SLEEP PROBLEMS IN ANXIOUS CHILDREN:  
A BEHAVIOURAL FAMILY INTERVENTION

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By

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ABSTRACT

This study used a multiple baseline across participants design to examine the relationship between sleep and anxiety in school-aged children, the effectiveness of a behavioural family intervention, and the co-existence of depression with children presenting with sleep disturbances and anxiety symptoms. The families of five school-aged children, three females and two males that met the selection criteria as having problematic sleep and anxiety participated in the study. Interventions incorporating a combination of strategies from sleep and anxiety research were individually designed for each child.

The hypotheses of the study were measured by the use of parent and child sleep diaries, the Child Behaviour Checklist (CBCL), the State-Trait Anxiety Inventory for Children (STAIC), and the Children’s Depression Inventory (CDI) and were administered at baseline, post-intervention, and follow-up. This study provides preliminary results that indicate a relationship between sleep and anxiety may occur. The use of a behavioural family intervention in the treatment of these problems showed mixed results, appearing most successful in reducing participants’ self-ratings of anxieties followed by reductions in parental presence and sleep onset latency. The co-occurrence of depression was indicated and symptoms decreased for those children whose sleep behaviours and anxiety problems improved. The limitations of this study and implications for future research and professional practice are discussed.
CHAPTER 1

Introduction and Literature Review

Sleep Disturbances in Children

Introduction

Childhood and pre-adolescence are important phases of physical, cognitive, emotional, and social change. During this developmental period children are constantly being challenged by new abilities, insights, and expectations (Wolfson, 1996). However, a child’s ability to think, behave and feel during this time and the way in which they cope with the challenges presented are significantly affected by their sleep (Mindell, Owens, & Carskadon, 1999). Similarly, the challenges they are presented with during this time, their daytime activities and other individual factors can have major effects on their sleeping patterns (Wolfson, 1996). Despite the importance of sleep during a child’s development and the fact that sleep is significantly affected by the changes during a child’s life, it is often ignored (Wolfson, 1996). This is alarming because without intervention, sleep disturbances may persist for years with negative consequences for the child (Pollock, 1992; Pollock, 1994; Kataria, Swanson, & Trevathan, 1987) and be extremely disruptive to family life (Durand & Mindell, 1990).

There have been many studies on the sleep habits and disturbances of infants, young children, and adolescents, but few studies have researched the same sleep issues in school-aged children. Even primary care providers or family general practitioners are generally aware of sleep issues in infants and toddlers, but often fail to recognise sleep problems in older children (Owens, Spirito, McGuinn, & Nobile, 2000).

Sleep disorders in children, specifically those classified as dyssomnias, include disorders that result in difficulties either initiating or maintaining sleep or disorders that involve excessive sleepiness. These are frequently reported in childhood (Owens, Palermo, & Rosen, 2002). Dyssomnias are divided into extrinsic disorders, caused by influences outside
of the body and intrinsic disorders, primarily caused by biological factors (American Sleep Disorders Association (ICSD), 1990; Owens, et al. 2002; Owens, et al., 2000). Following is a description of some of the extrinsic and intrinsic dyssomnias.

Extrinsic Dyssomnias

1. *Sleep onset association disorder*. This occurs when a child requires particular external conditions such as having television, radio, or lights on, or having a parent present to fall asleep at bedtime and after night wakings. Sleep onset is delayed when these objects or circumstances are absent, however, when present, sleep is normal.

2. *Limit-setting sleep disorder*. This is typically seen in children as bedtime resistance, e.g., stalling, refusing to go to bed. These sleep problems may occur when parents do not set and enforce a consistent bedtime.

3. *Adjustment sleep disorder*. An acute stress, conflict, or an environmental change may temporarily cause a child to have difficulty falling asleep or maintaining sleep. These characteristics are usually bedtime resistance and/or prolonged night wakings. This disorder is often associated with anxiety and/or night-time fears. The duration of the sleep problem is often only days, however, with ongoing stressors it may last as long as several months.

4. *Inadequate sleep hygiene*. These are sleep problems caused by habits that interfere with the initiation and/or maintenance of sleep, e.g. lack of bedtime routines and consistent schedules, watching television in bed.

