCMAS but not the STAI, which again is consistent with the previous experiment and confirms the hypothesis. No significant positive correlations were found between the STAI and the coping statements scale of the operation TCL in this experiment, where the previous experiment had found significant positive correlations between the coping statements scale and all measures of trait anxiety. However significant positive correlations were found between the coping scale and the RCMAS. These findings are consistent with previous research which suggests that positive statements are not related to trait anxiety (Fox et al., 1983; Prins et al., 1981), and that coping and threat statements are positively related to trait anxiety (Fox et al., 1983; Houston et al., 1984; Prins, 1986; Zatz & Chassin, 1983, 1985).

The positive statements scales of the friends and shark forms of the TCL were both negatively correlated with STAIC trait anxiety, but not with RCMAS or STAI trait anxiety. The hypothesis that the positive statements scales of the TCL would not be correlated with trait anxiety could not therefore be supported by these findings. The coping statements scale was not correlated with trait anxiety on the friends TCL. On the shark TCL there was a positive relationship between coping statements and only the STAIC trait anxiety, which is consistent with previous research which has established this link, and confirms the hypothesis (Fox et al., 1983; Houston et al., 1984; Prins, 1986; Zatz & Chassin, 1983, 1985). It is therefore possible that coping statements are not related to trait anxiety in all situations. Finally, the threat statements scales of the TCL were found to correlate positively with STAIC and RCMAS trait anxiety on the friends and the shark forms of the TCL but not with STAI trait anxiety, which is also consistent with experiment 3, and again confirms the stated hypothesis.

Hypothesis 3: Intercorrelations between TCL scales

As in the previous experiment, intercorrelations between the scales of the TCL were calculated to assess the relationships between the three scales, and partial correlations were calculated which controlled for RCMAS trait anxiety. It was hypothesised that the coping statements and threat statements scales would be significantly positively correlated with one another, and significantly negatively correlated with the positive statements scale. There were positive correlations between the threat statements scales and coping statements scales for each form of the TCL, and these correlations remained relatively unchanged in the partial correlations. There were negative correlations between the positive statements scale and the threat statements scale for each form of the TCL, and again these remained relatively unchanged for the partial correlations. These findings confirmed the hypothesis, thus replicating the findings of experiment 3 and generalising these findings to the shark and friends scenarios.

There were no significant correlations between the coping statements scale and the positive statements scale in the operation and friends forms of the TCL, and a negative correlation between the coping statements and positive statements scale in the shark form of the TCL. This was unlike experiment 3, where a positive correlation was found between the coping and positive scales of the operation form of the TCL. These findings suggest that the coping statements scale of the shark TCL has a different structure to the equivalent scale used with the other scenarios. This may reflect the nature of the coping statements on this scale, where they often related to escaping the situation.

Theoretical issues

Hypothesis 1: State anxiety by grade

It was hypothesised that there would be a significant effect of grade on the level of state anxiety induced by the three scenarios, and that this would be shown in an inverted 'U' pattern, with higher state anxiety in grade 5 participants. When STAIC state anxiety data were analysed across grades for all scenarios, controlling for the effect of trait anxiety, state anxiety increased across the grades. The grade effect was not consistent with the previous experiment where state anxiety increased in grade 5 and decreased again in grade 7. Since ANCOVA has been used, it is unlikely that this is due to the differences in the levels of trait anxiety across the grades. When each scenario was assessed separately using ANCOVA, the effect of grade was significant for the operation and shark scenarios, but not the friends scenario despite trait anxiety being a significant covariate for all three scenarios.

There was an interaction between presentation condition and grade for all three scenarios. This interaction shows that state anxiety increased significantly across the grades in the positive condition, but there was no effect of grade in the other two conditions. At grade 3 level the effect of the positive statements condition is far more marked than it is in grade 7, in fact there appears to be little change in the state anxiety levels of those in the coping and threat statements conditions across the grades for all three scenarios. This suggests that the positive statements were more effective in ameliorating the effect of the anxiety-inducing scenarios in the younger children. When analyses assessed the effect of presentation condition separately for each grade for the operation scenario, grade 3 was the only grade which showed an effect of presentation condition. There was no effect of presentation condition in the higher grades. With the friends scenario, there was a significant effect of presentation at grade 3 and grade 7, and for the shark scenario the effect of presentation condition was only significant at grade 3.

Hypothesis 2: Gender differences in state anxiety

It was hypothesised that female participants would report significantly higher levels of state anxiety in response to all three scenarios. This hypothesis was supported despite trait anxiety being a significant covariate for all of the scenarios, replicating the findings of experiment 3 and generalising these findings to the shark and friends scenarios. These gender differences are also consistent with other research (e.g., Ferrari, 1986; Gullone & King, 1992b; Ollendick & King, 1991).

In addition to these findings, ANCOVAs for the change between baseline and induced state anxiety by gender with trait anxiety as a covariate were calculated. Results revealed that trait anxiety was not a significant covariate for any of the scenarios, but that there was a significant effect of gender on STAIC state anxiety change for the operation and the shark scenarios. This effect indicated that while there was no gender difference in state anxiety responses at baseline, after anxiety induction, females reported significantly higher levels of state anxiety than males. What is important here is the fact that there were no gender differences in state anxiety at baseline, therefore, these results suggest that females were more reactive to the anxiety induction procedures. For the STAI data, trait anxiety was a significant covariate for the all scenarios, but there was no effect of gender on any of the scenarios. This suggests that females are more reactive to anxiety induction, but that this only occurs in the younger group of participants. Once participants reach grade 10, the effect is not found. These findings are consistent with the findings of experiment 3. There have been few studies which specifically address gender differences in anxiety, and none which demonstrate an effect of gender on the increase in state anxiety after anxiety induction, or which demonstrate this effect occurring only in a younger population.

Hypothesis 3: Impact of positive statements on state anxiety levels

It was hypothesised that participants in the positive statements scenario condition would report significantly lower levels of state anxiety than those in the coping or threat scenario conditions. Analyses revealed that there was a significant main effect of presentation condition on STAIC state anxiety, and that STAIC state anxiety was lowest in the positive statements condition, followed by the coping statements condition and then the threat statements condition. This effect was found despite the fact that trait anxiety was a significant covariate for state anxiety in all three scenarios. This effect was not replicated in the older group who completed the STAI, which is consistent with the findings in the previous study. As previously discussed, there were significant interactions between grade and presentation condition in all three scenarios which revealed that positive statements were more effective in ameliorating anxiety in grade 3 participants than the other grades, which is probably consistent with the finding which indicated that there was no effect of the positive statements scenario in the older group who completed the STAI. There was also an interaction between scenario and presentation type, which showed that positive statements were more effective in reducing state anxiety in the operation and friends scenarios than in the shark scenario. The shark scenario induced the highest levels of state anxiety overall, so it is possible that the positive statements were less effective in ameliorating state anxiety at these higher levels.

Hypothesis 4: TCL scale by grade

It was hypothesised that there would be no effect of grade on reported cognitions in any of the scenarios. Data were analysed using ANCOVA, with RCMAS trait anxiety as a covariate. As there were three separate TCL forms, one for each scenario, this section will deal with each form of each TCL form in turn.

RCMAS anxiety was a significant covariate for the coping and threat scales of the operation TCL, but not the positive scale, which is consistent with the findings of the previous experiment. The positive statements scale of the operation TCL revealed no significant effect of grade. These results have not replicated the findings in experiment 3, and have not supported the hypothesis.

There was a significant effect of grade on the coping statements scale of the operation TCL, where grade 3 and 7 participants produced higher levels of coping statements than grade 5 and grade 10 participants, where there was a marked reduction in the number of reported coping statements. Again the interaction between presentation condition and grade was significant. This interaction showed that while the number of coping statements reported in the coping and threat statements condition remained reasonably consistent, the number of coping statements reported in the positive condition were high in grades 3 and 7, and low in grades 5 and 10. This interaction was not consistent with that reported for the equivalent data in experiment 3, and has not supported the stated hypothesis.

The threat statements scale of the operation TCL did not show a main effect of grade, and there were no significant interactions with grade. In experiment 3 there was no effect of grade on either of the TCL threat statements scales, so this has replicated the previous experiment.

RCMAS anxiety was a significant covariate only for the threat scale of the friends TCL. For the positive statements scale of the friends TCL there was no effect of grade and there were no significant interactions with grade, thus supporting the hypothesis. For the coping statements scale of the friends TCL there was a significant effect grade which suggested that coping statements increased to grade 7, and then decreased in grade 10. For the threat statements scale of the friends TCL there were no grade effects and there were no significant interactions with grade. These data show some consistency with the findings for the operation scenario and the previous experiment.

For the shark scenario, RCMAS was a significant covariate for the coping and threat scales. There was a significant main effect of grade on the positive statements scale of the shark TCL, which showed that positive statements decreased across the grades. This is consistent with the increase in state anxiety responses to the shark scenario across the grades reported earlier. There were no interactions with grade on the shark TCL positive statements scale. There were no significant main effects of grade on the coping statements or threat statements scales of the shark TCL, and there were no interactions with grade on these scales. In summary these findings are generally consistent with the results found in the operation scenario in the previous experiment and therefore give some support to the hypothesis.

In summary, the operation TCL data collected in this experiment has to some extent replicated the findings of experiment 3 in relation to the effect of grade. It appears that there is little evidence of age related changes in the production of the three types of cognition measured in these three scenarios. There is some evidence to suggest that there is a decrease in positive statements across the grades on the positive statements scale of the shark TCL, which was consistent with the increase in state anxiety in response to the shark scenario.

Hypothesis 5: Gender differences in TCL scales

It was hypothesised that females would report more threat and coping statements and less positive statements on the operation, friends and shark forms of the TCL.

Once trait anxiety is taken into account, females reported significantly more coping statements on the coping statements scales of the operation and shark forms of the TCL and significantly more threat statements on the shark TCL. Males reported significantly more positive statements on the friends and shark forms of the TCL. There were no interactions between gender and other factors. While these results do not provide complete support for the hypothesis, it is clear that there are some gender differences in the number of reported cognitions, and that these are consistent with the hypothesis. Participants reported the highest levels of state anxiety in response to the shark scenario, and it is in the shark TCL that gender differences occur in all three scales. This suggests that gender differences are more likely to come to the fore in situations of high induced state anxiety. This finding is consistent with the finding which has shown that gender differences only become evident in situations of induced state anxiety.

Hypothesis 6: Correlations between state anxiety and TCL scales

It was hypothesised that there would be significant positive correlations between state anxiety and the coping statements and threat statements scales of the TCL, and significant negative correlations between the positive statements scale of the TCL and state anxiety in all three scenarios. Since correlations between trait anxiety and the scales of the TCL are important in understanding the relationships between anxiety and cognition, these findings are also included in this discussion. Hierarchical regressions analyses have also been conducted, taking into account the role of trait anxiety and possible interactions between state and trait anxiety by including the product of the two measures in the regressions.

The current experiment has succeeded in replicating some of the correlations between trait anxiety and cognition measures reported in experiment 3 for the operation scenario. In the previous experiment, the positive statements scale of the operation TCL was not correlated with any measures of trait anxiety, and the same was true for the current experiment. In the current experiment the positive statements scale of the operation TCL was negatively correlated with STAI and STAIC state anxiety (and both the subscales of p-state and n-state anxiety) in this and the previous experiment. In this experiment, there was a significant effect of the product term for STAIC state anxiety and p-state anxiety, indicating that trait anxiety is related to these measures, but only in interaction with state anxiety. Part correlations indicate that the relationship between positive statements and the various measures of state anxiety remain relatively unchanged once trait anxiety has been taken into account.

There were positive correlations between the coping statements scale and all measures of trait anxiety in the previous experiment, but in the current experiment there were only correlations between this scale and the RCMAS. The coping statements scale of the operation TCL was positively correlated with STAI and STAIC state anxiety (and both the subscales of p-state and n-state anxiety) in this and the previous experiment, and there was no effect of the product term. The correlations remain relatively unchanged when trait anxiety is controlled for via the part correlations.

Finally, in experiment 3 the threat statements scales was positively correlated with STAIC trait and RCMAS, and in the present experiment equivalent results were found. The threat scale was positively correlated with all measures of state anxiety in this and the previous experiment, and again, part correlations indicate that trait anxiety does not significantly effect these results.

The results from the operation scenario suggest that while reported positive statements are not correlated with trait anxiety, they are negatively correlated with state anxiety (although trait anxiety does play a role in interaction with STAIC state anxiety and p-state anxiety). Coping and threat statements on the other hand correlate positively with both trait and state anxiety. These findings replicate the findings of experiment 3.

The findings were not however replicated with the friends and shark scenarios. Firstly, the coping statements scales of the TCL were not correlated with trait anxiety in the friends or the shark scenario, with the exception of a very weak correlation between the coping statements scale and STAIC trait anxiety in the shark scenario. In the friends scenario, coping statements were correlated significantly only with n-state anxiety. In the shark scenario, they were positively correlated with all measures of state anxiety. Again, part correlations indicate that the role of trait anxiety in these correlations is not important, the correlations remain relatively unchanged when trait anxiety is controlled for.

The threat statements scales in the friends and the shark scenarios were positively correlated with STAIC and RCMAS trait anxiety, but not STAI trait anxiety. Results showed that the threat statements scales correlated negatively with state anxiety (including p-state and n-state) in both the friends and shark scenarios, and these did not vary significantly when trait anxiety was taken into account.

In both of the friends and the shark scenarios, positive statements correlated negatively with STAIC trait anxiety. Both of these correlations would be considered small (Cohen, 1992). Correlations between the TCL scales and state anxiety in the friends and shark scenarios showed that the positive statements scales correlated negatively with all measures of state anxiety and only the STAI state anxiety was impacted on by the product of state and trait anxiety. These correlations did not vary after trait anxiety was taken into account.

In summary the threat statements scale is consistently positively correlated with trait and state anxiety in all three scenarios. The correlations between the threat statements scales and state anxiety are consistently stronger than the correlations between the threat statements scales and trait anxiety. The coping statements scales of the TCLs on the other hand show strong consistent correlations with state anxiety in the shark and the operation scenarios, but are correlated only weakly with trait anxiety in these scenarios, with this the strongest correlation found in the operation scenario. The positive statements scale of the TCL shows strong consistent negative correlations with state anxiety (including both p-state and n-state), but only limited correlations with trait anxiety. Part correlations calculated through hierarchical regression analysis indicate that when trait anxiety is controlled for there is no notable change in any of these correlations.

Conclusions

This chapter has described the fourth and final experiment in the thesis. It aimed to replicate and generalise the findings of experiment 3. The sample who participated in this experiment was not equivalent to the sample who participated in experiment 3 in terms of trait anxiety, so the inclusion of trait anxiety as a covariate or controlling for it in correlational analyses is particularly important. The anxiety induction procedure has again been effective, and state anxiety in response to the three scenarios was significantly higher than baseline measures of state anxiety and state anxiety in response to the neutral scenario.

Three methodological hypotheses were posed in this experiment, and the findings in relation to these are summarised as follows:

1. There were significantly more positive statements reported in response to the operation and friends forms of the TCL in the positive condition than in the other conditions. There were also significantly more coping statements reported in response to the coping condition than in other conditions in the friends scenario. There were significantly more threat statements reported in response to the operation and friends forms of the TCL by those in the threat conditions than in the other conditions. So, there was support for this hypothesis on the operation and friends forms of the TCL, but not on the shark form of the TCL.
2. There were significant positive correlations between the trait anxiety and threat statements scales for the operation, friends and shark forms of the TCL. The coping statements scales of the operation and shark TCL showed limited positive correlations with trait anxiety. The positive statements scales of the friends and shark TCL also showed limited negative correlations with measures of trait anxiety.
3. There were significant positive correlations between the threat statements scales of all forms of the TCL with the coping statements scales. There were significant negative correlations between the threat statements scales of all forms of the TCL with the coping statements scales. There was a significant negative correlation between the coping statements scale and the positive statements scale of the shark TCL.

Six theoretical hypotheses were proposed in this experiment, and the findings in relation to these are summarised as follows:

1. There were some significant effects of grade on state anxiety levels in response to the three scenarios, however, these were not consistent with the grade effects found in experiment 3. The developmental effects which were reported show that state anxiety becomes less able to be reduced by positive statements as age increases.
2. Female participants reported significantly higher levels of state anxiety in response to all three scenarios. The gender effects in this experiment have been consistent with the previous experiment, which suggest that while there are no differences between genders on state anxiety at the baseline level, but that differences become apparent when males and females are placed under anxiety-inducing circumstances. This effect was not evident in the grade 10 participants.
3. There was a main effect of presentation condition on state anxiety which revealed that those in the positive statements condition reported significantly less state anxiety than those in the other conditions. The interaction between grade and presentation condition revealed that this anxiety reducing quality of positive statements was limited to participants in grade 3.
4. There were no consistent effects of grade on TCL scales, thus giving limited support to this hypothesis.
5. Females reported significantly more threat statements and coping statements on the TCL, and males reported significantly more positive statements on the TCL, but these effects were not found on all forms of the TCL.

6. Positive statements were strongly and consistently negatively correlated with state anxiety, but they did not show such a strong or consistent relationship to trait anxiety, while threat statements appear to be related to both state and trait anxiety. Coping statements were positively correlated to state anxiety in the operation and shark scenarios, but showed weaker and less consistent relationships to trait anxiety.

The final chapter in the thesis will consider these findings more thoroughly in light of methodological issues and will give an integrated interpretation of the findings in relation to previous research. Consideration will also be given to directions for future research.

Chapter 10: Summary of Methodological and Theoretical Findings and Implications for Future Research

The preceding four chapters have described the four experiments which comprise the thesis. These experiments have been guided by the literature reviewed in Chapters 2, 3 and 4 and the hypotheses set out in Chapter 5. The discussion section of each chapter has outlined how each experiment has answered these hypotheses.

Chapter 6 described the first experiment of the thesis, where three fear stimuli were selected as the basis for anxiety induction in the following experiments. These items were selected on the basis of the responses of 311 children aged from 9 years to 15 years.

Chapter 7 described experiment 2 of the thesis which developed these three items into scenarios which were used to induce anxiety in children and adolescents. The think-aloud method was used to collect the cognitive responses of 121 children aged from 9 to 15 years of age. These cognitions were categorised into positive statements, coping statements, internal threat statements and external threat statements. This experiment found little evidence of developmental or gender differences in the presentation of these cognitions. The experiment demonstrated some correlations between the cognition measures and measures of anxiety.

Chapter 8 described experiment 3, which used some of the cognition data collected in experiment 2 as anxiety stimuli, to assess how these cognitions differentially affected state anxiety in participants in response to the operation scenario. The results were based on the STAI and STAIC state anxiety reports and the Thoughts Checklist (TCL) responses of 311 children aged between 9 and 15 years of age. Significant developmental effects were found in relation to state anxiety.

Chapter 9 described experiment 4, which attempted to replicate the findings of experiment 3 and then to generalise them to other situations. The results of this experiment were based on the STAI and STAIC state anxiety reports and the TCL responses of 242 participants in response to three different scenarios. The developmental profiles for STAIC state anxiety found in the previous experiment were not replicated. However, consistent developmental profiles were found in response to all three scenarios. Results suggest that positive statements lower reports of state anxiety, but this effect is primarily found in grade 3 participants.

This final chapter will be divided into three main sections. Firstly consideration will be given to some of the most important methodological issues raised by the four experimental chapters. Secondly the theoretical findings of the experimental chapters will be discussed in relation previous research. Finally, considerations will be given to directions for future research.

Methodological issues

Data analysis

Chapter 5 stated that the alpha level to be used in the four experiments of the thesis would be 0.05. At this point it is important to underline the reasons for this decision, as the use of 0.05 alpha level with the number of tests used in these four experiements would normally be considered inadequate. No conclusion in this series of experiments rests on the findings of one statistical test, each finding has been either replicated in a subsequent experiment, or shown to be true in different parts of the one experiment. The research progress has been cumulative and based on investigating similar problems from a range of different directions, therefore the chances of type one errors occurring has been adequately minimised.

The think-aloud method

The think-aloud method was originally chosen because it allows participants to report their own thoughts, rather than constraining them to items on a checklist, and it allows participants to report thoughts as they happen (or as close to as possible). Genest and Turk (1981) suggest that it is appropriate to use such a method in the early stages of research, as it allows collection of unanticipated yet relevant information. Ericsson and Simon (1980) suggest that because of this, the think-aloud method more accurately reports the essential characteristics of the cognitive products. The think-aloud method is not reliant on retrospective memory and distortions, and therefore minimises participants' causal inferences (Genest & Turk, 1981). This method was therefore seen as a means of gaining data on the cognitive activity of children under experimentally induced anxiety.

Research using the think-aloud method with children (Diener & Dweck, 1978; Fox, Houston & Pittner, 1983; Houston, Fox & Forbes, 1984) has shown that it can be effectively used to stimulate self talk. However, the data collected in this experiment were problematic. Firstly, participants reported relatively few cognitions. This difficulty was magnified when the data were categorised, as the number of statements in any one category was small. In the case of positive statements, the mean number reported was as low as 0.06 in the shark scenario. Even the most prolific category, external threat statements, reached only a mean of 3.76 in the operation scenario. Secondly the range of responses was large, leading to standard deviations which usually exceeded the mean. The reason for this was probably that participants were given fairly free rein to report what they were thinking, with only the use of the two prompts to constrain them.

The studies by Fox et al. (1984) and Houston et al. (1985) constrained the output of their participants by allowing them two minutes in which to report their thoughts. In addition to this the experimenter was out of the room while the participant was reporting his or her thoughts in these studies, which probably helped participants to feel less self conscious. Genest and Turk (1981) suggest this is an important factor in the success of the think-aloud method. Given the fact that experiment 2 required children to respond to scenarios split into four sections, with responses required between each of these sections, it was decided that having the experimenter out of the room was not possible, as she was required to structure the think-aloud sessions. While analysis of covariance did control for the differing length of output by using total number of utterances as a covariate, the usefulness of these data is in question.

Informal observation suggested that even with the standard training that was afforded participants, some were reluctant to report their thoughts. This may have been due to self consciousness (as Genest and Turk, 1981, suggest), or perhaps the use of the imagery scenario did not produce thoughts as effectively as in vivo methods have done in past studies. Whatever the case, future research would need to evaluate this method before using it in this same manner. A pilot was completed prior to experiment 2, and children reported adequate amounts of data. This pilot may have used more verbal children, who were familiar to the researcher, and therefore had no difficulties producing relatively high output.

Imagery induced anxiety

The use of imagery to induce anxiety is recommended by Davison et al. (1983, 1985). This method has the advantage of providing a range of different anxiety stimuli which it would not be possible to implement with in vivo exposure. Hermecz and Melamed (1984) used imagery induction to assess physiological responses of children to dental treatment. Their study suggested that children given response imagery responded with heightened anxiety. It was for this reason that response cues were included in the imagery scenarios of experiment 2. These response cues were both physiological and emotional in nature and were taken from the STAIC and the RCMAS. In experiments 3 and 4, the response cues were replaced with cognitive responses. This form of anxiety induction has effectively induced anxiety in the participants in all the experiments which used the technique.

Results also demonstrated that responses to the anxiety induction scenarios were significantly higher than responses to the neutral scenario. It was also noted that the neutral scenario was associated with significantly lower levels of state anxiety than was reported at baseline. It is possible that the neutral scenario (an imagery scene about taking a walk down the child's street) was either anxiety reducing, or that participants became more relaxed after baseline when they were more aware of what was expected of them in the situation, and this was reflected in the neutral state anxiety scores.

Experiment 2 included an imagery questionnaire to assess the level of imagery that participants had achieved. This was based on the same model as that used by Hermecz and Melamed (1984) and is included in Appendices A3 to A5. Analysis showed that there was a significant positive correlation between the total number of reported cognitions and the level of reported imagery in the operation scenario, but not in the friends or shark scenarios. So, it is possible that greater clarity of imagery led to greater number of reported cognitions. It was encouraging to note that there were no correlations of the visual imagery scale with any of the anxiety scales, including the lie scale of the RCMAS.

In addition to this, the imagery method induced different levels of state anxiety according to the style of self talk that was included in the imagery scenarios in experiments 3 and 4. was sensitive to differences in presentation condition, as seen in experiments 3 and 4. So, it appears that the imagery induction technique used in these experiments was an effective means of inducing anxiety.

Use of the STAI for grade 10 participants

In the initial experiment of the thesis it was decided to use the STAIC for grade 3 to grade 7 participants and the STAI for grade 10 participants. This remained unchanged throughout the four experiments. This decision was made on the basis of the recommendations of the manuals, and of the study by Brown, O'Keeffe, Sanders and Baker (1986), which used similar age cut-offs for the use of these two measures. In addition, the content of the STAIC, was not considered age appropriate for most 15 year old students. The use of the STAI for grade 10 students made it difficult to compare state and trait anxiety across the grades. In retrospect, although the difficulties cited above are valid, it may have been more useful to employ the STAIC with all four grades.

Another option would have been to convert all STAI and STAIC scores to T scores to allow comparison across grades. There are three main reasons why this would not have been a sensible decision. Firstly, comparison of the T scores for the RCMAS, with the T scores for the STAIC and STAI indicates that the developmental profile of the RCMAS was not equivalent to the profile indicated by the T scores of the STAIC and STAI. Secondly, the STAI is scored on a four point scale, and the STAIC on a three point scale. Thirdly, the trait scale of the STAI includes both positively and negatively valenced items while the STAIC trait scale consists of only negatively valenced items.

The thoughts checklist

The TCL was designed for the experiment, based on the cognitive response items used in the imagery scenarios. Items were selected from the think-aloud cognition data reported in experiment 2. Each item was chosen by the researcher on the basis that it was a commonly reported cognition of the participants in response to the scenarios. These cognitions had been rated by two independent raters in experiment 2 indicating that they accurately represented the category which they represent. The positive scales of the three TCLs were based on fewer cognitions than the items on the coping and threat scales. In the shark scenario it was necessary to create new positive items as there were so few positive items reported in response to the shark scenario in experiment 2. It is possible therefore that the positive scales of the TCLs were not as valid as the other scales.

The TCL was firstly assessed for convergent construct validity, by correlating the scales of the TCL with measures of trait anxiety. Research suggests that there should be positive correlations of trait anxiety with the coping statements and threat statements scales (Fox, Houston & Pittner, 1983; Houston, Fox & Forbes, 1984; Prins, 1986), but it was not clear whether the positive statements scale would be negatively correlated with trait anxiety (e.g., Blankstein, Flett, Boase & Toner, 1990; Galassi et al, 1981; Zatz & Chassin, 1983, 1985), or show no correlation (Fox, et al., 1983; Kendall et al. 1991; Prins et al., 1994; Schwartz, 1986).

In both experiment 3 and 4, the threat statements scales of the TCL correlated positively with all measures of trait anxiety (although correlations with the STAI trait anxiety were not always significant), which supports the convergent validity of these scales, and supports previous theoretical findings. In experiment 3, the positive statements scale of the TCL was not correlated with trait anxiety, and in experiment 4 the positive scales of only the shark and friends TCL were negatively correlated with the trait scale of the STAIC. These findings suggest that while the positive statements scales do have a negative relationship with trait anxiety, this is limited. As will be discussed later, there was no measure of depression included in these experiments, so it is not possible to assess whether the positive statements scales correlate with depression, as was demonstrated by Ambrose and Rholes (1993).

The coping statements scales of the TCL showed variable correlations with trait anxiety depending on the scenario. In experiment 3, the coping statements scale was positively correlated with all measures of trait anxiety. In experiment 4 however, these correlations disappeared, only to be found between RCMAS and the operation TCL coping scale, and between the trait scale of the STAIC and the coping scale of the shark TCL. These findings suggest that the coping statements scale of the TCL showed less convergent validity than the other scales. This can probably be traced back to the coping cognitions reported in experiment 2 used to create the scale. It was coping statements which varied the most across the three scenarios, with very low levels in the operation TCL, followed by higher levels in the friends TCL and even higher levels in the shark TCL. It was suggested that responses to the coping scales varied as a function of the level of control that the individual felt he or she had over the various situations. Therefore, it seems that active coping, such as that included in the shark scenario, is not so highly correlated with trait anxiety as is the less action oriented coping included in the operation scenario.

Adequate internal validity has been demonstrated for most scales through the intercorrelations between the scales. Given the previous research, it would be expected that the threat statements and coping statements scales should correlate positively with each other, and these scales should show either no correlation or negative correlations with the positive statements scale. The operation TCL used in experiment 3 revealed that the threat statements and coping statements scales showed the expected correlations with each other. The strongest correlation was found between the two threat statements scales ($r=0.68$) in experiment 3. The positive statements scale was found to show negative correlations with both of the threat statements scales, but a positive correlation with the coping statements scale. In experiment 4, the coping statements scale was correlated positively with the threat statements scale on all three TCL forms, and the threat statements scale was correlated negatively with the positive statements scale on all three TCL forms. These findings remained unchanged when partial correlations were calculated to control for trait anxiety. These results support the internal validity of these scales by demonstrating that threat and coping statements are positively related, and positive statements are negatively related to threat statements. The coping statements scale however showed no correlation with the positive statements scale in the operation and friends scenarios, but was negatively correlated with the positive statements scale in the shark scenario. It appears that the validity of the coping statements scale of the TCL is doubtful and varies according to the TCL form.

Glass and Arnkoff (1982) suggest that cognitive questionnaires can be responded to as affective rather than cognitive questions. If this is the case, then the correlations between the TCL and the affective measures do not represent convergent validity, but concurrent validity. While every effort was made to ensure that participants responded to the TCLs as cognitive measures, there is still the possibility that they responded as if the items were affective. Participants sometimes had trouble understanding the TCL. Observation of the type of questions asked by participants suggested that they were trying to answer the items as if they were affective rather than cognitive. This particularly included items which were worded as questions, e.g., 'What will I do when I finish my lunch?'

The measurement of depression

These experiments did not include a measure of depression, as some studies in the area have (e.g., Ambrose & Rholes, 1993). The literature review investigated this issue, and concluded that scales such as the RCMAS, the STAIC and the STAI can at best be considered measures of negative affectivity, as can the CDI. Given that the experiments which comprise the thesis were concerned primarily with induced anxiety, as measured by state anxiety and the role of cognition in this, a scale of depression was considered irrelevant to this investigation. However, it is recognised that a measure of depression could have further clarified the role of positive statements.

Theoretical issues

Cognition, anxiety and grade

There have been two studies which have demonstrated developmental changes in the anxious thoughts of children, one which points toward an increase in coping strategies across the age range (Brown et al., 1985) and the other which points toward an increase in the reports of possible threatening consequences of situations (Vasey et al., 1994). On the basis of these studies, it would not have been surprising to find an increase in coping statements and threat cognitions across the grades. Vasey et al. (1994) found an increase in the ability to generate worrisome thoughts in children over the age of 8 years. They argued that the reason for the increased ability to worry across the age range is that children become more capable of elaborating the potential negative outcomes of a given situation as their age increases. The current experiments focussed only on children above 8 years of age. Perhaps this is the critical age. If so, it is possible that differences may be found in the reported cognitions of younger children.

The investigation of cognition occurred in two separate ways in the thesis. Firstly it was measured via the think-aloud method, and secondly it was measured on a checklist via the TCL. In addition to these direct measures of cognition, the effect of presenting different types of cognitions to participants was measured via the state anxiety responses of participants. This section will discuss the two direct measures of cognition and the impact of different types of cognition on state anxiety.

The major aim of experiment 2 was to assess whether there were any changes in the pattern of cognitions reported via the think aloud method according to grade. The important difference between this experiment and others which have assessed anxiety-related cognitions across the age range was that there was no difference in the reported state anxiety in response to the stimuli used to induce anxiety across the grades, so the scenarios induced equivalent levels of state anxiety in grades 3, 5 and 7. It is therefore argued that any changes in the number of reported cognitions across the grades are truly related to age level, and are not associated with differences in the fear responses to the stimulus items.

The think-aloud results of experiment 2 demonstrated that the children under investigation reported cognitions which could be categorised as positive statements, coping statements, internal threat statements and external threat statements. The most frequently reported cognitions were external threat statements. The least frequently reported cognitions were positive statements. While there were some problems with the think-aloud data, which have been outlined previously, the important finding of this experiment was that there was no effect of grade on the number of reported cognitions for any of these four categories.

Experiments 3 and 4 assessed cognitions via the TCL. The TCL questionnaires were designed primarily to assess how effectively the different presentation conditions had impacted on the cognitions of participants, and they were generally found to reflect the cognitive content of the scenarios. However they have also been used as a measure of internal thoughts in response to the scenarios. There were few clear consistent effects of grade on the TCL responses of participants.

Perhaps the major finding of the thesis was that state anxiety can be affected by the type of cognitions that are presented to participants with an anxiety-inducing scenario. The results of the final two experiments revealed that state anxiety was lower in those participants given the positive statements scenario. To reiterate, positive statements include positive self statements (e.g., 'I am good at making friends', 'I can cope with this') and positive affect statements (e.g., 'I feel OK', 'I'm feeling relaxed about this'). The data therefore show that positive statements are capable of ameliorating state anxiety levels in children.

Further investigation of the ameliorating effect of positive statements on state anxiety in experiment 4 showed clear consistent interactions between grade and presentation condition. These interactions showed that the effect of positive statements is most evident at the grade 3 level for all scenarios. Perhaps the most likely reason for these interactions is that the younger children are more easily influenced by the positive statements in the scenario, while older children focus on the factual content of the scenarios, rather than the cognitive content of the scenarios. Further to this, experiments 3 and 4 demonstrated that there was no effect of presentation condition on grade 10 participants. There was little evidence to suggest that TCL positive statements were actually more prevalent in the younger group of children, although the operation scenario showed that positive statements were more prevalent in grade 3 participants in the coping and positive statements conditions. This finding suggests that younger children may be more receptive to cognitive behavioural programs aimed at reducing anxiety, such as those developed by Barrett, Dadds and Rapee (1996).

The findings of experiment 3 and 4 also revealed that positive statements were consistently negatively correlated with state anxiety, which further supports the finding that the use of positive statements in imagery scenarios ameliorates state anxiety. This finding suggests that trait anxiety and state anxiety have different relationships with positive statements. Previous studies have not assessed the relationship of cognition with state and trait anxiety separately. Measures of state anxiety are rarely taken, and when they are, they tend to be used to show that anxiety has been heightened by the experimental procedure (e.g., Galassi et al., 1981; Prins et al., 1994). Prins et al. (1994) demonstrated that positive self evaluations are related to test performance, but they did not take the further step required to show whether they are related to state anxiety. These findings may help to clarify the understanding of the role of positive statements in anxiety.

Kendall et al. (1991) proposed that anxiety is associated with increased negative cognitions, not decreased positive statements, that is, it is the 'power of non-negative thinking' which ameliorates anxiety. The low correlations between trait anxiety and reported positive statements in these experiments are probably not enough to dispute this position. However, the strong negative correlations between reported positive cognitions and state anxiety which are demonstrated consistently in experiments 3 and 4, suggest that this position is untenable in the case of state anxiety. These studies have shown that positive statements are implicated in the experience of state anxiety, and further that in some cases (particularly grade 3 children), they act to reduce state anxiety in comparison to threat and coping cognitions.

Watson and Clark (1984) suggest that state anxiety (as measured by the STAI) is not a pure measure of transient negative affectivity, but also measures a more general happiness/ unhappiness dimension. Watson and Clark (1984) argued that some items on this scale reflect negative affectivity (for example, jittery, nervous and upset as well as relaxed and calm) while others reflect more general happiness/ unhappiness items (for example, joyful and content as well as regretful). Given the above argument, the state anxiety scale of the STAIC would be expected to show a factor structure which reflects these dimensions. Previous research using baseline measures of state anxiety (Cross & Huberty, 1993; Dorr, 1981; Papay & Hedl, 1978) and the results of experiment 2, which used high levels of state anxiety, show that the items fall neatly into two factors which represent the positively and negatively valenced items of the scale. So, it is possible that these two factors represent positive and negative affectivity respectively, rather than the items which Watson and Clark (1984) suggest. If this were the case, it would be expected that positive statements would correlate with the p-state scale, and not the n-state scale. However, data show that the positive statements scale of the TCL correlates with both scales of the STAIC state anxiety at an equivalent level, even when trait anxiety is controlled for. This does not answer the question of why positive statements show strong correlations with state anxiety, but weak or non existent correlations with trait anxiety.

It has been demonstrated that anxiety is related to self esteem (Rawson, 1992). High self esteem is understood to reflect a positive perception of personal worth. Research has shown that self esteem correlates negatively with self report measures of anxiety and depression (Rawson, 1992). Given that positive perceptions of self worth are central to high levels of self esteem, and the positive statements scale of the TCL includes positive self statements, it is not surprising that the positive statements scale of the TCL correlated with measures of anxiety. Further, a study reported by Matthews and Odom (1989) reports that self esteem is correlated with state anxiety, but not trait anxiety. Another study reported by Greenberg et al. (1992) shows that adults report lower levels of state anxiety in response to a stressor when given positive feedback about their personality. These studies are consistent with the findings reported in this study, and suggest that state anxiety is more closely related to positive self image than is trait anxiety.

The role of gender

Kashani, Orvaschel, Rosenberg, and Reid (1989) and Muris, Merckelbach, Mayer, and Meesters (1998) have shown that there are higher levels of anxiety disorders symptomatology among females. Ferrari (1986), Gullone and King (1992b) and Ollendick and King (1991) have demonstrated that females report higher levels of fear. The separate norms for males and females given in the manuals for all anxiety inventories used in the experiments (Reynolds & Richmond, 1985; Spielberger, 1973, 1983) reflect these findings. In the four experiments, females reported higher levels of trait anxiety on at least one of the measures of trait anxiety in each experiment. However, there were no significant differences between males and females in baseline state anxiety in the two experiments where this was measured (experiments 3 and 4), and there were no gender differences in response to the neutral scenario in experiments 3 and 4 apart from on the STAI in one scenario of experiment 4. However, STAIC state anxiety was significantly higher in females in response to the experimental scenarios in all instances apart from the shark scenario in experiment 2. (STAI state anxiety showed limited effects of gender, possibly due to smaller sample sizes.) These findings are supported by the significant interactions found between state anxiety measurement time (baseline/experimental state anxiety) and gender in all but the friends scenario in experiment 4. These findings suggest that females do not report higher levels of state anxiety in normal conditions, but that they are more reactive to anxiety induction than males.

Consistent gender differences were found in response to the TCL scales. In experiment 3, females reported significantly more coping, internal threat and external threat statements. In experiment 4, females reported less positive statements in response to the friends and shark scenarios, but more coping statements in response to the operation and shark scenarios, and more threat statements in response to the shark scenario. These findings support those reported elsewhere to suggest that females report less positive statements and more threat and coping statements (Brown et al., 1986; Houston et al., 1984; Prins et al., 1994; Zatz & Chassin, 1985). So, it seems that in addition to higher fear levels and higher levels of anxiety and anxiety disorders in females, there is evidence to suggest that females react more to anxiety producing situations and report more anxiety-related cognitions.

Future directions

Given the findings of the four experiments reported in the thesis, there are numerous directions that further research in this area could take.

Perhaps of most interest is the relationship between positive statements and anxiety. This research has suggested that positive statements show a far stronger and more consistent relationship to state anxiety than they do to trait anxiety. Further investigation of this phenomenon is warranted. As there were so few positive statements reported in experiment 2, it was not possible to assess the relationship between positive statements and anxiety. Given the problems associated with the use of self statements questionnaires however, further investigation of the relationship between positive statements and anxiety using another method of cognition measurement would further clarify this relationship. Positive statements are implicated in depression, so the inclusion of measures of depression could help to clarify further the role of positive statements in anxiety.