Intrinsic Dyssomnias

- *Psychophysiological insomnia*. This is a conditioned anxiety response that a child develops as a result of previous difficulties in initiating and maintaining sleep. It is similar to an adjustment sleep disorder in that it is characteristic of bedtime resistance and/or prolonged awakenings. Wilson and Haynes (1985) define these characteristics further by describing some children presenting with somatic complaints, such as feeling sick.
Children also tend to report thinking about worries and ruminating on experiences past or in the future. It may also be situational specific in that the sleep difficulty may not be experienced when sleeping in different locations or may be reduced during times of less stress, for example, school holidays.

Childhood sleep disturbances that involve difficulty initiating and maintaining sleep can present as bedtime resistance, sleep onset delay, sleep anxiety, night wakings, and daytime sleepiness (Owens, et al., 2002; Owens, et al., 2000). Bedtime resistance can be characterised by a child falling asleep other than in their own bed, needing parental presence to fall asleep and refusal to go to bed at a set time. Sleep onset delay, is characterised as an inability to fall asleep within a reasonable amount of time, typically 15-30 minutes (Wilson & Haynes, 1985; Sheldon, 1996). When a child exhibits sleep anxiety, they usually need a parent in the room to fall asleep, they may be afraid of the dark, afraid of sleeping alone, and may have difficulty sleeping away from home. Prolonged night waking may be due to a child’s inability to return to sleep without assistance, moving to someone else’s bed, or they may wake more than once during the night. Daytime sleepiness is characterised by the child requiring to be woken in the morning, difficulties getting out of bed or taking a long time to become alert, appearing tired, and waking in a difficult mood.

Despite these recognised sleep disturbances and associated behaviour, some researchers have argued that whether to define particular sleep behaviour as a disturbance or problem is dependent on how the parent sees the situation (Stores, 1996; Owens, et al., 2000). The same sleep behaviour in some families may be considered a problem, while it is not problematic in other families. It is also the parent who determines whether to report the behaviour as a concern and seek assistance (Owens, et al., 2000).

*Prevalence*

The prevalence of sleep problems in school-age children varies between 24% and 43% (Kahn et al., 1989; Owens, et al., 2000; Stores & Wiggs, 1998). However, each child may
have more than one sleep problem. Waking at night (28%) and trouble falling asleep (23%) were rated by Salzarulo and Chevalier (1983) as third and fourth most likely to occur in their sample of 218 children aged 2-15 years old and referred for paediatric or child psychiatric consultation. Dollinger (1982) also found that 26% of children (aged 3-15 years) who were referred by their mothers to a university clinic had trouble falling asleep. However, he also found that 42% of the children experienced restless sleep and 42% presented with bedtime refusal, while 40% refused to go to sleep without a nightlight. Owens, et al., (2000), reported a prevalence rate for bedtime resistance as 15% in children aged 4-11 years. However, Blader, Koplewicz, Abikoff, and Foley (1997) found that 27% of 987 elementary school children (aged 5-12 years) had bedtime resistance and it was the most prevalent sleep complaint. They also reported 11.3% sleep-onset delays, 6.5% night waking, 17% morning wake-up problems, and 17% fatigue complaints. Of interest in these findings was that among the 11.3% of children with sleep-onset problems, 80% of these also displayed bedtime resistance and 34% of bedtime resisters also had onset problems. There appears to be a wide range in the reported prevalence rates of different sleep complaints therefore, it is difficult to provide accurate estimates of the prevalence of specific sleep problems in school-age children.

While many sleep problems are transitory, it is of concern that 43% of healthy preadolescents (aged 8-10 years), still experience sleep problems that last more than 6 months (Kahn, et al., 1989). This figure highlights the importance of intervening before the outcomes of sleep disturbances become chronic.

*Developmental Sleep Requirements*

(An overview of developmental sleep physiology is beyond the scope of this review. The reader is referred to Sheldon, 1996)

Individual differences in sleep requirements make it difficult to provide precise recommendations regarding the amount of sleep required for children to function well during the day. However, there are guidelines for typical sleep requirements, which reflect
developmental changes from childhood to adulthood. Ferber (1985) outlines these guidelines as infancy: 16 hours total sleep time; 2 years: 13 hours; 5 years: 11 hours; 9 years: 10 hours; 14 years: 9 hours and then young adult level of about 8 hours by 17 years of age. Unfortunately, many parents have unrealistic expectations or no knowledge at all, about how much sleep their child needs (Mindell, et al., 1999). Thus, they could be expecting that their child will sleep for longer periods than they need or fail to ensure sufficient sleep through lack of restriction and monitoring. This uncertainty may play a role in sleep disorders during childhood.