This research has also provided evidence that grade 3 children are more likely to show the ameliorating effects of positive statements than older children. This may simply show that younger children are more likely to be influenced by the researcher through the scenarios, or it may reflect a different means of processing such information in younger children. If the latter is the case, then treatment strategies for younger children with anxiety might include training in the use of positive self statements. Studies assessing the effectiveness of cognitive-behavioural approaches to anxiety treatment could investigate differences in the responses of children of different ages to cognitive restructuring activities. On the basis of the findings of the thesis, it is possible that younger children would be more responsive to such treatment strategies.

The results which demonstrate that females are more reactive to anxiety induction than males also warrant further investigation. While there have been studies which report gender differences in anxiety and fear, there have been none which have reported findings equivalent to these. These findings could have implications for the investigation of the development of anxiety disorders in females versus males. If females are more likely to react with greater increases in state anxiety than males, then this phenomenon may be one of the keys to explain why anxiety disorders are more common in females than males. Further, studies could assess this phenomenon in younger children to ascertain whether there is a certain age at which this phenomenon becomes evident.

In closing

The investigation which comprises the thesis has provided a greater understanding of anxiety and cognition in children and adolescents with particular reference to age and gender. Experiment 2 has demonstrated that when the anxiety-inducing qualities of a stimulus are equivalent for all ages, then there is no effect of age on the reported cognitions associated with this anxiety-inducing stimulus. This experiment has also shown that reported cognitions tend to vary according to the demands of a situation, and particularly that coping thoughts vary greatly according to the situation. Experiments 3 and 4 have shown that positive statements are implicated in anxiety, and that they are particularly relevant to state anxiety. Experiments 3 and 4 have also shown that gender is an important consideration in understanding anxiety in children, showing that girls are more reactive to anxiety stimuli than boys, which has not been demonstrated elsewhere. It has also been shown that females tend to report higher levels of anxiety-related cognitions than boys, and lower levels of positive statements. It has also been demonstrated that younger children are more likely to be influenced by positive statements than are older children. The questions posed in the thesis have aimed to broaden the understanding of the issues involved in anxiety and cognition in children and adolescents. It is hoped that these findings will spur others on to further investigate the role of cognition in the development of anxiety in children.

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Appendix A: Checklists and Questionnaires

A1: FSSC-II- Experiment 1

What Makes Me Scared

Name: ____________________
Age (in years): ________________
School: ____________________

Directions

Below are written a list of things that make some people scares. Read each one carefully and tick the box in front of the words that best describe how scared you are.

There are no right or wrong answers.

Remember, find the words that best describe how scared you are.

1	Being teased	☐NOT SCARED	☐SCARED	☐VERY SCARED
2	Rides like the big dipper	☐NOT SCARED	☐SCARED	☐VERY SCARED
3	Being alone	☐NOT SCARED	☐SCARED	☐VERY SCARED
4	Riding in a car or bus	☐NOT SCARED	☐SCARED	☐VERY SCARED
5	Being criticised by others	☐NOT SCARED	☐SCARED	☐VERY SCARED
6	Mice	☐NOT SCARED	☐SCARED	☐VERY SCARED
7	Losing my friends	☐NOT SCARED	☐SCARED	☐VERY SCARED
8	Being in closed places	☐NOT SCARED	☐SCARED	☐VERY SCARED
9	Going to the doctor	☐NOT SCARED	☐SCARED	☐VERY SCARED
10	Getting bad marks at school	☐NOT SCARED	☐SCARED	☐VERY SCARED
11	Our country being invaded	☐NOT SCARED	☐SCARED	☐VERY SCARED
12	Darkness	☐NOT SCARED	☐SCARED	☐VERY SCARED
13	Nuclear war	☐NOT SCARED	☐SCARED	☐VERY SCARED
14	Taking dangerous drugs	☐NOT SCARED	☐SCARED	☐VERY SCARED
15	Going to the dentist	☐NOT SCARED	☐SCARED	☐VERY SCARED
16	Having to talk in front of my class	☐NOT SCARED	☐SCARED	☐VERY SCARED
17	Violence on TV	☐NOT SCARED	☐SCARED	☐VERY SCARED
18	Spiders	☐NOT SCARED	☐SCARED	☐VERY SCARED
19	Murderers	☐NOT SCARED	☐SCARED	☐VERY SCARED
20	My parents criticising me	☐NOT SCARED	☐SCARED	☐VERY SCARED

21	Being in a fight	❑NOT SCARED	❑SCARED	❑VERY SCARED
22	Being kidnapped	❑NOT SCARED	❑SCARED	❑VERY SCARED
23	Getting a serious illness	❑NOT SCARED	❑SCARED	❑VERY SCARED
24	Meeting someone for the first time	❑NOT SCARED	❑SCARED	❑VERY SCARED
25	Fire	❑NOT SCARED	❑SCARED	❑VERY SCARED
26	Having an operation	❑NOT SCARED	❑SCARED	❑VERY SCARED
27	Having to go to school	❑NOT SCARED	❑SCARED	❑VERY SCARED
28	Someone in my family dying	❑NOT SCARED	❑SCARED	❑VERY SCARED
29	Making mistakes	❑NOT SCARED	❑SCARED	❑VERY SCARED
30	My parents arguing	❑NOT SCARED	❑SCARED	❑VERY SCARED
31	Cyclones	❑NOT SCARED	❑SCARED	❑VERY SCARED
32	Myself dying	❑NOT SCARED	❑SCARED	❑VERY SCARED
33	Being hit by a car or truck	❑NOT SCARED	❑SCARED	❑VERY SCARED
34	Being sent to the principal	❑NOT SCARED	❑SCARED	❑VERY SCARED
35	Ghosts or spooky things	❑NOT SCARED	❑SCARED	❑VERY SCARED
36	Being threatened with a gun	❑NOT SCARED	❑SCARED	❑VERY SCARED
37	Bushfires	❑NOT SCARED	❑SCARED	❑VERY SCARED
38	Not being able to breathe	❑NOT SCARED	❑SCARED	❑VERY SCARED
39	Getting punished by my dad	❑NOT SCARED	❑SCARED	❑VERY SCARED
40	Failing a test	❑NOT SCARED	❑SCARED	❑VERY SCARED
41	Drunk people	❑NOT SCARED	❑SCARED	❑VERY SCARED
42	Snakes	❑NOT SCARED	❑SCARED	❑VERY SCARED
43	My parents separating or getting divorced	❑NOT SCARED	❑SCARED	❑VERY SCARED
44	Getting an electric shock	❑NOT SCARED	❑SCARED	❑VERY SCARED
45	Someone in my family having an accident	❑NOT SCARED	❑SCARED	❑VERY SCARED
46	Getting lost in a crowd	❑NOT SCARED	❑SCARED	❑VERY SCARED
47	Having no friends	❑NOT SCARED	❑SCARED	❑VERY SCARED
48	Someone in my family getting sick	❑NOT SCARED	❑SCARED	❑VERY SCARED
49	Strange looking people	❑NOT SCARED	❑SCARED	❑VERY SCARED
50	Getting punished by my mum	❑NOT SCARED	❑SCARED	❑VERY SCARED
51	A burglar breaking into our house	❑NOT SCARED	❑SCARED	❑VERY SCARED
52	Having bad dreams	❑NOT SCARED	❑SCARED	❑VERY SCARED
53	Being alone at home	❑NOT SCARED	❑SCARED	❑VERY SCARED
54	Rats	❑NOT SCARED	❑SCARED	❑VERY SCARED
55	Going to a new school	❑NOT SCARED	❑SCARED	❑VERY SCARED
56	Earthquakes	❑NOT SCARED	❑SCARED	❑VERY SCARED
57	Getting an injection from a nurse or doctor	❑NOT SCARED	❑SCARED	❑VERY SCARED
58	Bees	❑NOT SCARED	❑SCARED	❑VERY SCARED
59	Sitting for a test	❑NOT SCARED	❑SCARED	❑VERY SCARED
60	Being bullied	❑NOT SCARED	❑SCARED	❑VERY SCARED
61	Getting my school report	❑NOT SCARED	❑SCARED	❑VERY SCARED

62	Thunder	❑NOT SCARED	❑SCARED	❑VERY SCARED
63	Lizards	❑NOT SCARED	❑SCARED	❑VERY SCARED
64	AIDS	❑NOT SCARED	❑SCARED	❑VERY SCARED
65	Creepy houses	❑NOT SCARED	❑SCARED	❑VERY SCARED
66	Tigers	❑NOT SCARED	❑SCARED	❑VERY SCARED
67	Dead people	❑NOT SCARED	❑SCARED	❑VERY SCARED
68	Getting lost in a strange place	❑NOT SCARED	❑SCARED	❑VERY SCARED
69	Thunderstorms	❑NOT SCARED	❑SCARED	❑VERY SCARED
70	Cemeteries	❑NOT SCARED	❑SCARED	❑VERY SCARED
71	Dingoes	❑NOT SCARED	❑SCARED	❑VERY SCARED
72	The sight of blood	❑NOT SCARED	❑SCARED	❑VERY SCARED
73	Looking foolish	❑NOT SCARED	❑SCARED	❑VERY SCARED
74	Flying in a plane	❑NOT SCARED	❑SCARED	❑VERY SCARED
75	Strangers	❑NOT SCARED	❑SCARED	❑VERY SCARED
76	Having to go to hospital	❑NOT SCARED	❑SCARED	❑VERY SCARED
77	Falling from high places	❑NOT SCARED	❑SCARED	❑VERY SCARED
78	Sharks	❑NOT SCARED	❑SCARED	❑VERY SCARED

A2: FSSC-II Shortened Version- Experiment 2

What Makes Me Scared

Name: ______________________
Age (in years): _________________
School: ______________________

Directions

Below are written a list of things that make some people scares. Read each one carefully and tick the box in front of the words that best describe how scared you are.

There are no right or wrong answers.

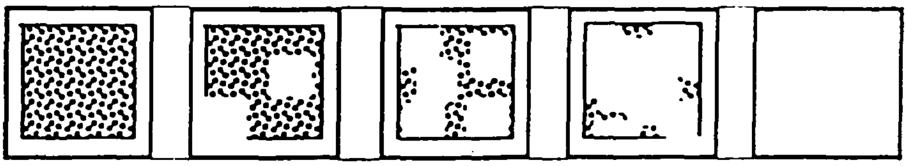
Remember, find the words that best describe how scared you are.

1	Losing my friends	❑NOT SCARED	❑SCARED	❑VERY SCARED
2	Being in closed places	❑NOT SCARED	❑SCARED	❑VERY SCARED
3	Our country being invaded	❑NOT SCARED	❑SCARED	❑VERY SCARED
4	Being teased	❑NOT SCARED	❑SCARED	❑VERY SCARED
5	Nuclear war	❑NOT SCARED	❑SCARED	❑VERY SCARED
6	Having to talk in front of my class	❑NOT SCARED	❑SCARED	❑VERY SCARED
7	Spiders	❑NOT SCARED	❑SCARED	❑VERY SCARED
8	AIDS	❑NOT SCARED	❑SCARED	❑VERY SCARED
9	Being kidnapped	❑NOT SCARED	❑SCARED	❑VERY SCARED
10	Getting a serious illness	❑NOT SCARED	❑SCARED	❑VERY SCARED
11	Having an operation	❑NOT SCARED	❑SCARED	❑VERY SCARED
12	Myself dying	❑NOT SCARED	❑SCARED	❑VERY SCARED
13	Being sent to the principal	❑NOT SCARED	❑SCARED	❑VERY SCARED
14	Violence on TV	❑NOT SCARED	❑SCARED	❑VERY SCARED
15	Not being able to breathe	❑NOT SCARED	❑SCARED	❑VERY SCARED
16	Someone in my family having an accident	❑NOT SCARED	❑SCARED	❑VERY SCARED
17	Having no friends	❑NOT SCARED	❑SCARED	❑VERY SCARED
18	Someone in my family getting sick	❑NOT SCARED	❑SCARED	❑VERY SCARED
19	Going to a new school	❑NOT SCARED	❑SCARED	❑VERY SCARED
20	Dead people	❑NOT SCARED	❑SCARED	❑VERY SCARED
21	Sharks	❑NOT SCARED	❑SCARED	❑VERY SCARED
22	Falling from high places	❑NOT SCARED	❑SCARED	❑VERY SCARED

A3: Visual Imagery Scale- Experiment 2 (Operation)

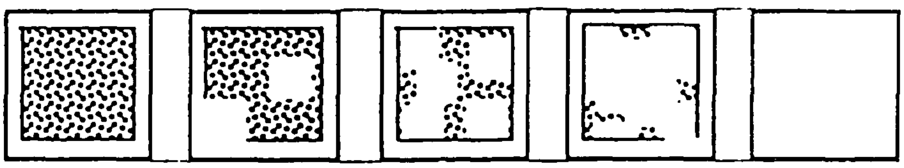
How Vividly Did You Imagine?
The Operation Scene

1. The hospital bed?



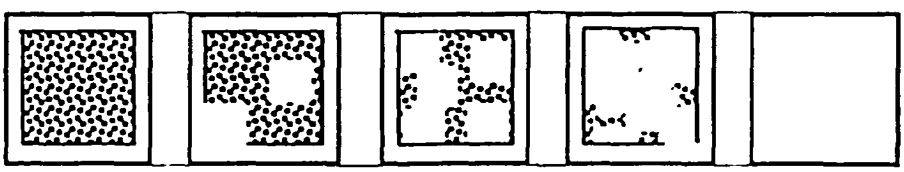
☐	☐	☐	☐	☐
Perfectly clear and as vivid as normal vision.	Clear and reasonably vivid.	Moderately clear and vivid.	Vague and dim.	No image at all, you only know you are thinking about it.

2. The trolley ride to the operating theatre?



☐	☐	☐	☐	☐
Perfectly clear and as vivid as normal vision.	Clear and reasonably vivid.	Moderately clear and vivid.	Vague and dim.	No image at all, you only know you are thinking about it.

3. The operating theatre?

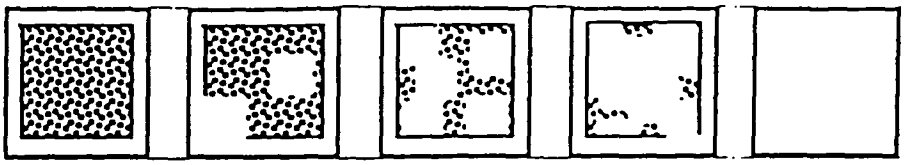


☐	☐	☐	☐	☐
Perfectly clear and as vivid as normal vision.	Clear and reasonably vivid.	Moderately clear and vivid.	Vague and dim.	No image at all, you only know you are thinking about it.

A4: Visual Imagery Scale- Experiment 2 (Friends)

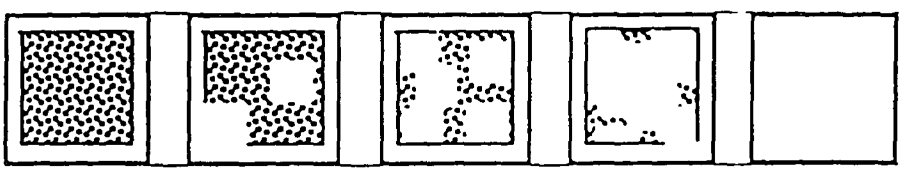
How Vividly Did You Imagine?
No Friends Scene

1. The playground at school?



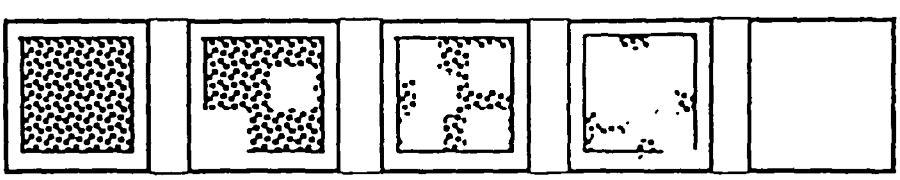
Perfectly clear and as vivid as normal vision.	Clear and reasonably vivid.	Moderately clear and vivid.	Vague and dim.	No image at all, you only know you are thinking about it.

2 The other children talking and laughing?



Perfectly clear and as vivid as normal vision.	Clear and reasonably vivid.	Moderately clear and vivid.	Vague and dim.	No image at all, you only know you are thinking about it.

3. The children sitting next to you?

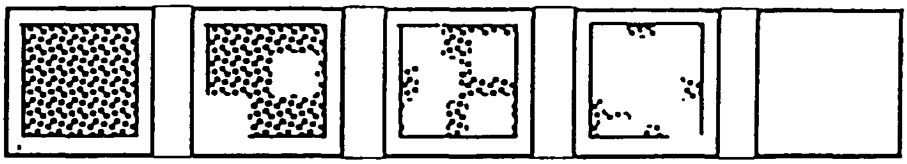


Perfectly clear and as vivid as normal vision.	Clear and reasonably vivid.	Moderately clear and vivid.	Vague and dim.	No image at all, you only know you are thinking about it.

A5: Visual Imagery Scale- Experiment 2 (Shark)

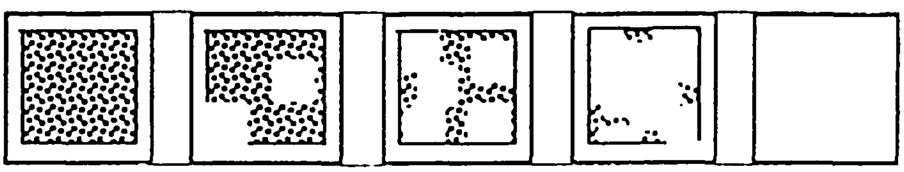
How Vividly Did You Imagine?
The Shark Scene

1. Your favourite beach?



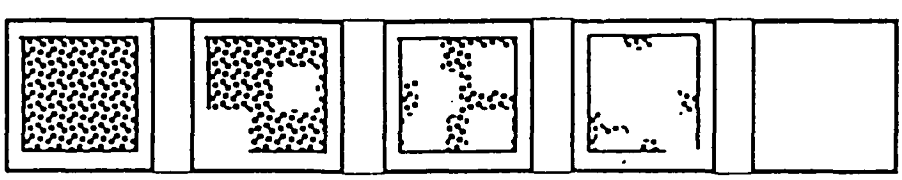
Perfectly clear and as vivid as normal vision.	Clear and reasonably vivid.	Moderately clear and vivid.	Vague and dim.	No image at all, you only know you are thinking about it.

2. Being out in the water?



Perfectly clear and as vivid as normal vision.	Clear and reasonably vivid.	Moderately clear and vivid.	Vague and dim.	No image at all, you only know you are thinking about it.

3. The shark's fin?



Perfectly clear and as vivid as normal vision.	Clear and reasonably vivid.	Moderately clear and vivid.	Vague and dim.	No image at all, you only know you are thinking about it.

A6: Thoughts Checklist (Operation) Experiment 3

What Did You Think?

People think lots of different things while they are having an operation. Here are some things that people may or may not think. Read each sentence and decide whether you thought it while you were imagining having an operation. If you did think it, tick yes. If you did not think it, tick no. There are no right or wrong answers.