Factors that Contribute to the Development and Maintenance of Sleep Difficulties

A variety of factors are outlined by Wilson & Haynes (1985) as playing a role in the aetiology of dyssomnias.

1) Heightened physiological arousal. Higher arousal levels are often due to environmental or cognitive stimuli which create difficulties with sleep onset and maintenance.

2) Conditioning factors. Heightened arousal becomes a response to certain environmental cues. Parental attention to a child having difficulty sleeping can encourage behaviours that are incompatible with sleep initiation, as discussed later.

3) Poor sleep habits. These may be inconsistent bedtimes, sleeping in, and having stimuli within the room that are incompatible with sleep such as a television or radio on.

4) Cognitive activity. Thoughts that become chronic, worrisome, and uncontrollable can lead to a heightened arousal system which then disrupts sleep.

5) Daily stressors. Ruminating on daily events or sleeping difficulties can lead to heightened physiological arousal through cognitive activity.

6) Psychological characteristics, for example mild depression, chronic worry, or anxiety, can generate heightened arousal levels that are incompatible with sleep.

7) Pharmacological factors.
8) Medical and physical factors, for example, pain.

One of the main aetiological factors contributing to problematic sleep behaviours in children are the interactions between parents and their child at bedtimes. This can be explained by learning theory, which forms the basis for well-established interventions for children’s sleep problems (Owens, France, & Wiggs, 1999). France and Bl amplified (1993) described learning theory in relation to sleep difficulties in children in the following way. Sleep functions as a reinforcer. Children who have no difficulties with sleep are reinforced for appropriate bedtime behaviour by having quick onset of sleep and quality sleep. Similarly, parents are reinforced for using appropriate management of their child’s bedtime and sleeping behaviour, by their child’s sleeping.

When a child becomes distressed at any stage during ‘bedtime’, the distressed behaviour is aversive to the parent, who, as a result, attends to the child. The parents may provide attention, comfort the child, stay with the child until s/he sleeps, or bring the child into their bed. Therefore, the child is positively reinforced for becoming distressed. If any of these actions result in the child calming and going to sleep, the parent is negatively reinforced by the cessation of the child’s distress. Thus a behaviour trap or a coercion trap can occur. If the child demands attention or becomes distressed again, the parent will respond with the behaviour that stopped it before. The child will be more likely to become distressed as the parent responds to avoid the child’s distress. Both parent and child learn to anticipate each other’s behaviour and can begin to become distressed at earlier stages in the bedtime routine. The parent may avoid this aversive behaviour, for example, by going to bed with the child without the child becoming distressed at all. The child’s sleep occurs increasingly in the presence of parental attention so the child is negatively reinforced by avoiding the unfamiliar situation of falling asleep alone.

Some families engage in extensive rituals in order to avoid aversive behaviours at bedtime. This leads to the rituals eventually having to occur on a regular basis and becoming associated with ‘bedtime’. Thus according to learning theory, parents are seen as shaping and
maintaining 'bedtime' problems by using inappropriate stimulus control and reinforcement (France & Blampied, 1993).

At times, some parents realise their role in maintaining the sleep problems and attempt to withdraw their involvement. However, this results in an increase in the child's distress behaviour. This phenomenon is referred to as the Post-Extinction Response Burst (PERB) (France, Henderson, & Hudson, 1996). This increase in distress usually results in parents' renewal of avoidance behaviour, strengthening the coercion trap and reinforcing the child at an increased level of distress. Intermittent attempts to change make behaviour more resistant to change (France & Blampied, 1993). This is in accordance with learning theory: Behaviour which is intermittently reinforced, is more resistant to extinction than behaviour that is consistently reinforced.

In their survey of 987 children aged 5-12, Blader, et al., (1997) found that sleep onset problems were associated with several parent-mediated variables. These included the need for caregiver or parent reassurance or proximity, inconsistent bedtimes and children falling asleep away from their own bed. They were also linked to a lack of parental limit setting, anxiety, and unreasonable expectations of the child’s sleep requirements. Furthermore, Children who presented as having delayed sleep onset and bedtime resistance also tended to wake later worsening the problem (Blader, et al., 1997).

**Effects of Childhood Sleep Disturbance**

The impact of sleep disturbance on adults has been well researched. There has not been as much research on the impact of sleep disturbance on children but it is assumed that similar effects to those found in adults would be found in children also (Mindell, et al., 1999). In addition sleep deprivation (i.e., shortened sleep or lack of sleep) may occur with sleep onset delay. Even if sleep deprivation occurs on a limited scale, it can result in poorer performance in daytime activities, especially if it occurs on a regular basis (Mindell, et al., 1999). Limited sleep leads to daytime sleepiness. However, the effects of sleep loss on
individual children vary according to their developmental level, individual sensitivity to sleep
depression, motivational levels, setting, and environmental demands (Owens, et al., 2000).
Nevertheless, sleep deprivation in children has been shown to affect behaviour, cognitive
functioning, emotional regulation, and increased risk for psychopathology (Sadeh, Gruber, &
Raviv, 2002; Dahl, 1996).

Around 30-40% of young children with sleeping disturbances are reported to have
generalised behavioural difficulties (Kataria, et al., 1987; Stevenson, 1993; Richman, 1981; &
Valman, 1981). Sleeping disturbances may lead to behaviour problems or they may make pre-
existing difficulties worse (Sadeh, et al., 2002; Stores, 1996). Behavioural effects, for children
and adolescents, include tiredness or fatigue, irritability, hyperactivity, frustration,
distractibility, aggression, and poor acceptance of novelty (Stores, 1996, Sheldon, 1996; Hill,
1994).

Children displaying daytime sleepiness and the behavioural effects associated with
sleep disturbances may be considered a problem in the classroom (Mindell, 1993). In addition
to behavioural problems, cognitive functioning and performance are significantly impaired
(Owens, et al., 1999; Mindell, 1993; Mindell, et al., 1999). Cognitive effects include lack of
focused attention, poor vigilance and reaction time, poor memory, and reduced psychomotor
on a child being alert, attentive, and responsive during a learning situation (Sheldon, 1996).
Children who have sleeping difficulties may not be able to function at their full capacity in a
learning situation. As Kahn et al., (1989) reported, 21% of preadolescents who were poor
sleepers had failed one or more years of school.

Children with sleep disturbances not only exhibit behavioural difficulties, they are also
more likely to experience emotional problems. The prevalence of children with sleep
problems experiencing emotional problems is the same as that found for those with
behavioural difficulties, 30-40% (Kataria et al., 1987; Stevenson, 1993). These children
experience negative mood changes and a decreased ability to control their emotions (Hill,
Anxiety and depressive symptoms can also be an outcome of sleep disturbances and place the children at increased risk for psychopathology (Stores, 1996; Sadeh, et al., 2002; Owens, et al., 1999).

The problems resulting from a child’s sleep disturbances can not only have a significant impact on the child’s life but can disrupt many aspects of family life. Studies of young children who have chronic sleeping difficulties have described parents as suffering from sleep deprivation themselves, especially parents whose children night wake. This can result in parental fatigue, stress, dysphoria, and subsequent impairment of daytime functioning (Kuhn, Mayfield, & Kuhn, 1999; Mindell, et al., 1999; Durand & Mindell, 1990; & Owens-Stively, et al., 1997). It can also lead to difficulties in parenting ability. Quine (1992), found that mothers of children with learning disabilities and severe sleep problems showed greater irritability, loss of control, and increased use of physical punishment compared with mothers who had children with learning disabilities who were not disturbed at night (Stores, 1996). Parents are often “at the end of their rope” (p.15) because of their own disturbed sleep and because of their failed attempts to fix their child’s night-time problems (Durand & Mindell, 1990).