	YES	NO	SCALE
1. I'll try and pretend to be brave	❑	❑	C
2. I feel a lot more confident knowing that it will be over soon	❑	❑	P
3. I'm really worried about this	❑	❑	I
4. I can see the needle and it's big and pointy	❑	❑	X
5. I'll try and enjoy the time before I go in	❑	❑	C
6. I feel OK about this	❑	❑	P
7. Those lights are glaring right in my face and hurting my eyes	❑	❑	X
8. I just feel really weird	❑	❑	I
9. I'm feeling really nervous about this operation	❑	❑	I
10. Should I just start crying?	❑	❑	C
11. What if I wake up in the middle of the operation?	❑	❑	X
12. I feel alright at the moment	❑	❑	P
13. I don't believe a word that the nurse says	❑	❑	X
14. I don't feel scared	❑	❑	P
15. I will close my eyes while they put the needle in	❑	❑	C
16. My heart's beating really really fast	❑	❑	I
17. They are taking me closer and closer to where I might die	❑	❑	X
18. I'm getting more and more frightened	❑	❑	I
19. I may as well get this over and done with	❑	❑	C
20. I feel alright	❑	❑	P
21. Should I say I'm scared?	❑	❑	C
22. I feel sick in my stomach	❑	❑	I
23. They don't look very friendly	❑	❑	X
24. I'm feeling really really scared	❑	❑	I
25. What if it doesn't work?	❑	❑	X
26. I know I don't have to worry	❑	❑	P
27. Should I say how I feel?	❑	❑	C
28. I don't have to worry	❑	❑	P
29. I'm really terrified now	❑	❑	I
30. What if it all goes wrong?	❑	❑	X
31. I'm feeling quite calm really	❑	❑	P
32. I've got butterflies in my stomach	❑	❑	I
33. I'll try to think that this is just a dream	❑	❑	C
34. I'm really feeling quite relaxed about this	❑	❑	P
35. I'll try and close my eyes	❑	❑	C
36. It's going to really hurt	❑	❑	X
37. I'll try and think of something else while I lie here	❑	❑	C
38. I know I don't have to be nervous	❑	❑	P
39. I'm going cold all over	❑	❑	I
40. Everyone is staring at me	❑	❑	X

Note: P= Positive scale, C= Coping scale, X= external threat scale and I= internal threat scale

A7: Thoughts Checklist (Friends) Experiment 4

What Did You Think?

No Friends

People think lots of different things when they have no friends. Here are some things that people may or may not think. Read each sentence and decide whether you thought it while you were imagining having no friends. If you did think it, tick yes. If you did not think it, tick no. There are no right or wrong answers.

	YES	NO	SCALE
1. I've got butterflies in my stomach	❑	❑	T
2. I have made good friends near my home anyway	❑	❑	P
3. What am I going to do without any friends to do things with?	❑	❑	C
4. I'm really nervous	❑	❑	T
5. It's alright, I am good at making friends	❑	❑	P
6. I'm happier on my own anyway	❑	❑	P
7. I'd like to go somewhere else to eat my lunch	❑	❑	C
8. Nobody likes me	❑	❑	T
9. Everyone is staring at me	❑	❑	T
10. Maybe I should just walk around looking confident	❑	❑	C
11. I'll go and find a quiet place to sit down	❑	❑	C
12. I know I will make some friends soon	❑	❑	P
13. I feel good just sitting here listening to them	❑	❑	P
14. I'm so upset	❑	❑	T
15. I will just stay here until lunch is over	❑	❑	C
16. I don't want to eat my lunch at all	❑	❑	T
17. I am happy sitting on my own	❑	❑	P
18. I don't mind them ignoring me	❑	❑	P
19. What will I do when I finish my lunch?	❑	❑	C
20. I just want to go to the library or the computer room	❑	❑	C
21. I am happy sitting here	❑	❑	P
22. I am trying to see if there's someone who is my friend	❑	❑	C
23. It's OK, I can cope with this	❑	❑	P
24. I'll look around and see if there's anyone I know	❑	❑	C
25. None of the other kids like me	❑	❑	T
26. It's not fair, I have to sit here all by myself	❑	❑	T
27. I feel like I'm going to cry in a minute	❑	❑	T
28. I feel OK	❑	❑	P
29. I think I will go off and do something by myself	❑	❑	C
30. I'm scared that they might gang up on me	❑	❑	T

Note: P= Positive scale, C= Coping scale and T= threat scale

A8: Thoughts Checklist (Operation) Experiment 4

What Did You Think?

Operation

People think lots of different things while they are having an operation. Here are some things that people may or may not think. Read each sentence and decide whether you thought it while you were imagining having an operation. If you did think it, tick yes. If you did not think it, tick no. There are no right or wrong answers.

	YES	NO	SCALE
1. I'll try and close my eyes and pretend to be brave	❑	❑	C
11. I don't feel scared	❑	❑	P
12. I will close my eyes while they put the needle in	❑	❑	C
13. My heart's beating really really fast	❑	❑	T
2. I feel a lot more confident knowing that it will be over soon	❑	❑	P
3. I'm really worried about this	❑	❑	T
4. I can see the needle and it's big and pointy	❑	❑	T
5. I'll try and enjoy the time before I go in	❑	❑	C
6. I feel OK about this	❑	❑	P
7. I'm feeling really nervous about this operation	❑	❑	T
8. Should I just start crying?	❑	❑	C
9. What will I do if I wake up in the middle of the operation?	❑	❑	C
10. I feel alright at the moment	❑	❑	P
14. I'm getting more and more frightened	❑	❑	T
15. I may as well get this over and done with	❑	❑	C
16. I feel alright	❑	❑	P
17. Should I say I'm scared?	❑	❑	C
18. They don't look very friendly	❑	❑	T
19. What if it doesn't work?	❑	❑	T
20. I know I don't have to worry	❑	❑	P
21. Should I say how I feel?	❑	❑	C
22. I don't have to worry	❑	❑	P
23. I'm really terrified now	❑	❑	T
24. What if it all goes wrong?	❑	❑	T
25. I'm feeling quite calm really	❑	❑	P
26. I'm really feeling quite relaxed about this	❑	❑	P
27. I'll try and close my eyes	❑	❑	C
28. It's going to really hurt	❑	❑	T
29. I'll try and think of something else while I lie here	❑	❑	C
30. I know I don't have to be nervous	❑	❑	P

Note: P= Positive scale, C= Coping scale and T= threat scale

A9: Thoughts Checklist (Shark) Experiment 4

What Did You Think?

Shark

People think lots of different things when they see a shark. Here are some things that people may or may not think. Read each sentence and decide whether you thought it while you were imagining seeing that shark in the water. If you did think it, tick yes. If you did not think it, tick no. There are no right or wrong answers.

	YES	NO	SCALE
1. I should get someone's attention	❑	❑	C
2. No one knows that I'm out here	❑	❑	T
3. It's OK, I'm a good swimmer	❑	❑	P
4. What if it's a shark	❑	❑	T
5. What am I going to do?	❑	❑	C
6. I feel good swimming through the water so easily	❑	❑	P
7. It might come up and bite my leg off	❑	❑	T
8. I don't have to worry, I know what to do if it's a shark	❑	❑	P
9. If only I could do something so this thing would go away	❑	❑	C
10. I'm really really scared now	❑	❑	T
11. I've got to be careful it doesn't get me	❑	❑	C
12. I can feel my heart thumping really fast	❑	❑	T
13. It's OK, I am feeling relaxed	❑	❑	P
14. I feel terrified	❑	❑	T
15. I've got to get back in before it gets me	❑	❑	C
16. They tell me to stay calm when you see a shark	❑	❑	C
17. I've got to keep my eyes on it, watch it carefully	❑	❑	C
18. I feel OK about this	❑	❑	P
19. I am really excited, I haven't seen a shark before	❑	❑	P
20. I am feeling safe, it's not too far to the shore	❑	❑	P
21. I won't have any trouble swimming that far back to shore	❑	❑	P
22. What if it chomps me straight up	❑	❑	T
23. I'm trying to pretend that I am not there	❑	❑	C
24. I think its teeth would be really sharp	❑	❑	T
25. I am a great swimmer, I will be OK	❑	❑	P
26. I'm trying to swim faster and faster away from it.	❑	❑	C
27. I have to swim as fast as I can	❑	❑	C
28. If I keep swimming it might get really angry	❑	❑	T
29. I am so scared	❑	❑	T
30. I feel great swimming out here	❑	❑	P

Note: P= Positive scale, C= Coping scale and T= threat scale

Appendix B: Instructions to Participants (Including Scenarios)

B1: Administration Instructions: Experiment 1

Today we are going to look at some things that make some people scared. I am going to give you a list of these things and I want you to look at them think about whether they scare you. First, write your name along the top line. Next write down how old you are. Finally write down the school you go to, which is........................ Now tick the box saying if you are male or female. Now we will read the first bit together:

Below are written a list of things that make some people scared. Read each one carefully and tick the box in front of the words that best describe how scared you are. There are no right or wrong answers. Remember, find the words that best describe how scared you are.

Lets try one first (Have this example written on the board). Teddy bears/sausage rolls...., now, are you not scared, scared or very scared of teddy bears/sausage rolls? If you are not scared of teddy bears/sausage rolls, you would tick this box, if you were scared, then you would tick this box, and, if you were very scared, you would tick this box. Does everyone understand how to do it? Are there any questions?

FOR GRADE 7 & 10: Work on your own. If there are any words that you don't know, or you have any questions, put your hand up and I will come and help you. You can start now.

FOR GRADE 3, 4 &5: Now, I will read aloud each one of the questions, and as I read them I want you to decide how you feel about it and tick the right box. Work on your own, I want to know how you feel about it. If you're not sure, try to answer as well as you can. If you have any questions, put up your hand.

Administer FSSC and collect completed forms.

STAI/C: Now we are going to do another one. This one is all about how you feel. First of all, write your name and age at the top of the page, and then the date today. The date today is...... Read along with me while I read out the directions:

A number of statements which boys and girls use to describe themselves are given below. Read each statement, and decide if it is hardly ever, or sometimes, or often true for you. Then for each statement, put an X in the box in front of the word that seems to describe you best. There are no right or wrong answers. Do not spend too much time on any one statement. Remember, choose the word which seems to describe how you usually feel.

Lets try one on the board. I eat all of my dinner/do all my home work..... Now if you eat all of your dinner/do all your homework hardly ever, you would put an x in this box, if you eat all of you dinner/do all your homework sometimes, you would put an x in this box, and if you eat all of your dinner/do all your homework often, you would put an x in this box. Remember to place an x in front of the statement which best describes how you feel, either hardly ever, sometimes or often. Does everyone understand? Are there any questions?

FOR GRADE 7 & 10: Work on your own, I want to know how you feel about it. If there are any words that you don't know, or you have any questions, put your hand up and I will come and help you. You can start now.

FOR GRADE 3,4 & 5: Now, I will read aloud each one of the questions, and as I read them I want you to decide how you feel about it and tick the right box. Work on your own, I want to know how you feel about it. If you're not sure, try to answer as well as you can. If you have any questions, put up your hand.

Administer STAI- Trait and collect completed forms.

Discussion on fears may then begin as a follow up to the session.

B2: Administration Instructions: Experiment 2

First administer:
STAI (Trait)
Mod FSSC-R
RCMAS

Today we are going to do some imagination work. I am going to ask you to imagine a situation very clearly in your mind, and then I am going to ask you to tell me all the things that come into your mind while you are imagining the situation. Do you know what I mean when I ask you about the things that come into your mind? Just imagine I could climb into your head and hear all the things that you say to yourself. They could be about yourself and how you are feeling, or about what you are imagining, or about things that have happened to you before, all sorts of things. The main part of this is that I want you to say out loud as many things as you can that pop into your mind, even if they don't seem to be important. While you are saying them, I am going to record what you say on my tape recorder so that I don't forget. First I will record your name and school, so that I know who this is when I play it back.

You know when you read cartoons, and the characters have the thought bubbles above their heads? Like this? I want you to tell me the things that are happening in your thought bubble. Lets have a practice. Sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as you can, as if you were actually there.

Imagine it is your birthday. You have just woken up in bed and you realise that it is your birthday. Really put yourself there in your bed, all nice and cosy, thinking about your birthday. Can you see it? You are feeling very excited as you think about the presents that you will get. You are feeling very happy and excited. Look around you and see what your room looks like. Really put yourself there. Without opening your eyes, keep imagining the situation and say out loud what is going through your mind as you are lying there in bed on your birthday.

If child has trouble: Lets try it with me imagining. I want you to ask me to imagine my birthday, and I will tell you all the things that come into my mind as I imagine it.

(Now you have another go.) Think of what it is like lying there in your bed. It's still early and you know that no one else is awake, so you can't get up yet, you just have to lie in bed for a while. You are feeling very excited, and thinking about all the presents you might get. You are feeling very happy because it is your birthday. Really see yourself there. Without opening your eyes, keep imagining the situation and say out loud what is going through your mind as you are lying there in bed on your birthday.

Keep going until the child is verbalising fluently.

Well done, that's great, you have the idea now. Do you have any questions about what to do? Are you sure you have the idea? OK now you have the idea of it I want you to do some more imagining for me. These ones will be a bit longer, so I want you to concentrate really hard and tell me all the things that run through you mind while you are imagining them. will stop you a few times through them, so make sure you keep imagining until I tell you to stop. Remember that the main part of this is that I want you to say as many things as you can that pop into your mind, even if they don't seem to be important.

Having No Friends

Prelude:
1. Do you have lots of friends at school?
2. Can you imagine a time when you didn't?

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Part 1
It's lunch time at school and you are going outside to eat your lunch. Really see yourself walking outside to eat your lunch. Can you see yourself there? You know that there will be no one to have lunch with because you don't have any friends. You are feeling a bit **sick in the stomach** because you hate to go out and sit by yourself in the playground with no friends. You are **feeling nervous**. Look around you and see where you are walking. Really see yourself there walking outside to have your lunch, walking outside, **feeling upset**. You are standing outside now, **feeling afraid**, looking around at everyone else who is laughing and talking with their friends. Your **hands are starting to feel sweaty**, because you know that you will have to sit down by yourself outside. You **feel like crying**. See the other kids there, running around, laughing and talking. Really put yourself there.

Without opening your eyes, keep imagining the situation and say out loud what is going trough your mind as you are standing there watching the other kids with their friends.
What else is going through your mind? (if only 1 or 2 responses)

Part 2
You go over to where there are a group of others sitting. Can you see yourself there? Really see the playground and look at where you are walking to. You are **feeling nervous**. Look around you and see the other kids talking and laughing, having fun together. You are feeling **sick in the stomach**, and you sit yourself down and open your lunch. You don't feel like having your lunch. You are feeling a bit **upset** and your **hands are feeling sweaty**. Really imagine yourself there, sitting all by yourself looking down at your lunch. You can see all the other children playing and eating their lunch. You can hear them laughing and talking, sounding really happy. You are feeling like you are **going to cry**, and

you feel **very worried**. Look around you and see what is happening around you, hear the other kids playing, laughing and having fun.

Without opening your eyes, keep imagining the situation and say out loud what is going through your mind as you sit there by yourself in the playground.
What else is going through your mind? (if only 1 or 2 responses)

Part 3
You are sitting there all by yourself with no friends, starting to eat your lunch. Can you see yourself there? Some other kids come and sit down near you. There are 3 of them sitting next to you, they are all in your class. Really see them there, talking to each other and laughing and ignoring you. Your **hands are feeling sweaty**. See them there ignoring you really see them there, really see their faces. You can feel yourself getting **nervous**, and you feel **sick in the stomach**. You are feeling like you **want to cry**. Really put yourself there. One of them looks up at you, and says "What are you looking at?" Really hear him/her saying that. Listen to his/her voice. As they say that you can feel your **heart start to beat faster**. You are feeling really **scared** now, and very **upset**. Really imagine yourself there, sitting there, trying to eat you lunch with that girl/boy saying that to you.

Without opening your eyes, keep imagining the situation and say out loud what is going through your mind as you are sitting there with the other kids ignoring you.
What else is going through your mind? (if only 1 or 2 responses)

Part 4
As you sit there, a boy/girl from your class comes over and sits down. "Where were you? We were looking for you. We need someone else on our team." Can you see yourself there? You are feeling much happier now, knowing that there are some people who want to do things with you, it's just that today they weren't around when you came out to have your lunch. The boy/girl looks at you and you can see there is a bit of a smile on his/her face. You are feeling much better now, your stomach is suddenly feeling much better and you notice you don't feel sick any more, but hungry. Really see yourself there, you are sitting there, and all of a sudden you feel a lot more like eating your lunch. You notice that the sun has come out. It really isn't that bad. You are feeling much better, and you start to eat your lunch as you talk to this boy/girl.

Well done, that was great. Now, just before we talk about it, I have some questions for you to answer. First of all I want to find out how clearly or vividly you imagined the scene that you just imagined.
(Give imagery assessment).

Now, listen carefully while I give you the instructions for the next questionnaire.

A number of statements which boys and girls use to describe themselves are given below. Read each statement carefully and decide how you felt while you were in the middle of the imagination activity, before the kid from your class came over to talk to you. Then put an x in the box right in front of the word or phrase which best describes how you felt. There are no right or wrong answers. Do not spend too much time on any one statement. Remember find the word or phrase which best describes how you felt while we were in the middle of the imagination activity, before the kid from your class came over to talk to you.

Now listen carefully and I will read through the statements. Read through STAI state, or leave for them to read.

Debrief

1. You felt a bit upset when you were imagining that scene, how do you feel now that it is over and you know it is not real?
2. Has that ever happened to you?
3. Do you feel sad thinking about it?
4. What do you think you could do if you were feeling like that about your friends?

Having an Operation

Prelude

1. Have you ever had an operation or been to hospital?
2. What was it for?
3. Were you scared?
4. If you did go to hospital, who would go with you?

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Part 1

Imagine you are in a hospital bed waiting to have an operation to have your appendix taken out. Really see yourself there. Can you see it? Really imagine what it is like, you are feeling **very worried**, look around you and see the hospital room. You can feel your **heart beating fast**. Really imagine yourself there. See the bed there that you are lying in, it has white stiff sheets and cotton blankets. You can smell the antiseptic smell of the hospital all around you, really smell it. You are feeling **sick in the stomach**, and **nervous** because you know you are about to have your appendix out. You are feeling **very frightened** and can feel that your **palms are sweaty**. Really put yourself there in the hospital bed waiting to have the operation.

Without opening your eyes, keep imagining the situation and say out loud what is going through your mind as you lie there in the hospital bed.
What else is going through your mind? (if only 1 or 2 responses)

Part 2

You are lying in a hospital bed waiting to have an operation to have your appendix taken out. Really see yourself there. Can you see it? You are feeling **very nervous**. As you lie there you can see a nurse coming into your room. She is telling you that the doctor is ready for you to come in to have your operation.

You feel **sick in the stomach** and **very afraid** as she says that. Look up and you can see the man coming with the trolley for you to go to the operating theatre, and you feel your **heart start to beat faster**. They are telling you that it will be OK, that it will all be over very soon. You climb up onto the trolley and lie down, and you are wheeled out of your room and down the hall. Really imagine yourself there, being wheeled down the hall to the operating theatre. You are feeling **very frightened** as they wheel you along, and you **feel like crying**.

Without opening your eyes, keep imagining the situation and say out loud what is going through your mind as you lie there on the trolley.
What else is going through your mind? (if only 1 or 2 responses)

Part 3
Really see yourself lying there on the trolley as they wheel you into the operating theatre, you are feeling **really nervous** and have very **sweaty palms**. Can you see it? You can see all the machines and lights around you and all the doctors and nurses have green masks over their faces, and you feel **scared**. Really imagine them there, the nurses and doctors with their masks on. Your doctor is there and so is another man, the anaesthetist, who is going to give you a needle in your arm. Really imagine him there, telling you that you will just feel a little prick in your arm, and then you will go to sleep. You can feel your **heart beat faster** as he says that. Really see him there. He holding a big needle and is going to put it in your arm. Feel the way that the nurse straps your arm, and wipes it with cold alcohol, so that the doctor can give you a needle. Really put yourself there, lying there on the operating table. You are feeling **terrified** and **sick in the stomach**.

Without opening your eyes, keep imagining the situation and say out loud what is going through your mind as you lie there on the operating table before you have the needle.
What else is going through your mind? (if only 1 or 2 responses)

Part 4
The doctor has given you a needle and next thing you know you are waking up back in your hospital room. Can you see yourself there? You are feeling a bit funny, but you open your eyes, and see your (insert parent) looking down at you and smiling. (Parent) is there for you as you wake up, and he/she has a big box of chocolates for you. Really put yourself there, lying in bed, feeling a bit funny and sleepy, looking up at your (parent), as he/she smiles down at you. You feel very safe and happy, knowing that you are OK and that your (parent) is there waiting for you to wake up. You know that when you feel a bit better, you can get up and have the chocolate. You are feeling much better and happier. Really see yourself there, lying in the hospital bed feeling very sleepy.

Well done, that was great. Now, just before we talk about it, I have some questions for you to answer. First of all I want to find out how clearly or vividly you imagined the scene that you just imagined.
(Give imagery assessment).

Now, listen carefully while I give you the instructions for the next questionnaire As for previous).

Debrief
1. You felt a bit upset when you were imagining that scene, how do you feel now that it is over and you know it is not real?
2. One thing about that scene that you imagined was that your mum/dad wasn't there in the beginning, do you think that would really happen?
3. What would you do if you were feeling scared about going to hospital or having an operation or something like that?

Sharks

Prelude
1. Are you a good swimmer?
2. Do you go to the beach much in the summer?
3. Do you get scared if you are out too far?
4. Has anything bad ever happened while you are swimming?
5. Have you ever seen a shark?

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Part 1
Imagine yourself at the beach and on a lovely day. Really see yourself there on your favourite beach. Can you picture it? Really imagine the beach there. You decide to go for a swim out into the water. Feel the water against your skin. Really imagine yourself swimming out into the water. Even if you are not very good at swimming, on this day you can swim very well. Really put yourself there, swimming out into the water. All of a sudden you realise that you are out too far, and **feel scared**. Really imagine yourself there, out too deep in the water, and you have a **funny feeling in your stomach,** because you are scared. Look around you and you can a dark shadow in the water. You feel your **heart start to beat fast**, and you feel **nervous**, because you are too far out and you can see a dark shadow moving in the water. The sun is still shining and you are out there in the water, a long way out, feeling **very afraid**, and **sick in the stomach**. Really imagine yourself there, out in the water.

Without opening your eyes, keep imagining the situation and say out loud what is going through your mind as you are swimming out there in the water, seeing the dark shadow.
What else is going through your mind? (if only 1 or 2 responses)

Part 2
You are out there in the water, and you can see a dark shadow in the water. Can you see it? You are feeling **sick in your stomach**, and it's **hard you get your breath** because you are feeling so **nervous**. Really put yourself there, out in the water. You are treading water, and you see the shadow moving around you in the water, and then it comes up to the surface and you see a grey fin. Really put yourself there, feeling **very scared**. You are out there in the water, all alone and

you can see a grey fin slowly circling you. You are trying to swim back, but you are very far out, and you're not getting very far. Look down through the water, and you can see the sand, it is not too deep, but you feel **very frightened**. You **feel like crying** because of the fin that you can see. Look and see the fin, watch it as it circles you.

Without opening your eyes, keep imagining the situation and say out loud what you are thinking as you are out there in the water, watching the grey fin.
What else is going through your mind? (if only 1 or 2 responses)

Part 3
Really imagine you are out there in the water, away from the shore trying to swim in, and there is a grey fin, circling you. It looks like a shark. Can you see it? You are out there in the water alone, **feeling terrified**, and then it disappears, so that all you can see is a dark shadow under the water. It is swimming slowly around you now, and you **feel more frightened**, as you see it gradually moving closer to you. You can't take your eyes off it, and you see the fin rising to the surface again. The closer it gets the **faster your heart beats.** Really see it there, the dark grey of the fin moving towards you slowly, slowly. You feel **sick in the stomach**, and you feel **all jittery inside**. Imagine what it is like, all alone out there in the water trying to swim in to shore with a shark circling you. It is getting slowly closer and closer to you, look and see its fin coming out of the water. It's about 10 metres away now and you are feeling **very afraid**. Really imagine yourself there.

Without opening your eyes, keep imagining the situation and say out loud what is going through your mind as you watch the shark come closer.
What else is going through your mind? (if only 1 or 2 responses)

Part 4
You are out there in the water all alone, and there is the fin sticking up out of the water. Really see yourself there, out in the water. You can see the fin sticking up, and it is coming closer. All of a sudden you look more closely and the head comes up out of the water, look at the head and see that it is not a shark, but a dolphin! It is the smiling face of a dolphin there in front of you. Really see her there. She sticks her face up, and smiles at you, and makes that lovely noise that dolphins make. Really see her there. You are feeling much happier now because you know that you are safe. Really see as she jumps out of the water and plays around you, diving and jumping, showing off just for you. You are feeling great now, knowing that you are safe. The sun is shining and you can't wait to get back to the shore and tell you friends about it. You feel great!

Well done, that was great. Now, just before we talk about it, I have some questions for you to answer. First of all I want to find out how clearly or vividly you imagined the scene that you just imagined.
(Give imagery assessment).

Now, listen carefully while I give you the instructions for the next questionnaire (as for previous).

Debrief

1. You felt a bit upset when you were imagining that scene, how do you feel now that it is over and you know it is not real?
2. Do you think that could happen at your favourite beach?
3. How would you make sure that it didn't happen?

B3: Administration Instructions: Experiment 3

Having an Operation

1. Internal Threat Cognitions

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Imagine you are in a hospital bed waiting to have an operation. Really see yourself there. Can you see it? Really imagine what it is like, look around you and see the hospital room. **You are thinking, I'm really really worried about this.** Really imagine yourself there. See the bed there that you are lying in, it has stiff white sheets and cotton blankets. **You are thinking to yourself, I've got butterflies in my stomach.** You can smell the antiseptic smell of the hospital all around you, really smell it. Really put yourself there in the hospital bed waiting to have the operation. **As you lie there, you are thinking, I'm feeling really nervous about this operation, my heart's beating really really fast.** Really see yourself there lying in the hospital bed waiting to have this operation. Can you see it? As you lie there you can see a nurse coming into your room. She is telling you that the doctor is ready for you to come in to have your operation. **As she says that you think to yourself, I'm feeling really really scared.** Look up and you can see the man coming with the trolley for you to go to the operating theatre. They are telling you that it will be OK, that it will all be over very soon. **But you are thinking I'm getting more and more frightened, and I feel sick in my stomach.** You climb up onto the trolley and lie down, and you are wheeled out of your room and down the hall. Really imagine yourself there, being wheeled down the hall to the operating theatre. Really see yourself lying there on the trolley as they wheel you into the operating theatre. Can you see it? **As you lie there, you are thinking to yourself, I just feel really weird.** You can see all the machines and lights around you and all the doctors and nurses have green masks over their faces. Really imagine them there, the nurses and doctors with their masks on. Your doctor is there and so is another man, the anaesthetist, who is going to give you a needle in your arm. Really imagine him there, telling you that you will just feel a little prick in your arm, and then you will go to sleep. **And you are thinking I'm really terrified now, and I'm going cold all over.** Really see him there. He's holding a big needle and is going to put it in your arm. Really put yourself there, lying there on the operating table.

The doctor has given you a needle and next thing you know you are waking up back in your hospital room. Can you see yourself there? You are feeling a bit funny, but you open your eyes, and see your mum or dad looking down at you and smiling. They are there for you as you wake up, and have a big box of chocolates for you. Really put yourself there, lying in bed, feeling a bit funny and sleepy. You feel very safe and happy, knowing that you are OK and that your mum or dad is there waiting for you to wake up. You know that when you feel a bit better, you can get up and have the chocolate. You are feeling much better and happier. Really see yourself there, lying in the hospital bed feeling very sleepy.

2. External Threat Cognitions
OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Imagine you are in a hospital bed waiting to have an operation. Really see yourself there. Can you see it? Really imagine what it is like, look around you and see the hospital room. **You are thinking, everyone is staring at me**. Really imagine yourself there. See the bed there that you are lying in, it has stiff white sheets and cotton blankets. **You are thinking to yourself, it's going to really really hurt.** You can smell the antiseptic smell of the hospital all around you, really smell it. Really put yourself there in the hospital bed waiting to have the operation. **As you lie there, you are thinking, what if it all goes wrong?** Really see yourself there lying in the hospital bed waiting to have this operation. Can you see it? As you lie there you can see a nurse coming into your room. She is telling you that the doctor is ready for you to come in to have your operation. **As she says that you think to yourself, what if I wake up in the middle of the operation?** Look up and you can see the man coming with the trolley for you to go to the operating theatre. They are telling you that it will be OK, that it will all be over very soon. **But you are thinking I don't believe a word that she says.** You climb up onto the trolley and lie down, and you are wheeled out of your room and down the hall. Really imagine yourself there, being wheeled down the hall to the operating theatre. Really see yourself lying there on the trolley as they wheel you into the operating theatre. Can you see it? **As you lie there, you are thinking to yourself, they are taking me closer and closer to where I might die.** You can see all the machines and lights around you and all the doctors and nurses have green masks over their faces. **And you are thinking, they don't look very friendly, and those lights are glaring right in my face and hurting my eyes.** Really imagine them there, the nurses and doctors with their masks on. Your doctor is there and so is another man, the anaesthetist, who is going to give you a needle in your arm. Really imagine him there, telling you that you will just feel a little prick in your arm, and then you will go to sleep. **And you are thinking I can see the needle and it's big and pointy. What if it doesn't work and I wake up in the middle of the operation?** Really see him there. He's holding a big needle and is going to put it in your arm. Really put yourself there, lying there on the operating table.

The doctor has given you a needle and next thing you know you are waking up back in your hospital room. Can you see yourself there? You are feeling a bit funny, but you open your eyes, and see your mum or dad looking down at you and smiling. They are there for you as you wake up, and have a big box of chocolates for you. Really put yourself there, lying in bed, feeling a bit funny and sleepy. You feel very safe and happy, knowing that you are OK and that your mum or dad is there waiting for you to wake up. You know that when you feel a bit better, you can get up and have the chocolate. You are feeling much better and happier. Really see yourself there, lying in the hospital bed feeling very sleepy.

3. Positive Self Statements

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Imagine you are in a hospital bed waiting to have an operation. Really see yourself there. Can you see it? Really imagine what it is like, look around you and see the hospital room. **You are thinking, I'm really feeling quite relaxed about this**. Really imagine yourself there. See the bed there that you are lying in, it has stiff white sheets and cotton blankets. **You are thinking to yourself, I know I don't have to worry, or be nervous.** You can smell the antiseptic smell of the hospital all around you, really smell it. Really put yourself there in the hospital bed waiting to have the operation. **As you lie there, you are thinking, I feel alright at the moment.** Really see yourself there lying in the hospital bed waiting to have this operation. Can you see it? As you lie there you can see a nurse coming into your room. She is telling you that the doctor is ready for you to come in to have your operation. **As she says that you think to yourself, I don't feel scared.** Look up and you can see the man coming with the trolley for you to go to the operating theatre. They are telling you that it will be OK, that it will all be over very soon. **And you are thinking I feel a lot more confident knowing that, I don't have to worry.** You climb up onto the trolley and lie down, and you are wheeled out of your room and down the hall. Really imagine yourself there, being wheeled down the hall to the operating theatre. Really see yourself lying there on the trolley as they wheel you into the operating theatre. Can you see it? **As you lie there, you are thinking to yourself, I feel alright, I'm feeling quite calm really.** You can see all the machines and lights around you and all the doctors and nurses have green masks over their faces. Really imagine them there, the nurses and doctors with their masks on. Your doctor is there and so is another man, the anaesthetist, who is going to give you a needle in your arm. Really imagine him there, telling you that you will just feel a little prick in your arm, and then you will go to sleep. **And you are thinking I feel OK about this.** Really see him there. He's holding a big needle and is going to put it in your arm. Really put yourself there, lying there on the operating table.

The doctor has given you a needle and next thing you know you are waking up back in your hospital room. Can you see yourself there? You are feeling a bit funny, but you open your eyes, and see your mum or dad looking down at you and smiling. They are there for you as you wake up, and have a big box of chocolates for you. Really put yourself there, lying in bed, feeling a bit funny and sleepy. You feel very safe and happy, knowing that you are OK and that your mum or dad is there waiting for you to wake up. You know that when you feel a bit better, you can get up and have the chocolate. You are feeling much better and happier. Really see yourself there, lying in the hospital bed feeling very sleepy.

4. Coping Self Statements

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Imagine you are in a hospital bed waiting to have an operation. Really see yourself there. Can you see it? Really imagine what it is like, look around you and see the hospital room. **You are thinking, I'll try and think of something else while I lie here**. Really imagine yourself there. See the bed there that you are lying in, it has stiff white sheets and cotton blankets. **You are thinking to yourself, I'll try and enjoy the time before I go in.** You can smell the antiseptic smell of the hospital all around you, really smell it. Really put yourself there in the hospital bed waiting to have the operation. **As you lie there, you are thinking, I may as well get this over and done with.** Really see yourself there lying in the hospital bed waiting to have this operation. Can you see it? As you lie there you can see a nurse coming into your room. She is telling you that the doctor is ready for you to come in to have your operation. **As she says that you think to yourself, Should I say how I feel, say I'm scared, or should I just start crying?** Look up and you can see the man coming with the trolley for you to go to the operating theatre. They are telling you that it will be OK, that it will all be over very soon. **And you are thinking I'll try and close my eyes and pretend to be brave.** You climb up onto the trolley and lie down, and you are wheeled out of your room and down the hall. Really imagine yourself there, being wheeled down the hall to the operating theatre. Really see yourself lying there on the trolley as they wheel you into the operating theatre. Can you see it? **As you lie there, you are thinking to yourself, this is just a dream.** You can see all the machines and lights around you and all the doctors and nurses have green masks over their faces. Really imagine them there, the nurses and doctors with their masks on. Your doctor is there and so is another man, the anaesthetist, who is going to give you a needle in your arm. Really imagine him there, telling you that you will just feel a little prick in your arm, and then you will go to sleep. **And you are thinking I will close my eyes while they put the needle in.** Really see him there. He's holding a big needle and is going to put it in your arm. Really put yourself there, lying there on the operating table.

The doctor has given you a needle and next thing you know you are waking up back in your hospital room. Can you see yourself there? You are feeling a bit funny, but you open your eyes, and see your mum or dad looking down at you and smiling. They are there for you as you wake up, and have a big box of chocolates for you. Really put yourself there, lying in bed, feeling a bit funny and sleepy. You feel very safe and happy, knowing that you are OK and that your mum or dad is there waiting for you to wake up. You know that when you feel a bit better, you can get up and have the chocolate. You are feeling much better and happier. Really see yourself there, lying in the hospital bed feeling very sleepy.

Neutral Scenario

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Imagine you are at home and you are about to go out for a walk along your street. Really see yourself there. Can you see it? Really imagine what it is like, look around you and see the inside of your house, near the front door. Really imagine yourself there. See the front door of your house, notice what it looks like. You can hear the sounds of your house around you, notice what sounds there are. Really put yourself there at your front door waiting to go for a walk down your street. Really see yourself opening the front door. Look outside and see what is there outside the front door of your house. Look outside and you can see that it is a sunny day. You know that it will be quite warm outside. You walk out the front door and into the street. Really imagine yourself there, walking out into your street. Really see what it looks like as you walk out into the street, look around you and notice what things look like. Can you see it? You are starting to walk down the street, look and see the trees and plants in the gardens. Look around you and see the other houses in your street. Can you see them? Really see yourself there. Really imagine yourself there, walking along your street. Look across the road at the house over there, really notice what it looks like. You can see there is a man in the front yard of the house over the road. Really see him there. He's doing something in his garden. Really put yourself there, walking along your street, watching the man in his garden.

B4: Administration Instructions: Experiment 4

Having No Friends

Prelude
1. Do you have lots of friends at school?
2. Can you imagine a time when you didn't?

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

1. Threat Cognitions
It's lunch time at school and you are going outside to eat your lunch. Really see yourself walking outside to eat your lunch. But you know that there won't be anyone to have lunch with because you don't have any friends. As you walk outside you are thinking to yourself **I've got butterflies in my stomach and I'm really nervous**. Look around you and see where you are walking. Really see yourself there walking outside to have your lunch. You are standing outside now, and you will have to sit down by yourself and you think to yourself **Nobody likes me.** See the other kids there, running around, laughing and talking. Really put yourself there. You go over to where there's a seat. Really see the playground and look at where you are walking to. You are thinking **Everyone is staring at me.** Look around you and see the other kids talking and laughing, having fun together. You don't feel like having your lunch. Really imagine yourself there, sitting by yourself looking down at your lunch. You are thinking to yourself **I'm so upset. I don't want to eat my lunch at all.** You can see all the other kids playing and eating their lunch. You can hear them laughing and talking, sounding really happy. You think **none of the other kids like me.** Look around you and see what is happening around you, hear the other kids playing, laughing and having fun. You think to yourself **It's not fair, I have to sit here all by myself.** You are sitting there all by yourself with no friends, starting to eat your lunch. Some other kids come and sit down near you. There are 3 of them sitting next to you, they are all in your class. Really see them there, talking to each other and laughing and ignoring you. See them there ignoring you really see them there, really see their faces. You are thinking to yourself **I feel like I'm going to cry in a minute.** Really put yourself there. One of them looks up at you, and says "What are you looking at?" Really hear him/her saying that. Listen to his/her voice. You think to yourself **I'm scared they might gang up on me.** Really imagine yourself there, sitting there, trying to eat you lunch with that girl/boy saying that to you.

2. Positive Statements
It's lunch time at school and you are going outside to eat your lunch. Really see yourself walking outside to eat your lunch. You know that there will be no one to have lunch with because you don't have any friends. You are thinking to yourself **I have made good friends near my home anyway.** Look around you and see where you are walking. Really see yourself there walking outside to have your

lunch. You are standing outside now, and you will have to sit down by yourself. You are think to yourself **It's alright, I am good at making friends.** See the other kids there, running around, laughing and talking. Really put yourself there. You go over to where there's a seat. Really see the playground and look at where you are walking to. You are thinking **I'm happier on my own anyway.** Look around you and see the other kids talking and laughing, having fun together. You don't feel like having your lunch. Really imagine yourself there, sitting by yourself looking down at your lunch. You are thinking to yourself **I know I will make some friends soon.** You can see all the other kids playing and eating their lunch. You can hear them laughing and talking, sounding really happy. You think **I feel good just sitting here listening to them.** Look around you and see what is happening around you, hear the other kids playing, laughing and having fun. You think to yourself **I am happy sitting on my own.** You are sitting there all by yourself with no friends, starting to eat your lunch. Some other kids come and sit down near you. There are 3 of them sitting next to you, they are all in your class. Really see them there, talking to each other and laughing and ignoring you. See them there ignoring you really see them there, really see their faces. You are thinking to yourself **I don't mind them ignoring me, I am happy sitting here.** Really put yourself there. One of them looks up at you, and says "What are you looking at?" Really hear him/her saying that. Listen to his/her voice. You think to yourself **It's OK, I can cope with this.** Really imagine yourself there, sitting there, trying to eat you lunch with that girl/boy saying that to you, and you are thinking **I feel OK.**

3. Coping Statements

It's lunch time at school and you are going outside to eat your lunch. Really see yourself walking outside to eat your lunch. You know that there will be no one to have lunch with because you don't have any friends. You are thinking to yourself **What am I going to do without any friends to do things with?.** Look around you and see where you are walking. Really see yourself there walking outside to have your lunch. You are standing outside now, and you will have to sit down by yourself. You are think to yourself **I'd like to go somewhere else to eat my lunch.** See the other kids there, running around, laughing and talking. Really put yourself there. You go over to where there's a seat. Really see the playground and look at where you are walking to. You are thinking **Maybe I should just walk around looking confident, or go and find a quiet place to sit down.** Look around you and see the other kids talking and laughing, having fun together. You don't feel like having your lunch. Really imagine yourself there, sitting by yourself looking down at your lunch. You are thinking to yourself **I will just stay here until lunch is over.** You can see all the other kids playing and eating their lunch. You can hear them laughing and talking, sounding really happy. You think **What will I do when I finish my lunch? I just want to go to the library or the computer room.** Look around you and see what is happening around you, hear the other kids playing, laughing and having fun. You think to yourself **I am trying to see if there's someone who is my friend, I'll look around and see if there's anyone I know.** You are sitting there all by yourself with no friends, starting to eat your lunch. Some other kids come and sit down near you. There are 3 of them sitting next to you, they are all in your class. Really see them there, talking to each other and laughing and ignoring you. See them there ignoring you really see them there, really see their faces. You are thinking to yourself **I**

think I will go off and do something by myself. Really put yourself there. One of them looks up at you, and says "What are you looking at?" Really hear him/her saying that. Listen to his/her voice. You think to yourself Really imagine yourself there, sitting there, trying to eat you lunch with that girl/boy saying that to you, and you are thinking

As you sit there, a boy/girl from your class comes over and sits down. "Where were you? We were looking for you. We need someone else on our team." Can you see yourself there? You are feeling much happier now, knowing that there are some people who want to do things with you, it's just that today they weren't around when you came out to have your lunch. The boy/girl looks at you and you can see there is a bit of a smile on his/her face. You are feeling much better now, your stomach is suddenly feeling much better and you notice you don't feel sick any more, but hungry. Really see yourself there, you are sitting there, and all of a sudden you feel a lot more like eating your lunch. You notice that the sun has come out. It really isn't that bad. You are feeling much better, and you start to eat your lunch as you talk to this boy/girl.