While the pressure on both parents is intense, studies have shown this is more so for the mothers. It is more likely to be the mother who attends to the child and primarily deals with the child’s behaviour, and therefore the effects of the child’s poor sleep on the mother are more pronounced (Richman, 1981; Seymour, 1987). Maternal complaints of physical and psychological health problems have been reported (Stores, 1996) with maternal depression symptomatology and increased anxiety being most common (Durand & Mindell, 1990). Studies with young children have shown that after parents have been taught strategies to effectively deal with their child’s sleep disturbance, there is an improvement reported in parents’ mood and emotional state (Mindell, et al., 1999; Stores, 1996), in particular a decrease in a maternal depression (Durand & Mindell, 1990).
Parents also report decreased marital satisfaction when they have a child with a sleep
disturbance (Durand & Mindell, 1990; Seymour, 1987). This is shown to be related to the
child’s sleep disturbance in that improvement in marital satisfaction was reported after
successful completion of a sleep intervention for the child (Mindell, et al., 1999; Durand &
Mindell, 1990). Any family tensions are likely to be intensified due to having a child with
sleep disturbance, for example, where parents disagree on which approach to use to remedy
the child’s behaviour (Stores, 1996). A combination of lack of confidence in parenting ability,
parental sleep deprivation, parental stress, possible maternal depressive symptomology, and
marital dissatisfaction would make family tension a likely result. In young children, it is
suggested that one-third of families who have a child with sleeping difficulties have
significant family disharmony (Richman, 1981; Valman, 1981).

Having a child with a chronic sleep disturbance can also affect the attachment between
parents and their child. Parents’ perceptions and responses to their child may be negative and
have detrimental consequences (Owens, et al., 2002). They may be more likely to perceive
their child’s overall behaviour in a negative light (Owens-Stively et al., 1997), be involved in
negative parent-child interactions (Kuhn, et al., 1999), and have less feeling of affection and
generally more negative attitudes towards their child (Stores, 1996).

*Sleep and Anxiety*

*Introduction*

Sleep problems and children’s emotional regulation are related (Hill,1994; Mindell, et
al., 1999; Dahl, 1996). However, the relationship between these appears to be systemic rather
than linear (Dahl, 1996; Sadeh, 1996; Sadeh & Gruber, 1998). While lack of sufficient sleep
can cause children to experience negative mood changes and a decreased ability to control
their emotions, difficulties with emotional regulation can lead to difficulties with initiating
and maintaining sleep. This is shown in that sleep problems are among the diagnostic criteria
for several emotional disorders such as affective disorders, posttraumatic-stress disorder, and
anxiety disorders as displayed on Table 1. In examining the effects of having a generalised anxiety disorder, for example, the diagnostic criteria also include an inability to relax, heart pounding or racing, rumination, difficulty in concentration, and irritability. This state of high arousal is incompatible with sleep (Dahl, 1996).

Anxiety in children is often experienced as fear of an unknown danger. At bedtime fear of the dark is the most likely displacement for these anxieties (Simonds & Parraga, 1984). These fears and anxieties are often common in childhood, but at bedtime, when a child is left alone, separated from parents, and free from distractions, the child is left to deal with the dark and their thoughts and imagination (Ferber, 1990). Consequently, at bedtime, fears and anxieties can become exaggerated. Because of this, children may refuse to enter their rooms, become very distressed, demand to have a parent present while they sleep, or require the use of night-lights to ward off the dark (Owens, et al., 1999). This is a common part of normal development (Gordon & King, 2002) and is normally short-lived, but in some cases these fears and child’s expectations can persist and become chronic and severe (Owens, et al., 1999, Muris, Merckelbach, Ollendick, King, & Bogie, 2001).
Table 1

*DSM-IV clinical anxiety and depression disorders, diagnostic criteria and features involving night-time symptomatology in children.*

<table>
<thead>
<tr>
<th>DSM-IV Clinical Anxiety and Depression Disorders</th>
<th>DSM-IV Diagnostic criteria involving night-time symptomatology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separation Anxiety Disorder</td>
<td>Persistent reluctance or refusal to go to sleep without being near a major attachment figure or refusal to sleep away from home. May also have repeated nightmares involving theme of separation (p.125).</td>
</tr>
<tr>
<td>Specific Phobia</td>
<td>Marked and persistent fear that is excessive or unreasonable, cued by the presence or anticipation of a specific object or situation, e.g., fear of the dark; exposure to the phobic stimulus provokes an anxiety attack or panic attack; in children, the anxiety may be expressed by crying, tantrums, freezing, or clinging (p.449).</td>
</tr>
<tr>
<td>Posttraumatic Stress Disorder</td>
<td>The traumatic event may be persistently re-experienced in recurrent distressing dreams of the event (in children, there may be frightening dreams without recognisable content); difficulty falling or staying asleep (p. 467).</td>
</tr>
<tr>
<td>Acute Stress Disorder</td>
<td>The traumatic event may be persistently re-experienced in recurrent dreams; difficulty going to sleep (p. 471).</td>
</tr>
<tr>
<td>Generalised Anxiety Disorder</td>
<td>Excessive anxiety and worry may be associated with sleep disturbance (difficulty falling or staying asleep) or restless unsatisfying sleep (p.476).</td>
</tr>
<tr>
<td>Major Depressive Disorder</td>
<td>Insomnia or hypersonnia nearly every day (p. 376)</td>
</tr>
<tr>
<td>Dysthymic Disorder</td>
<td>Insomnia or hypersonnia (p.380)</td>
</tr>
</tbody>
</table>

*Note: Page numbers refer to American Psychological Association, 2000 (1994; Gordon & King, 2002).*
Prevalence

The literature addressing prevalence rates for co-morbid sleep and anxiety disorders in children is very limited. Blader et al., (1997) found in a sample of 987 families that 1% of children aged 5-12 were reported by their parents to have co-existing sleep problems and anxiety. In contrast, Kataria et al., (1987) and Stevenson, (1993) reported a rate of 30-40% of children with sleeping problems also exhibited co-existing emotional problems. However, higher prevalence rates have been reported for night-time fears. Muris et al., (2001) found 73.3% of 176 school children aged 4-12 years, reported night-time fears. Of these fears, 23.3% feared intruders; 16.5% had a fear of imaginary creatures; 12.5% experienced frightening dreams; 9.1% were afraid of environmental threats (e.g., dark, thunder, storms); 7.4% feared animals; and 4.5% had frightening thoughts (e.g., worrying about personal health and worrying about parents dying). These fears were more frequent in 7-9 year olds but reached a plateau and became stable over 10-12 year olds. Night-time fears were associated with moderate levels of anxiety. Eleven point three percent of the 176 school children, displayed DSM III-R (Diagnostic and Statistical Manual of Mental Disorders, American Psychological Association, 1987) anxiety disorders that could be related to their night-time fears e.g., separation anxiety disorder (6.3%), and overanxious disorder (4.4%).

Factors that Contribute to the Development and Maintenance of Sleep Difficulties and Anxiety

There are two main factors in the aetiology of sleep disturbances in children who are anxious: Behavioural avoidance and heightened physiological arousal. Sleep disorders such as inadequate sleep hygiene, limit-setting sleep disorder, and sleep onset association disorder often develop as a result of a child experiencing recurrent anxiety symptoms (Garland, 2001). Children who have anxiety problems often dread bedtime because they know that they will have difficulty getting to sleep and will be lying in bed worrying about daytime problems, or experience somatic symptoms, or fears of the dark. Consequently, bedtime resistance or the
need for parental presence at bed time can result from extreme problems in the child’s attempt to avoid feared stimuli and the consequential physiological arousal (Garland, 2001). This heightened physiological arousal can also interfere with the onset of sleep and contribute to frequent and prolonged night wakings. Psychophysiological insomnia can be a primary sleep disorder in children with anxiety symptoms. However, due to the aversive nature of anxiety and the use of instinctive avoidance behaviours in order to reduce the experience of the accompanying physiological arousal, extrinsic sleep disorders can co-exist with an intrinsic disorder such as psychophysiological insomnia (Garland, 2001). A further complicating factor is that sleep deprivation, resulting from the physiological arousal and behavioural avoidance of anxiety, exacerbates anxiety symptoms further and ends up having a cyclic nature in the continuation and increasing severity of sleep disturbance and anxiety (Garland, 2001).