Debrief
1. You felt a bit upset when you were imagining that scene, how do you feel now that it is over and you know it is not real?
2. Has that ever happened to you?
3. Do you feel sad thinking about it?
4. What do you think you could do if you were feeling like that about your friends?

Having an Operation

Prelude
1. Have you ever had an operation or been to hospital?
2. What was it for?
3. Were you scared?
4. If you did go to hospital, who would go with you?

1. Threat Cognitions
OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Imagine you are in a hospital bed waiting to have an operation. Really see yourself there. Can you see it? Really imagine what it is like, look around you and see the hospital room. **You are thinking, I'm really worried about this.** Really imagine yourself there. See the bed there that you are lying in, it has stiff white sheets and cotton blankets. **You are thinking to yourself, it's going to really hurt.** You can smell the antiseptic smell of the hospital all around you, really smell it. Really put yourself there in the hospital bed waiting to have the operation. **I'm feeling really nervous about this operation, my heart's beating really fast.** See yourself there lying in the hospital bed waiting to have this operation. Can you see it? As you lie there you can see a nurse coming into your room. She is telling you that the doctor is ready for you to come in to have your operation. Look up and you can see the man coming with the trolley for you to go to the operating theatre. They are telling you that it will be OK, that it will all be over very soon. **But you are thinking I'm getting more and more frightened.** You climb up onto the trolley and lie down, and you are wheeled out of your room and down the hall. Really imagine yourself there, being wheeled down the hall to the operating theatre. Really see yourself lying there on the trolley as they wheel you into the operating theatre. Can you see it? **As you lie there, you are thinking to yourself, what if it all goes wrong?** You can see all the machines and lights around you and all the doctors and nurses have green masks over their faces. **And you are thinking, they don't look very friendly, and I'm really terrified now** Really imagine them there, the nurses and doctors with their masks on. Your doctor is there and so is another man, the anaesthetist, who is going to give you a needle in your arm. Really imagine him there, telling you that you will just feel a little prick in your arm, and then you will go to sleep. **And you are thinking I can see the needle and it's big and pointy. What if it doesn't work and I wake up in the middle of the operation?** Really see him there. He's holding a big needle and is going to put it in your arm. Really put yourself there, lying there on the operating table.

2. Positive Self Statements
OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Imagine you are in a hospital bed waiting to have an operation. Really see yourself there. Can you see it? Really imagine what it is like, look around you and see the hospital room. **You are thinking, I'm really feeling quite relaxed about this**. Really imagine yourself there. See the bed there that you are lying in, it has stiff white sheets and cotton blankets. **You are thinking to yourself, I know I don't have to worry, or be nervous.** You can smell the antiseptic smell of the hospital all around you, really smell it. Really put yourself there in the hospital bed waiting to have the operation. **As you lie there, you are thinking, I feel alright at the moment.** Really see yourself there lying in the hospital bed waiting to have this operation. Can you see it? As you lie there you can see a nurse coming into your room. She is telling you that the doctor is ready for you to come in to have your operation. **As she says that you think to yourself, I don't feel scared.** Look up and you can see the man coming with the trolley for you to go to the operating theatre. They are telling you that it will be OK, that it will all be over very soon. **And you are thinking I feel a lot more confident knowing that, I don't have to worry.** You climb up onto the trolley and lie down, and you are wheeled out of your room and down the hall. Really imagine yourself there, being wheeled down the hall to the operating theatre. Really see yourself lying there on the trolley as they wheel you into the operating theatre. Can you see it? **As you lie there, you are thinking to yourself, I feel alright, I'm feeling quite calm really.** You can see all the machines and lights around you and all the doctors and nurses have green masks over their faces. Really imagine them there, the nurses and doctors with their masks on. Your doctor is there and so is another man, the anaesthetist, who is going to give you a needle in your arm. Really imagine him there, telling you that you will just feel a little prick in your arm, and then you will go to sleep. **And you are thinking I feel OK about this.** Really see him there. He's holding a big needle and is going to put it in your arm. Really put yourself there, lying there on the operating table.

3. Coping Self Statements
OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Imagine you are in a hospital bed waiting to have an operation. Really see yourself there. Can you see it? Really imagine what it is like, look around you and see the hospital room. **You are thinking, I'll try and think of something else while I lie here**. Really imagine yourself there. See the bed there that you are lying in, it has stiff white sheets and cotton blankets. **You are thinking to yourself, I'll try and enjoy the time before I go in.** You can smell the antiseptic smell of the hospital all around you, really smell it. Really put yourself there in the hospital bed waiting to have the operation. **As you lie there, you are thinking, I may as well get this over and done with.** Really see yourself there lying in the hospital bed waiting to have this operation. Can you see it? As you lie there you can see a nurse coming into your room. She is telling you that the doctor is ready for you to come in to have your operation. **As she says that you think to yourself, Should I say how I feel, say I'm scared, or should I just start crying?** Look up and you can see the man coming with the trolley for you to go to the operating theatre. They are telling you that it will be OK, that it will all be over very soon. **And you are thinking I'll try and close my eyes and pretend to be brave.** You climb up onto the trolley and lie down, and you are wheeled out of your room and down the hall. Really imagine yourself there, being wheeled down the hall to the operating theatre. Really see yourself lying there on the trolley as they wheel you into the operating theatre. Can you see it? **As you lie there, you are thinking to yourself, this is just a dream.** You can see all the machines and lights around you and all the doctors and nurses have green masks over their faces. Really imagine them there, the nurses and doctors with their masks on. Your doctor is there and so is another man, the anaesthetist, who is going to give you a needle in your arm. Really imagine him there, telling you that you will just feel a little prick in your arm, and then you will go to sleep. **And you are thinking I will close my eyes while they put the needle in.** Really see him there. He's holding a big needle and is going to put it in your arm. Really put yourself there, lying there on the operating table.

The doctor has given you a needle and next thing you know you are waking up back in your hospital room. Can you see yourself there? You are feeling a bit funny, but you open your eyes, and see your mum or dad looking down at you and smiling. They are there for you as you wake up, and have a big box of chocolates for you. Really put yourself there, lying in bed, feeling a bit funny and sleepy. You feel very safe and happy, knowing that you are OK and that your mum or dad is there waiting for you to wake up. You know that when you feel a bit better, you can get up and have the chocolate. You are feeling much better and happier. Really see yourself there, lying in the hospital bed feeling very sleepy.

Debrief:

1. You felt a bit upset when you were imagining that scene, how do you feel now that it is over and you know it is not real?
2. One thing about that scene that you imagined was that your mum/dad wasn't there in the beginning, do you think that would really happen?
3. What would you do if you were feeling scared about going to hospital or having an operation or something like that?

Sharks

Prelude

1. Are you a good swimmer?
2. Do you go to the beach much in the summer?
3. Do you get scared if you are out too far?
4. Has anything bad ever happened while you are swimming?
5. Have you ever seen a shark?

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

1. Threat Statements

Imagine yourself at the beach and on a lovely day. Really see yourself there on your favourite beach. Really imagine the beach there. You decide to go for a swim out into the water. Feel the water against your skin as you get in. Really imagine yourself swimming out into the water. Even if you are not very good at swimming, on this day you can swim really well. Really put yourself there, swimming out into the water. All of a sudden you realise that you are out too far, and you think **'no one knows that I'm out here'**. Really imagine yourself there, out too deep in the water. Look around you and you can a dark shadow in the water. You think to yourself **'What if it's a shark, it might come up and bite my leg off.'** You are too far out and you can see a dark shadow moving in the water. You think to yourself **'I'm really really scared now, I can feel my heart thumping really fast.'** The sun is still shining and you are out there in the water, a long way out. Really imagine yourself there, out in the water. You are out there in the water, and you can see a dark shadow in the water. Really put yourself there, out in the water. You are treading water, and you see the shadow moving around you in the water, and then it comes up to the surface and you see a grey fin. You think to yourself **'I feel terrified!'** You are out there in the water, all alone and you can see a grey fin slowly circling you. You are trying to swim back. Look down through the water, and you can see the sand, it is not too deep. Look and see the fin, watch it as it circles you. You think to yourself **'What if it chomps me straight up, I think its teeth would be really sharp!'.** Really imagine you are out there in the water, away from the shore trying to swim in, and there is a grey fin, circling you. It looks like a shark. You are out there in the water alone, and then it disappears, so that all you can see is a dark shadow under the water. It is swimming slowly around you now, see it gradually moving closer to you. You are thinking to yourself **'If I keep swimming it might get really angry'** You don't take your eyes off it, and you see the fin rising to the surface again. Really see it there, the dark grey of the fin moving towards you slowly, slowly. Imagine what it is like, all alone out there in the water trying to swim in to shore with a shark circling you. You are thinking **'I am so scared'**. It is getting slowly closer and closer to you, look and see its fin coming out of the water. Really imagine yourself there.

2. Positive Statements

Imagine yourself at the beach and on a lovely day. Really see yourself there on your favourite beach. Really imagine the beach there. You decide to go for a swim out into the water. Feel the water against your skin as you get in. Really imagine yourself swimming out into the water. Even if you are not very good at swimming, on this day you can swim really well. Really put yourself there, swimming out into the water. All of a sudden you realise that you are out too far, and you think **'It's OK, I'm a good swimmer, I feel good swimming through the water so easily'**. Really imagine yourself there, out too deep in the water. Look around you and you can a dark shadow in the water. You are thinking to yourself **'I don't have to worry, I know what to do if it's a shark'** You are too far out and you can see a dark shadow moving in the water. You think to yourself **'It's OK, I am feeling relaxed. I feel OK about this'** The sun is still shining and you are out there in the water, a long way out. Really imagine yourself there, out in the water. You are out there in the water, and you can see a dark shadow in the water. Really put yourself there, out in the water. You are treading water, and you see the shadow moving around you in the water, and then it comes up to the surface and you see a grey fin. You think to yourself **'I am really excited, I haven't seen a shark or anything like that before'**. You are out there in the water, all alone and you can see a grey fin slowly circling you. You are trying to swim back. Look down through the water, and you can see the sand, it is not too deep. Look and see the fin, watch it as it circles you. You think to yourself **'I am feeling safe, it's not too far to the shore'**. Really imagine you are out there in the water, away from the shore trying to swim in, and there is a grey fin, circling you. It looks like a shark. You are out there in the water alone, and then it disappears, so that all you can see is a dark shadow under the water. It is swimming slowly around you now, see it gradually moving closer to you. You are thinking to yourself **'I won't have any trouble swimming that far back to shore.'** You don't take your eyes off it, and you see the fin rising to the surface again. Really see it there, the dark grey of the fin moving towards you slowly, slowly. Imagine what it is like, all alone out there in the water trying to swim in to shore with a shark circling you. You are thinking **'I am a great swimmer, I will be OK'**. It is getting slowly closer and closer to you, look and see its fin coming out of the water. Really imagine yourself there. You think to yourself '**I feel great swimming out here'**.

3. Coping Statements

Imagine yourself at the beach and on a lovely day. Really see yourself there on your favourite beach. Really imagine the beach there. You decide to go for a swim out into the water. Feel the water against your skin as you get in. Really imagine yourself swimming out into the water. Even if you are not very good at swimming, on this day you can swim really well. Really put yourself there, swimming out into the water. All of a sudden you realise that you are out too far, and you think **'I should get someone's attention'**. Really imagine yourself there, out too deep in the water. Look around you and you can a dark shadow in the water. You think to yourself **'What am I going to do?'** You are too far out and you can see a dark shadow moving in the water. You think to yourself **'If only I could do something so that this thing would go away'** The sun is still shining and you are out there in the water, a long way out. Really imagine yourself there, out in the water. You are out there in the water, and you can see a dark shadow in the water. Really put yourself there, out in the water. You are treading water, and you see the shadow moving around you in the water, and then it comes up to the surface and you see a grey fin. You think to yourself **'I've got to be careful it doesn't get me, I've got to get back in before it gets me'** You are out there in the water, all alone and you can see a grey fin slowly circling you. You are trying to swim back. Look down through the water, and you can see the sand, it is not too deep. Look and see the fin, watch it as it circles you. You think to yourself **'They tell me to stay calm when you see a shark, I've got to keep my eyes on it, watch it carefully'**. Really imagine you are out there in the water, away from the shore trying to swim in, and there is a grey fin, circling you. It looks like a shark. You are out there in the water alone, and then it disappears, so that all you can see is a dark shadow under the water. It is swimming slowly around you now, see it gradually moving closer to you. You are thinking to yourself **'I'm trying to pretend that I am not there'** You don't take your eyes off it, and you see the fin rising to the surface again. Really see it there, the dark grey of the fin moving towards you slowly, slowly. Imagine what it is like, all alone out there in the water trying to swim in to shore with a shark circling you. You are thinking **'I'm trying to swim faster and faster away from it, I have to swim as fast as I can'**. It is getting slowly closer and closer to you, look and see its fin coming out of the water. Really imagine yourself there.

You are out there in the water all alone, and there is the fin sticking up out of the water. Really see yourself there, out in the water. You can see the fin sticking up, and it is coming closer. All of a sudden you look more closely and the head comes up out of the water, look at the head and see that it is not a shark, but a dolphin! It is the smiling face of a dolphin there in front of you. Really see her there. She sticks her face up, and smiles at you, and makes that lovely noise that dolphins make. Really see her there. You are feeling much happier now because you know that you are safe. Really see as she jumps out of the water and plays around you, diving and jumping, showing off just for you. You are feeling great now, knowing that you are safe. The sun is shining and you can't wait to get back to the shore and tell you friends about it. You feel great!

Debrief:

1. You felt a bit upset when you were imagining that scene, how do you feel now that it is over and you know it is not real?
2. Do you think that could happen at your favourite beach?
3. How would you make sure that it didn't happen?

Neutral

OK, sit back in your chair and get yourself really comfortable. I want you to close your eyes and just listen to my voice and imagine what I am saying as clearly as if you were actually there.

Imagine you are at home and you are about to go out for a walk along your street. Really see yourself there. Can you see it? Really imagine what it is like, look around you and see the inside of your house, near the front door. Really imagine yourself there. See the front door of your house, notice what it looks like. You can hear the sounds of your house around you, notice what sounds there are. Really put yourself there at your front door waiting to go for a walk down your street. Really see yourself opening the front door. Look outside and see what is there outside the front door of your house. Look outside and you can see that it is a sunny day. You know that it will be quite warm outside. You walk out the front door and into the street. Really imagine yourself there, walking out into your street. Really see what it looks like as you walk out into the street, look around you and notice what things look like. Can you see it? You are starting to walk down the street, look and see the trees and plants in the gardens. Look around you and see the other houses in your street. Can you see them? Really see yourself there. Really imagine yourself there, walking along your street. Look across the road at the house over there, really notice what it looks like. You can see there is a man in the front yard of the house over the road. Really see him there. He's doing something in his garden. Really put yourself there, walking along your street, watching the man in his garden.

Appendix C: Additional Data and Analyses

C1: Mean responses and ANOVA for each FSSC-II item by grade: Experiment 1

	Grade					
Item	3	4	5	7	10	F Score
1	1.10 (0.4)	1.20 (0.5)	1.19 (0.4)	1.14 (0.4)	1.22 (0.4)	F(4, 305)=0.92
2	1.46 (0.7)	1.44 (0.6)	1.52 (0.7)	1.28 (0.5)	1.33 (0.6)	F(4, 304)=1.64
3	1.27 (0.5)	1.34 (0.6)	1.52 (0.7)	1.25 (0.5)	1.25 (0.5)	F(4, 304)=2.25
4	1.02 (0.1)	1.02 (0.1)	1.02 (0.1)	1.02 (0.1)	1.00 (0.0)	F(4, 303)=0.30
5	1.24 (0.5)	1.50 (0.6)	1.27 (0.5)	1.10 (0.3)	1.18 (0.4)	F(4, 303)=6.44*
6	1.03 (0.2)	1.16 (0.5)	1.10 (0.4)	1.09 (0.3)	1.12 (0.4)	F(4, 304)=1.01
7	1.62 (0.6)	1.66 (0.7)	1.65 (0.8)	1.58 (0.6)	1.73 (0.7)	F(4, 300)=0.47
8	1.52 (0.7)	1.55 (0.7)	1.33 (0.6)	1.32 (0.5)	1.36 (0.7)	F(4, 303)=1.90
9	1.27 (0.6)	1.19 (0.5)	1.15 (0.5)	1.16 (0.4)	1.17 (0.5)	F(4, 302)=0.63
10	1.23 (0.5)	1.56 (0.7)	1.44 (0.6)	1.30 (0.5)	1.43 (0.6)	F(4, 304)=3.21*
11	1.96 (0.8)	2.09 (0.8)	1.96 (0.8)	1.71 (0.8)	1.70 (0.7)	F(4, 302)=3.07*
12	1.18 (0.5)	1.23 (0.6)	1.56 (0.7)	1.16 (0.4)	1.18 (0.5)	F(4, 303)=5.33*
13	2.13 (0.8)	2.22 (0.8)	2.17 (0.8)	1.95 (0.8)	1.94 (0.8)	F(4, 306)=1.58
14	2.27 (0.8)	2.38 (0.8)	2.32 (0.7)	2.17 (0.7)	1.67 (0.7)	F(4, 305)=9.83*
15	1.18 (0.5)	1.31 (0.6)	1.49 (0.7)	1.19 (0.5)	1.18 (0.4)	F(4, 304)=3.24*
16	1.18 (0.5)	1.34 (0.5)	1.40 (0.5)	1.41 (0.5)	1.82 (0.6)	F(4, 305)=13.07*
17	1.30 (0.6)	1.31 (0.6)	1.25 (0.5)	1.14 (0.4)	1.03 (0.2)	F(4, 306)=4.00*
18	1.43 (0.7)	1.54 (0.8)	1.75 (0.7)	1.45 (0.7)	1.81 (0.8)	F(4, 306)=3.62*
19	2.13 (0.8)	2.14 (0.8)	2.33 (0.9)	2.11 (0.8)	1.90 (0.7)	F(4, 306)=2.21
20	1.24 (0.5)	1.46 (0.6)	1.48 (0.6)	1.27 (0.5)	1.19 (0.5)	F(4, 305)=3.50*
21	1.60 (0.7)	1.55 (0.7)	1.56 (0.7)	1.42 (0.6)	1.42 (0.6)	F(4, 306)=1.04
22	2.34 (0.7)	2.32 (0.8)	2.45 (0.7)	2.17 (0.7)	1.96 (0.8)	F(4, 303)=3.75*
23	2.06 (0.8)	2.00 (0.8)	2.15 (0.7)	2.03 (0.8)	1.94 (0.7)	F(4, 303)=0.60
24	1.13 (0.4)	1.31 (0.5)	1.17 (0.4)	1.13 (0.3)	1.48 (0.5)	F(4, 305)=7.57*
25	1.91 (0.9)	1.94 (0.8)	2.08 (0.8)	1.70 (0.7)	1.57 (0.6)	F(4, 305)=4.28*
26	1.90 (0.8)	2.08 (0.9)	1.85 (0.7)	1.81 (0.8)	1.81 (0.7)	F(4, 305)=1.27
27	1.24 (0.6)	1.20 (0.6)	1.51 (0.9)	1.06 (0.4)	1.04 (0.3)	F(4, 305)=5.98*
28	2.57 (0.7)	2.44 (0.8)	2.57 (0.7)	2.36 (0.7)	2.24 (0.7)	F(4, 303)=2.46*
29	1.16 (0.4)	1.31 (0.5)	1.17 (0.4)	1.13 (0.4)	1.18 (0.4)	F(4, 305)=1.74
30	1.70 (0.7)	1.65 (0.7)	1.98 (0.8)	1.46 (0.6)	1.37 (0.5)	F(4, 299)=6.66*
31	2.18 (0.8)	2.35 (0.8)	2.17 (0.8)	1.86 (0.8)	1.60 (0.6)	F(4, 302)=9.68*
32	2.49 (0.8)	2.42 (0.8)	2.52 (0.7)	2.22 (0.9)	2.03 (0.8)	F(4, 304)=4.11*
33	2.39 (0.7)	2.35 (0.8)	2.34 (0.7)	2.13 (0.8)	1.82 (0.7)	F(4, 305)=6.64*
34	1.77 (0.8)	1.86 (0.9)	1.73 (0.8)	1.39 (0.6)	1.25 (0.5)	F(4, 304)=9.16*
35	1.39 (0.7)	1.34 (0.6)	1.44 (0.5)	1.31 (0.6)	1.25 (0.5)	F(4, 306)=0.80
36	2.40 (0.7)	2.25 (0.8)	2.44 (0.8)	2.34 (0.7)	2.15 (0.7)	F(4, 306)=1.57
37	1.85 (0.8)	1.88 (0.8)	2.19 (0.7)	1.73 (0.7)	1.55 (0.6)	F(4, 304)=5.78*
38	2.42 (0.8)	2.38 (0.7)	2.50 (0.7)	2.36 (0.7)	2.21 (0.8)	F(4, 305)=1.24

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	Grade					
Item	3	4	5	7	10	F Score
39	1.43 (0.6)	1.35 (0.6)	1.54 (0.6)	1.15 (0.4)	1.24 (0.5)	F(4, 304)=4.86*
40	1.33 (0.6)	1.48 (0.7)	1.29 (0.5)	1.27 (0.5)	1.33 (0.5)	F(4, 305)=1.40
41	1.75 (0.8)	1.62 (0.8)	1.79 (0.7)	1.77 (0.8)	1.31 (0.5)	F(4, 306)=4.87*
42	1.75 (0.8)	1.73 (0.8)	2.02 (0.7)	1.61 (0.7)	1.64 (0.7)	F(4, 305)=2.36
43	2.03 (0.8)	2.08 (0.9)	2.25 (0.8)	1.79 (0.8)	1.66 (0.7)	F(4, 302)=4.99*
44	1.61 (0.7)	1.60 (0.7)	1.79 (0.7)	1.66 (0.7)	1.34 (0.5)	F(4, 306)=3.50*
45	2.11 (0.7)	2.08 (0.7)	2.23 (0.8)	2.02 (0.7)	1.96 (0.6)	F(4, 303)=1.24
46	1.78 (0.7)	1.82 (0.8)	1.85 (0.7)	1.31 (0.5)	1.21 (0.4)	F(4, 306)=14.53*
47	1.76 (0.7)	1.82 (0.8)	1.69 (0.7)	1.69 (0.6)	1.88 (0.7)	F(4, 306)=0.84
48	1.73 (0.6)	1.66 (0.7)	1.85 (0.6)	1.81 (0.6)	1.76 (0.6)	F(4, 304)=0.84
49	1.60 (0.7)	1.68 (0.7)	1.56 (0.6)	1.42 (0.6)	1.21 (0.4)	F(4, 306)=6.02*
50	1.37 (0.6)	1.31 (0.5)	1.33 (0.5)	1.11 (0.3)	1.10 (0.4)	F(4, 306)=4.85*
51	1.97 (0.8)	2.06 (0.8)	2.17 (0.8)	1.87 (0.7)	1.72 (0.6)	F(4, 304)=3.16*
52	1.60 (0.7)	1.45 (0.7)	1.73 (0.7)	1.30 (0.5)	1.33 (0.6)	F(4, 304)=4.31*
53	1.35 (0.6)	1.40 (0.7)	1.56 (0.7)	1.21 (0.4)	1.21 (0.5)	F(4, 304)=3.64*
54	1.21 (0.5)	1.49 (0.7)	1.33 (0.6)	1.33 (0.6)	1.33 (0.6)	F(4, 306)=1.81
55	1.56 (0.7)	1.69 (0.7)	1.69 (0.6)	1.48 (0.6)	1.64 (0.7)	F(4, 305)=1.19
56	2.37 (0.8)	2.12 (0.9)	2.23 (0.8)	2.00 (0.8)	1.69 (0.7)	F(4, 305)=7.15*
57	1.64 (0.8)	1.58 (0.7)	1.83 (0.8)	1.36 (0.6)	1.36 (0.6)	F(4, 305)=4.51*
58	1.24 (0.5)	1.35 (0.6)	1.52 (0.7)	1.23 (0.5)	1.10 (0.3)	F(4, 306)=4.91*
59	1.12 (0.4)	1.29 (0.6)	1.31 (0.6)	1.28 (0.5)	1.30 (0.5)	F(4, 305)=1.53
60	1.52 (0.6)	1.38 (0.6)	1.50 (0.7)	1.45 (0.6)	1.48 (0.6)	F(4, 304)=0.47
61	1.30 (0.5)	1.23 (0.5)	1.29 (0.6)	1.08 (0.3)	1.33 (0.6)	F(4, 306)=2.54*
62	1.21 (0.5)	1.22 (0.6)	1.27 (0.6)	1.11 (0.4)	1.04 (0.2)	F(4, 305)=2.31
63	1.09 (0.3)	1.11 (0.4)	1.10 (0.4)	1.05 (0.3)	1.03 (0.2)	F(4, 304)=0.83
64	2.28 (0.8)	2.34 (0.8)	2.40 (0.8)	2.39 (0.7)	2.21 (0.8)	F(4, 306)=0.61
65	1.55 (0.7)	1.55 (0.7)	1.46 (0.6)	1.31 (0.5)	1.33 (0.5)	F(4, 305)=2.22
66	1.60 (0.8)	1.58 (0.7)	1.87 (0.7)	1.42 (0.6)	1.40 (0.7)	F(4, 305)=3.78*
67	2.00 (0.9)	1.88 (0.8)	1.94 (0.8)	1.73 (0.7)	1.63 (0.8)	F(4, 304)=2.37
68	1.97 (0.8)	1.89 (0.8)	2.00 (0.7)	1.50 (0.6)	1.54 (0.5)	F(4, 305)=7.70*
69	1.31 (0.6)	1.32 (0.6)	1.14 (0.5)	1.16 (0.4)	1.03 (0.2)	F(4, 306)=3.88*
70	1.44 (0.6)	1.37 (0.6)	1.48 (0.7)	1.31 (0.5)	1.28 (0.6)	F(4, 305)=1.14
71	1.36 (0.6)	1.48 (0.6)	1.54 (0.7)	1.28 (0.6)	1.21 (0.4)	F(4, 305)=2.95*
72	1.48 (0.7)	1.48 (0.7)	1.23 (0.5)	1.25 (0.5)	1.22 (0.5)	F(4, 306)=3.15*
73	1.39 (0.6)	1.42 (0.6)	1.50 (0.7)	1.28 (0.5)	1.42 (0.6)	F(4, 306)=1.02
74	1.07 (0.3)	1.26 (0.5)	1.27 (0.6)	1.06 (0.2)	1.21 (0.4)	F(4, 305)=3.38*
75	1.63 (0.7)	1.72 (0.8)	1.65 (0.7)	1.48 (0.6)	1.25 (0.5)	F(4, 305)=5.06*
76	1.52 (0.7)	1.74 (0.8)	1.71 (0.7)	1.31 (0.5)	1.31 (0.6)	F(4, 306)=5.70*
77	2.28 (0.8)	2.18 (0.9)	2.54 (0.7)	1.87 (0.8)	1.90 (0.8)	F(4, 304)=7.08*
78	2.09 (0.8)	2.09 (0.9)	2.29 (0.8)	1.91 (0.9)	1.93 (0.8)	F(4, 306)=1.90

*=p<0.05

C2: Mean responses and ANOVA for each FSSC-II item (with no significant effect of grade overall) for males and females separately by grade: Experiment 1

Females

	Grade					
Item	3	4	5	7	10	F Score
1	1.13 (0.4)	1.34 (0.6)	1.30 (0.5)	1.29 (0.5)	1.37 (0.5)	F(4,131)=1.00
2	1.50 (0.7)	1.50 (0.6)	1.50 (0.6)	1.21 (0.4)	1.37 (0.6)	F(4,131)=1.16
3	1.40 (0.6)	1.44 (0.6)	2.00 (0.7)	1.50 (0.7)	1.33 (0.5)	F(4,131)=3.96*
4	1.00 (0.0)	1.03 (0.2)	1.05 (0.2)	1.04 (0.2)	1.00 (0.0)	F(4,131)=0.65
6	1.03 (0.2)	1.19 (0.5)	1.20 (0.5)	1.25 (0.5)	1.23 (0.5)	F(4,131)=0.97
7	1.66 (0.5)	1.66 (0.7)	2.10 (0.7)	1.75 (0.7)	1.80 (0.7)	F(4,130)=1.78
8	1.60 (0.7)	1.78 (0.7)	1.45 (0.5)	1.63 (0.6)	1.50 (0.7)	F(4,131)=1.05
9	1.40 (0.7)	1.31 (0.6)	1.05 (0.2)	1.17 (0.4)	1.27 (0.6)	F(4,131)=1.44
13	2.23 (0.8)	2.47 (0.7)	2.30 (0.7)	2.04 (0.7)	2.13 (0.8)	F(4,131)=1.34
19	2.33 (0.8)	2.31 (0.7)	2.65 (0.7)	2.67 (0.5)	2.17 (0.5)	F(4,131)=2.82*
21	1.87 (0.8)	1.78 (0.8)	1.90 (0.6)	1.71 (0.6)	1.50 (0.6)	F(4,131)=1.36
23	2.30 (0.7)	2.06 (0.7)	2.25 (0.6)	2.38 (0.7)	2.03 (0.7)	F(4,131)=1.32
26	2.17 (0.8)	2.19 (0.9)	2.15 (0.5)	2.21 (0.8)	1.97 (0.8)	F(4,131)=0.46
29	1.30 (0.5)	1.44 (0.6)	1.25 (0.4)	1.17 (0.5)	1.20 (0.5)	F(4,131)=1.27
35	1.60 (0.8)	1.47 (0.7)	1.45 (0.5)	1.58 (0.8)	1.37 (0.6)	F(4,131)=0.56
36	2.67 (0.6)	2.53 (0.7)	2.60 (0.6)	2.88 (0.3)	2.33 (0.5)	F(4,131)=3.08*
38	2.63 (0.6)	2.38 (0.7)	2.40 (0.8)	2.71 (0.6)	2.30 (0.8)	F(4,131)=1.84
40	1.47 (0.6)	1.59 (0.7)	1.50 (0.5)	1.33 (0.6)	1.27 (0.4)	F(4,131)=1.46
42	1.93 (0.8)	2.00 (0.8)	2.30 (0.5)	2.08 (0.8)	2.03 (0.7)	F(4,130)=0.81
45	2.29 (0.7)	2.23 (0.6)	2.45 (0.7)	2.42 (0.7)	2.10 (0.7)	F(4,128)=1.18
47	1.87 (0.7)	1.91 (0.8)	1.90 (0.6)	1.88 (0.6)	1.93 (0.6)	F(4,131)=0.05
48	1.90 (0.6)	1.90 (0.7)	2.05 (0.6)	2.17 (0.6)	1.93 (0.6)	F(4,129)=0.98
54	1.30 (0.5)	1.75 (0.8)	1.60 (0.6)	1.75 (0.7)	1.67 (0.8)	F(4,131)=2.08
55	1.55 (0.7)	1.94 (0.7)	1.80 (0.5)	1.67 (0.5)	1.83 (0.7)	F(4,130)=1.61
59	1.14 (0.4)	1.44 (0.7)	1.40 (0.7)	1.25 (0.4)	1.27 (0.4)	F(4,130)=1.48
60	1.67 (0.6)	1.59 (0.7)	1.65 (0.7)	1.71 (0.7)	1.67 (0.5)	F(4,131)=0.12
62	1.34 (0.6)	1.34 (0.7)	1.40 (0.8)	1.29 (0.6)	1.10 (0.3)	F(4,130)=1.01
63	1.07 (0.3)	1.22 (0.5)	1.10 (0.3)	1.13 (0.4)	1.07 (0.3)	F(4,130)=0.89
64	2.27 (0.8)	2.59 (0.7)	2.35 (0.7)	2.75 (0.4)	2.40 (0.8)	F(4,131)=2.01
65	1.62 (0.7)	1.91 (0.8)	1.65 (0.6)	1.58 (0.7)	1.53 (0.6)	F(4,130)=1.42
67	2.31 (0.8)	2.22 (0.8)	2.25 (0.5)	2.12 (0.7)	1.83 (0.8)	F(4,130)=1.88
70	1.69 (0.7)	1.53 (0.7)	1.75 (0.8)	1.50 (0.6)	1.47 (0.7)	F(4,130)=0.79
73	1.53 (0.6)	1.53 (0.7)	1.65 (0.7)	1.38 (0.6)	1.50 (0.6)	F(4,131)=0.55
78	2.20 (0.8)	2.47 (0.7)	2.40 (0.7)	2.33 (0.8)	2.07 (0.8)	F(4,131)=1.30

cont...

Males

	Grade					
Item	**3**	**4**	**5**	**7**	**10**	**F Score**
1	1.08 (0.3)	1.06 (0.4)	1.11 (0.3)	1.05 (0.2)	1.11 (0.3)	F(4,169)=0.27
2	1.43 (0.6)	1.38 (0.5)	1.54 (0.7)	1.33 (0.5)	1.31 (0.5)	F(4,168)=0.82
3	1.17 (0.4)	1.25 (0.5)	1.18 (0.4)	1.10 (0.4)	1.19 (0.4)	F(4,168)=0.61
4	1.03 (0.2)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	F(4,167)=0.98
6	1.03 (0.2)	1.13 (0.5)	1.04 (0.2)	1.00 (0.0)	1.03 (0.2)	F(4,168)=1.24
7	1.58 (0.7)	1.66 (0.8)	1.32 (0.6)	1.48 (0.6)	1.68 (0.6)	F(4,165)=1.48
8	1.44 (0.7)	1.31 (0.5)	1.25 (0.6)	1.13 (0.3)	1.24 (0.6)	F(4,167)=1.64
9	1.16 (0.5)	1.06 (0.2)	1.21 (0.6)	1.15 (0.5)	1.08 (0.3)	F(4,168)=0.64
13	2.05 (0.8)	1.97 (0.8)	2.07 (0.9)	1.90 (0.8)	1.78 (0.8)	F(4,170)=0.71
19	1.97 (0.8)	1.97 (0.9)	2.11 (0.9)	1.78 (0.7)	1.68 (0.7)	F(4,170)=1.53
21	1.38 (0.6)	1.33 (0.5)	1.32 (0.6)	1.25 (0.4)	1.35 (0.5)	F(4,170)=0.29
23	1.86 (0.8)	1.94 (0.9)	2.07 (0.7)	1.82 (0.7)	1.86 (0.7)	F(4,167)=0.54
26	1.68 (0.8)	1.97 (0.8)	1.64 (0.8)	1.56 (0.7)	1.68 (0.7)	F(4,169)=1.39
29	1.05 (0.2)	1.18 (0.4)	1.11 (0.3)	1.10 (0.3)	1.16 (0.4)	F(4,169)=0.87
35	1.22 (0.5)	1.21 (0.5)	1.43 (0.6)	1.15 (0.4)	1.16 (0.4)	F(4,170)=1.60
36	2.19 (0.8)	1.97 (0.8)	2.32 (0.9)	2.03 (0.7)	2.00 (0.7)	F(4,170)=1.20
38	2.25 (0.9)	2.39 (0.8)	2.57 (0.6)	2.15 (0.8)	2.14 (0.8)	F(4,169)=1.80
40	1.22 (0.5)	1.36 (0.6)	1.14 (0.4)	1.23 (0.5)	1.39 (0.5)	F(4,169)=1.42
42	1.59 (0.8)	1.48 (0.8)	1.82 (0.8)	1.33 (0.6)	1.32 (0.5)	F(4,170)=2.89*
45	1.97 (0.7)	1.94 (0.7)	2.07 (0.8)	1.78 (0.6)	1.84 (0.6)	F(4,169)=1.01
47	1.68 (0.8)	1.73 (0.8)	1.54 (0.7)	1.58 (0.6)	1.84 (0.7)	F(4,170)=0.91
48	1.59 (0.7)	1.42 (0.6)	1.71 (0.5)	1.60 (0.6)	1.62 (0.6)	F(4,170)=0.90
54	1.14 (0.5)	1.24 (0.6)	1.14 (0.4)	1.08 (0.3)	1.05 (0.2)	F(4,170)=1.12
55	1.57 (0.7)	1.45 (0.5)	1.61 (0.6)	1.38 (0.6)	1.49 (0.7)	F(4,170)=0.78
59	1.11 (0.4)	1.15 (0.4)	1.25 (0.6)	1.30 (0.6)	1.32 (0.5)	F(4,170)=1.32
60	1.41 (0.6)	1.18 (0.5)	1.39 (0.6)	1.29 (0.5)	1.32 (0.5)	F(4,168)=0.87
62	1.11 (0.4)	1.09 (0.4)	1.18 (0.4)	1.00 (0.0)	1.00 (0.0)	F(4,170)=2.29
63	1.11 (0.4)	1.00 (0.0)	1.11 (0.4)	1.00 (0.0)	1.00 (0.0)	F(4,169)=1.99
64	2.30 (0.9)	2.09 (0.9)	2.43 (0.8)	2.17 (0.8)	2.05 (0.7)	F(4,170)=1.11
65	1.49 (0.7)	1.21 (0.5)	1.32 (0.6)	1.15 (0.4)	1.16 (0.4)	F(4,170)=2.75*
67	1.75 ()0.9	1.54 (0.7)	1.71 (0.8)	1.50 (0.6)	1.46 (0.7)	F(4,169)=1.07
70	1.24 (0.5)	1.21 (0.5)	1.29 (0.5)	1.20 (0.4)	1.14 (0.3)	F(4,170)=0.53
73	1.27 (0.6)	1.30 (0.5)	1.39 (0.6)	1.23 (0.5)	1.35 (0.5)	F(4,170)=0.48
78	2.00 (0.9)	1.73 (0.9)	2.21 (0.8)	1.65 (0.8)	1.81 (0.8)	F(4,170)=2.32

C3: Means and standard deviations (in parentheses) for males and females on selected FSSC-II items with t test results: Experiment 1