Children who experience anxiety often have a variety of cognitive biases and distortions. These have been found to exist before the development of anxiety disorders and also contribute significantly to the development of anxiety (Vasey & Dadds, 2001). Short, Barrett, Dadds, and Fox (2001) found that children with anxiety tend to have more threatening interpretations of ambiguous situations than children with no anxiety. They also chose more avoidant solutions to the ambiguous situations. Muris et al., (2001) demonstrated this in the coping behaviours that were used by 176 typical school children when they were afraid at night. These were: seeking support from parents 44.2% (e.g., calling parents, getting them to sit close by); avoidance 29.5% (e.g., staying up later); distraction 27.1%, (e.g., starting reading a book); trying to sleep 24%, (e.g., try to go to sleep straight away); active control 11.6%, (e.g., checking their room to see if someone is there); clinging to stuffed animals 5.4%, (e.g., hugging their teddy bear). They found that children reported to have night-time fears, relied on more coping strategies than children without night-time fears, however the coping strategies they used were less effective ones e.g., (seeking support from parents or avoidance).
King, Ollendick, and Tonge (1997) note that an additional factor for children who have these experiences is that they come to lack confidence in their ability to handle the fearful night-time situations. This is further strengthened with any exposure to night-time situations that result in panic and humiliation. By involving parents in attempts to cope with the fear, children experience further feelings of inadequacy and poor self-confidence, and avoidance of future challenges (Dadds, Barrett, Rapee, & Ryan, 1996).

Many factors contribute to the significant role the family plays in both sleep and anxiety problems in children. There is some evidence suggesting a genetic component to the development of anxious temperament and vulnerability to anxiety disorders in children (Garland, 2001). Children may also learn from parental modelling of fear and avoidance behaviours (Dadds & Roth, 2001). The development of anxiety in children has also been associated with high parental control and low levels of secure attachment, that is anxious children usually have an enmeshed relationship with anxious parents (Dadds & Roth, 2001; Garland, 2001). Parents may also be overprotective of their child and limit opportunities for the child to be exposed to feared stimuli, thereby not allowing their child to practice coping strategies or experience success at controlling aspects of the environment (Vasey & Dadds, 2001). Inadvertent reinforcement and encouragement of a child’s anxious behaviour and avoidance by parents plays a significant role (Vasey & Dadds, 2001). Parents often unintentionally reinforce a child’s difficulty settling to bed, or prolonged night wakings due to anxiety, by providing attention and comfort and/or allowing the child to avoid dealing with their fear by staying with them, or allowing them to sleep in the parent’s bed (Garland, 2001; Gordon & King, 2002; Wilson & Haynes, 1985). Being able to sleep in the parent’s bed is a highly reinforcing activity for children (Gordon & King, 2002). This cycle leads to the maintenance and possible escalation of the child’s anxieties and sleep problem.

White (1985) describes the involvement of the family in the survival and growth of fears in children as being dependent upon a “fears life support system” (p.29) within the family. Parents typically respond to a child’s experience of fears by becoming more actively
involved in the child’s life and taking steps to ensure the child’s security. For example, parents who have a child with night fears may engage in a nightly routine of checking under the bed and in the cupboards for noises, or walking outside to check for intruder’s. In doing this, parents emphasise their ability to protect the child from their fears in order to lessen the child’s experience of anxiety. As a result, the child learns to rely more heavily on the parent and, as previously mentioned, this limits the development of autonomy, courage, and positive self-efficacy (White, 1985; Vasey & Dadds, 2001; Krohne & Hock, 1991).

Other factors involved in the development of sleep difficulties due to anxieties or fears, may simply be due to an inappropriately early bedtime, that is a child who is put to bed two hours before their natural time of sleep onset may use the time for thought, imagination, or fantasy and end up scaring themselves. When the bedtime is adjusted to coincide with the usual time of sleep onset, such fears disappear immediately (Ferber, 1996). These fears may disguise what might only be a common extrinsic sleep problem. For example, parents may focus on the expressed fears and not realise that sleep onset is delayed (Wilson & Haynes, 1985). On the other hand, a child may not have any real fears, but use the complaint of fears as a stalling tactic (Ferber, 1996).