Item		Females	Males	t
	Factor 1: Fear of Death and Danger:			
13	Nuclear war	2.24 (0.76)	1.95 (0.83)	t(309)=3.23**
23	Getting a serious illness	2.19 (0.69)	1.90 (0.75)	t(306)=3.49**
36	Being threatened with a gun	2.59 (0.60)	2.09 (0.77)	t(309)=6.21**
38	Not being able to breathe	2.48 (0.69)	2.28 (0.78)	t(308)=2.32*
45	Someone in my family having an accident	2.28 (0.67)	1.91 (0.67)	t(306)=4.80**
48	Someone in my family getting sick	1.98 (0.59)	1.59 (0.62)	t(307)=5.58**
64	AIDS	2.47 (0.72)	2.20 (0.82)	t(309)=3.04**
	Factor 2: Fear of The Unknown			
8	Being in closed places	1.60 (0.66)	1.27 (0.55)	t(306)=4.78**
21	Being in a fight	1.74 (0.72)	1.33 (0.55)	t(309)=5.79**
35	Ghosts or spooky things	1.49 (0.69)	1.22 (0.49)	t(309)=4.02**
54	Rats	1.61 (0.71)	1.13 (0.41)	t(309)=7.54**
62	Thunder	1.29 (0.61)	1.07 (0.30)	t(308)=4.19**
	Factor 3: Fear of Failure and Criticism			
1	Being teased	1.29 (0.50)	1.08 (0.29)	t(308)=4.53**
2	Rides like the big dipper	1.42 (0.60)	1.39 (0.58)	t(307)=0.47ns
7	Losing my friends	1.77 (0.66)	1.55 (0.67)	t(303)=2.91**
29	Making mistakes	1.28 (0.51)	1.12 (0.33)	t(308)=3.32**
40	Failing a test	1.43 (0.59)	1.27 (0.51)	t(308)=2.62**
47	Having no friends	1.90 (0.66)	1.67 (0.74)	t(309)=2.75**
55	Going to a new school	1.76 (0.65)	1.49 (0.61)	t(308)=3.76**
59	Sitting for a test	1.30 (0.53)	1.23 (0.50)	t(308)=1.15ns
60	Being bullied	1.65 (0.64)	1.32 (0.56)	t(307)=4.94**
73	Looking foolish	1.51 (0.62)	1.30 (0.55)	t(309)=3.18**
	Factor 4: Psychic stress and medical fears			
9	Going to the doctor	1.26 (0.56)	1.13 (0.43)	(307)=2.21*
26	Having and operation	2.13 (0.77)	1.70 (0.77)	(308)=4.90**
63	Lizards	1.12 (0.37)	1.04 (0.25)	(307)=2.23*
70	Cemeteries	1.58 (0.70)	1.21 (0.44)	(308)=5.67**
	Factor 5: Animal fears			
78	Sharks	2.29 (0.77)	1.86 (0.86)	t(309)=4.51**

*=p<0.05
**=p<0.01

C4: Means and standard deviations (in parentheses) for STAI and STAIC state anxiety by presentation condition and grade for baseline, the operation, shark, friends and neutral scenarios: Experiment 4

	Scenario Presentation Condition			
	Positive	Coping	Threat	Total
Grade				
Baseline				
3	27.63 (3.8)	27.94 (4.7)	28.74 (4.0)	**28.11 (4.1)**
5	30.56 (7.5)	27.59 (5.2)	29.35 (5.5)	**29.23 (6.2)**
7	**32.79** (7.7)	29.65 (5.7)	28.67 (3.7)	**30.39 (6.1)**
Total	**30.35 (6.9)**	**28.38 (5.2)**	**28.95 (4.5)**	29.25 (5.7)
10	35.10 (12.0)	33.83 (12.6)	32.13 (8.3)	**33.61 (10.8)**
Operation Scenario				
3	33.63 (7.2)	45.56 (9.6)	49.50 (8.1)	**42.96 (10.7)**
5	36.25 (10.3)	48.65 (6.9)	48.75 (9.4)	**44.55 (10.6)**
7	45.11 (7.8)	48.50 (6.9)	48.06 (8.0)	**47.23 (7.6)**
Total	**38.29 (9.7)**	**47.64 (7.8)**	**48.79 (8.4)**	44.91 (9.9)
10	53.28 (12.7)	59.24 (17.0)	57.83 (15.5)	**56.83 (15.1)**
Friends Scenario				
3	33.63 (7.5)	46.18 (8.0)	47.53 (9.8)	**42.31(10.5)**
5	41.50 (8.3)	44.84 (8.2)	47.95 (11.0)	**44.71 (9.5)**
7	42.89 (12.3)	43.50 (9.5)	50.88 (6.7)	**45.48 (10.3)**
Total	**39.32 (10.2)**	**44.77 (8.5)**	**48.67 (9.4)**	44.17 (10.1)
10	53.60 (15.3)	59.17 (14.8)	61.14 (14.4)	**58.03 (14.9)**
Shark Scenario				
3	39.53 (12.1)	47.22 (12.5)	50.80 (7.8)	**45.91 (11.8)**
5	45.04 (11.1)	48.42 (8.0)	51.21 (8.3)	**47.92 (9.6)**
7	52.39 (7.1)	49.68 (6.7)	51.47 (7.1)	**51.15 (6.9)**
Total	**45.48 (11.4)**	**48.46 (9.2)**	**51.14 (7.6)**	48.26 (9.9)
10	59.85 (11.2)	63.59 (12.9)	65.05 (10.4)	**62.86 (11.5)**
Neutral Scenario				
3	27.00 (6.1)	26.33 (4.7)	27.26 (7.2)	**26.85 (6.0)**
5	27.35 (9.3)	26.39 (6.1)	25.32 (5.7)	**26.37 (7.2)**
7	**27.57** (4.2)	25.64 (4.9)	27.81 (4.8)	**26.95 (4.7)**
Total	**27.29 (7.6)**	**26.16 (5.2)**	**26.74 (6.1)**	26.68 (6.2)
10	**27.25** (8.2)	31.56 (9.5)	29.00 (14.3)	**29.94 (11.6)**

C5: Means and standard deviations (in parentheses) for STAI and STAIC state anxiety by gender for baseline, the operation, friends, shark and neutral scenarios: Experiment 4

	STAIC		STAI	
	Female	**Male**	**Female**	**Male**
Baseline	29.42 (6.0)	29.05 (5.3)	36.04 (4.8)	31.68 (11.4)
Operation	46.60 (9.4)	42.96 (10.0)	59.62 (12.7)	54.56 (16.7)
Friends	45.48 (9.5)	42.64 (10.7)	59.15 (13.6)	57.12 (16.1)
Shark	50.30 (9.0)	45.76 (10.3)	66.31 (8.0)	60.15 (13.1)
Neutral	26.81 (6.5)	26.55 (6.0)	35.67 (15.2)	25.86 (5.6)

C6: Means and standard deviations (in parentheses) for the operation TCL positive, coping and threat scales by presentation condition and grade: Experiment 4

	Scenario Presentation Condition			
	Positive	Coping	Threat	Total
Grade				
Positive Statements				
3	6.84 (2.9)	6.06 (2.5)	2.73 (2.0)	**5.38 (3.0)**
5	4.80 (3.1)	4.05 (2.5)	4.37 (3.1)	**4.41 (2.9)**
7	5.05 (2.9)	3.90 (2.3)	4.44 (2.2)	**4.46 (2.5)**
10	5.22 (3.5)	4.47 (3.1)	5.50 (3.2)	**5.11 (3.2)**
Total	**5.47 (3.1)**	**4.59 (2.7)**	**4.39 (2.9)**	**4.82 (2.9)**
Coping Statements				
3	6.74 (1.3)	5.50 (2.9)	5.73 (2.2)	**6.02 (2.2)**
5	4.20 (2.9)	5.55 (2.8)	6.63 (1.8)	**5.44 (2.7)**
7	6.58 (1.9)	5.45 (2.7)	6.11 (2.0)	**6.04 (2.2)**
10	4.33 (2.2)	4.82 (3.2)	4.91 (1.7)	**4.70 (2.3)**
Total	**5.46 (2.4)**	**5.35 (2.8)**	**5.81 (2.0)**	**5.54 (2.4)**
Threat Statements				
3	4.95 (3.2)	5.28 (3.1)	6.80 (2.3)	**5.60 (3.0)**
5	4.70 (3.5)	6.05 (2.6)	6.53 (3.1)	**5.75 (3.1)**
7	6.47 (3.2)	6.40 (2.8)	7.22 (2.5)	**6.68 (2.8)**
10	4.50 (3.3)	5.41 (2.7)	5.73 (3.3)	**5.25 (3.1)**
Total	**5.16 (3.3)**	**5.81 (2.8)**	**6.51 (2.9)**	**5.82 (3.1)**

C7: Means and standard deviations (in parentheses) for the operation TCL scales by gender: Experiment 4

	Female	Male
Positive Statements	4.53 (2.7)	5.13 (3.1)
Coping Statements	5.91 (2.5)	5.15 (2.3)
Threat Statements	6.16 (3.0)	5.47 (3.1)

C8: Means and standard deviations (in parentheses) for the friends TCL positive, coping and threat scales by presentation condition and grade: Experiment 4

	Scenario Presentation Condition			
	Positive	Coping	Threat	Total
Grade				
Positive Statements				
3	6.79 (2.3)	4.47 (2.5)	3.42 (2.7)	**4.91 (2.8)**
5	5.40 (2.5)	3.68 (2.7)	3.42 (3.7)	**4.19 (3.1)**
7	4.53 (2.5)	3.84 (2.7)	3.63 (2.8)	**4.02 (2.6)**
10	4.00 (2.6)	3.39 (2.9)	3.10 (2.7)	**3.49 (2.7)**
Total	**5.17 (2.7)**	**3.84 (2.7)**	**3.37 (2.9)**	**4.14 (2.9)**
Coping Statements				
3	6.37 (2.5)	6.94 (2.5)	4.95 (3.0)	**6.05 (2.8)**
5	5.35 (2.9)	7.21 (2.3)	6.58 (2.1)	**6.36 (2.6)**
7	7.21 (2.4)	7.42 (1.5)	6.13 (3.0)	**6.96 (2.4)**
10	5.00 (2.6)	6.39 (2.1)	5.52 (1.9)	**5.61 (2.2)**
Total	**5.96 (2.7)**	**7.00 (2.1)**	**5.77 (2.5)**	**6.23 (2.5)**
Threat Statements				
3	4.32 (2.4)	5.41 (2.1)	6.32 (3.1)	**5.35 (2.7)**
5	4.95 (3.4)	5.74 (3.0)	6.79 (3.7)	**5.81 (3.4)**
7	7.26 (3.1)	6.53 (2.9)	6.50 (3.6)	**6.78 (3.1)**
10	4.40 (3.6)	5.83 (2.5)	6.81 (3.3)	**5.69 (3.3)**
Total	**5.22 (3.3)**	**5.89 (2.6)**	**6.61 (3.3)**	**5.90 (3.2)**

C9: Means and standard deviations (in parentheses) for the friends TCL by gender: Experiment 4

	Female	Male
Positive Statements	3.72 (2.8)	4.58 (2.9)
Coping Statements	6.55 (2.4)	5.90 (2.6)
Threat Statements	6.29 (2.9)	5.48 (3.3)

C10: Means and standard deviations (in parentheses) for the shark TCL positive, coping and threat scales by presentation condition and grade: Experiment 4

	Scenario Presentation Condition			
	Positive	Coping	Threat	Total
Grade				
Positive Statements				
3	5.55 (3.4)	3.28 (2.0)	3.45 (2.2)	**3.86 (2.6)**
5	3.60 (3.2)	2.89 (2.6)	2.63 (2.7)	**3.05 (2.8)**
7	2.89 (3.0)	3.16 (2.9)	2.71 (2.9)	**2.93 (2.9)**
10	2.60 (2.8)	2.00 (2.5)	1.90 (2.0)	**2.17 (2.4)**
Total	**3.43 (3.2)**	**2.85 (2.5)**	**2.66 (2.5)**	**2.97 (2.7)**
Coping Statements				
3	8.18 (2.0)	8.61 (1.7)	7.35 (1.9)	**8.00 (1.9)**
5	7.00 (2.5)	8.33 (1.7)	8.11 (1.4)	**7.78 (1.9)**
7	8.33 (1.7)	7.63 (2.6)	7.41 (1.7)	**7.80 (2.1)**
10	6.55 (2.7)	6.94 (2.0)	7.95 (1.9)	**7.17 (2.3)**
Total	**7.41 (2.4)**	**7.88 (2.0)**	**7.71 (1.7)**	**7.67 (2.1)**
Threat Statements				
3	6.27 (2.6)	7.89 (2.1)	7.20 (2.7)	**7.24 (2.5)**
5	6.60 (2.6)	7.37 (2.5)	7.26 (3.1)	**7.07 (2.7)**
7	8.22 (1.8)	6.58 (2.9)	8.00 (2.3)	**7.57 (2.5)**
10	6.70 (2.7)	7.18 (2.3)	8.10 (2.7)	**7.34 (2.6)**
Total	**7.00 (2.5)**	**7.25 (2.5)**	**7.64 (2.7)**	**7.31 (2.6)**

C11: Means and standard deviations (in parentheses) for the shark TCL by gender: Experiment 4

	Female	Male
Positive Statements	2.45 (2.5)	3.51 (2.9)
Coping Statements	8.16 (1.5)	7.16 (2.4)
Threat Statements	7.90 (2.3)	6.68 (2.7)

C12: Means and standard deviations (in parentheses) for STAIC p-state anxiety by grade and presentation condition for baseline, the operation, shark, friends and neutral scenarios: Experiment 4

	Scenario Presentation Condition			
	Positive	Coping	External	Total
Grade				
Baseline				
3	16.79 (3.9)	16.67 (4.1)	17.74 (3.2)	**17.07 (3.7)**
5	17.75 (5.0)	16.50 (3.9)	18.40 (4.1)	**17.55 (4.4)**
7	19.71 (3.8)	19.55 (5.4)	18.22 (3.6)	**19.20 (4.3)**
Total	**18.13 (4.4)**	**17.60 (4.7)**	**18.12 (3.6)**	**18.12 (4.2)**
Operation				
3	20.16 (4.9)	26.00 (3.9)	27.45 (3.8)	**24.56 (5.3)**
5	20.75 (6.1)	28.05 (2.5)	27.40 (3.3)	**25.40 (5.4)**
7	24.86 (4.8)	27.55 (3.0)	27.06 (3.3)	**26.44 (4.0)**
Total	**22.00 (5.6)**	**27.24 (3.3)**	**27.31 (3.4)**	**25.48 (4.9)**
Friends				
3	20.74 (4.7)	25.82 (4.2)	27.00 (5.0)	**24.47 (5.4)**
5	23.95 (5.3)	27.55 (3.5)	26.50 (4.7)	**25.98 (4.7)**
7	24.85 (4.8)	25.90 (4.9)	28.31 (2.8)	**26.21 (4.5)**
Total	**23.22 (5.2)**	**26.46 (4.3)**	**27.23 (4.3)**	**25.57 (4.9)**
Shark				
3	22.89 (6.8)	27.78 (4.2)	28.70 (3.3)	**26.47 (5.5)**
5	26.10 (3.8)	27.90 (3.2)	27.50 (4.2)	**27.16 (3.8)**
7	28.68 (2.4)	28.00 (2.8)	27.65 (3.7)	**28.13 (3.0)**
Total	**25.90 (5.2)**	**27.89 (3.4)**	**27.98 (3.7)**	**27.24 (4.3)**
Neutral				
3	16.27 (4.7)	15.39 (3.8)	15.74 (4.4)	**17.73 (4.2)**
5	14.75 (6.2)	16.43 (5.0)	15.08 (5.3)	**15.34 (5.5)**
7	15.83 (3.4)	16.69 (4.5)	16.64 (5.7)	**16.50 (4.6)**
Total	**15.39 (5.0)**	**15.56 (4.4)**	**15.49 (4.7)**	**15.37 (4.7)**

C13: Means and standard deviations (in parentheses) for STAIC n-state anxiety by grade and presentation condition for neutral, the operation, shark, friends and neutral scenarios: Experiment 4

	Scenario Presentation Condition			
	Positive	Coping	External	Total
Grade				
Baseline				
3	10.74 (1.2)	11.22 (2.0)	11.00 (2.0)	**11.46 (2.9)**
5	12.37 (4.2)	10.85 (1.9)	11.20 (2.1)	**11.54 (3.0)**
7	12.86 (4.4)	10.85 (1.8)	10.78 (1.2)	**10.98 (1.8)**
Total	**12.02 (3.7)**	**10.97 (1.9)**	**11.00 (1.8)**	**11.33 (2.6)**
Operation				
3	13.47 (2.9)	19.28 (6.0)	23.00 (6.4)	**18.65 (6.6)**
5	15.50 (5.9)	20.45 (5.5)	21.35 (6.3)	**19.10 (6.4)**
7	19.00 (5.1)	20.95 (4.9)	21.00 (5.1)	**20.27 (5.1)**
Total	**16.08 (5.3)**	**20.26 (5.4)**	**21.81 (6.0)**	**19.35 (6.0)**
Friends				
3	12.78 (3.5)	19.41 (5.5)	20.58 (5.9)	**17.61 (6.1)**
5	17.50 (5.4)	18.95 (6.2)	19.78 (6.6)	**18.71 (6.0)**
7	20.65 (8.1)	17.50 (5.4)	21.94 (5.1)	**19.89 (6.6)**
Total	**17.12 (6.8)**	**18.58 (5.7)**	**20.72 (5.9)**	**18.75 (6.3)**
Shark				
3	16.63 (5.8)	22.67 (6.3)	22.05 (5.3)	**20.44 (6.3)**
5	21.40 (7.1)	21.37 (6.0)	22.39 (6.2)	**21.70 (6.4)**
7	23.70 (4.9)	21.74 (4.8)	23.94 (4.3)	**23.11 (4.7)**
Total	**20.64 (6.6)**	**21.91 (5.6)**	**22.75 (5.3)**	**21.74 (5.9)**
Neutral				
3	10.73 (1.7)	10.94 (1.8)	10.53 (1.0)	**10.73 (1.5)**
5	11.55 (4.5)	11.00 (1.5)	11.08 (2.5)	**11.26 (3.2)**
7	11.33 (2.8)	10.08 (0.3)	10.18 (0.6)	**10.37 (1.3)**
Total	**11.35 (3.4)**	**11.10 (2.4)**	**11.80 (3.5)**	**11.68 (3.6)**

C14: ANOVA results for STAIC p-state anxiety by gender, presentation condition and grade for baseline, the operation, shark and friends and neutral scenarios: Experiment 4

	Baseline	Operation	Friends	Shark	Neutral
Gender	F(1, 157)=1.59	F(1, 158)=8.21*	F(1, 151)=5.93*	F(1, 152)=11.29*	F(1, 107)=1.12
Presentation	F(2, 157)=0.19	F(2, 158)=33.56*	F(2, 151)=12.70*	F(2, 152)=5.64*	F(2, 107)=0.57
Grade	F(2, 157)=0.24	F(3, 158)=2.95	F(3, 151)=2.71	F(3, 152)=2.61	F(3, 107)=0.12
Grade x Gender	F(2, 157)=0.32	F(2, 158)=0.09	F(2, 151)=0.72	F(2, 152)=3.51*	F(2, 107)=1.09
Grade x Presentation	F(4, 157)=0.52	F(4, 158)=2.97*	F(4, 151)=2.27	F(4, 152)=5.03*	F(4, 107)=0.56
Gender x Presentation	F(2, 157)=0.92	F(2, 158)=0.17	F(2, 151)=0.38	F(2, 152)=2.28	F(2, 107)=0.67
Grade x Gender x Presentation	F(4, 157)=0.40	F(4, 158)=1.10	F(4, 151)=3.07*	F(4, 152)=2.06	F(4, 107)=0.79

*p<0.05

C15: ANOVA results for STAIC n-state anxiety by gender, presentation condition and grade for baseline, the operation, shark and friends and neutral scenarios: Experiment 4

	Baseline	Operation	Friends	Shark	Neutral
Gender	F(1, 156)=0.00	F(1, 158)=7.36*	F(1, 150)=0.43	F(1, 150)=12.79*	F(1, 107)=0.64
Presentation	F(2, 156)=2.66	F(2, 158)=17.94*	F(2, 150)=5.57*	F(2, 150)=2.51	F(2, 107)=0.17
Grade	F(2, 156)=0.69	F(3, 158)=1.27	F(3, 150)=2.65	F(3, 150)=3.19	F(3, 107)=0.88
Grade x Gender	F(2, 156)=0.37	F(2, 158)=0.17	F(2, 150)=1.59	F(2, 150)=2.07	F(2, 107)=0.64
Grade x Presentation	F(4, 156)=1.38	F(4, 158)=0.14	F(4, 150)=0.49	F(4, 150)=1.51	F(4, 107)=0.60
Gender x Presentation	F(2, 156)=0.10	F(2, 158)=2.40	F(2, 150)=4.73*	F(2, 150)=3.18*	F(2, 107)=0.12
Grade x Gender x Presentation	F(4, 156)=0.33	F(4, 158)=0.70	F(4, 150)=4.74*	F(4, 150)=1.57	F(4, 152)=0.06

*p<0.05