Risk of the Development of Depression

The link between sleep disturbances or deprivation and mood regulation is an important one, especially as it may be a primary step in the aetiological process of later depression (Dahl, 1996). However, the link between sleep disturbances and depression involves many complex processes and many aspects are not yet well understood. What research has shown so far is that emotional distress can interfere with sleep, causing sleep deprivation. Sleep deprivation then produces clinically significant impairments in mood and motivation (Garland, 2001; Dahl & Lewin, 2001). A large amount of research also indicates that children and adolescents with emotional disorders, such as major depression, report high rates of sleep disturbance. For example, Ryan, et al., (1987) found that 75% of children and
adolescents with Major Depressive Disorder reported experiencing insomnia. There is now initial evidence that suggests that sleep problems during the first twenty years of an individual's life can predict the development of mood disturbances and disorders in early adulthood (Ford & Kammerow, 1989; Rao, et al., 1996; Johnson, Chilcoat, & Breslau, 2000).

Ford and Kammerow (1989) found that adults with chronic insomnia had significantly higher rates of major depression and anxiety disorders. From this, Van Moffaert (1994) drew at least two hypotheses: there may be a common pathology which underlies both sleep disturbances and depression; sleep problems are an integral part of depression and probably a prior indicator of it. Garland (2001) indicated that the development of a depressive disorder occurs in about one-half of anxious children with sleep problems. Johnson, et al., (2000) found that there was a greater association between sleep and depression at age 11 than at age 6 when they conducted a cross-sectional and prospective study of 823 children: Parental reports on the Child Behaviour Checklist were obtained at age 6 and then again at age 11 years. This pattern suggests that the overlap between sleep problems and depression may strengthen over time. Gregory and O'Connor (2002) conducted a longitudinal study also using the Child Behaviour Checklist, and assessed 490 children over the ages of 4-15 years. They found that sleep problems at 4 years of age significantly predicted depression occurring in mid-adolescence. The association between sleep and depression increased with age and therefore offers evidence that the overlap between sleep problems and depression is moderated by development.

Anxiety symptoms are common among children with major depression (Dahl & Lewin, 2001). The DSM-IV-TR (American Psychological Association, 2000) states that anxiety frequently co-occurs with mood disorders. Anxiety symptoms in childhood appear to carry, or signal, significant risk for other disorders, particularly anxiety disorders, dysthymia, and depression (Dahl & Lewin, 2001). Cole, et al. (1998) assessed elementary school children for anxiety and depressive symptoms over a period of three years. They found results that
supported the hypothesis that anxiety leads to depression in children and adolescents and sleep.

Intervening early to address sleep and/or anxiety problems might prevent the development of depression in at least some children (Dahl & Lewin, 2001). Ford and Kammerow (1989) found that the risk of developing depression in adults with insomnia was reduced if the insomnia had been resolved within the year that they were assessed for sleep problems.

One of the main limitations of research on the connection between sleep and depression is in the design, that is, most studies are cross-sectional with limited conclusions and, therefore, can not make any causal links. Longitudinal studies need to be conducted before any real conclusions can be drawn about this connection (Van Moffaert, 1994). Van Moffaert suggests that research should also be aimed at determining whether early recognition and treatment of sleep disturbances can prevent future development of depressive disorder.

*Interventions for Sleep and Anxiety in School-Aged Children*

Behavioural interventions are often taught to parents so they can alleviate their child’s sleep disturbances. This is in part due to the role that parents play in the development and maintenance of sleeping difficulties. Both the parents and their child have to learn new behaviours to facilitate better child sleep (Owens, et al., 2002). There is no literature examining interventions for children with both sleep and anxiety. The closest research is in the area of children with night-time fears. The interventions for children with night-time fears and the supporting literature will be described. However, while providing intervention for the child’s anxiety at night, these interventions do not examine the co-occurrence of sleep disturbances. Interventions for typically developing children with sleep disorders have largely been researched with young infants and preschoolers. Therefore, these interventions will only be described briefly.
Interventions for Night-time Anxiety

Relaxation training and pleasant imagery. This provides the child with a way of reversing the effects of physiological arousal associated with the anxiety or fears (Gordon & King, 2002). Relaxation scripts teach the child skills to relax his/her muscles and tension at bedtime and can create distraction from worries (Garland, 2001). Parents can also be involved in training their anxious child in the use of relaxation (Owens, et al., 2002; Gordon & King, 2002).

Positive Reinforcement. Children are rewarded for appropriate bedtime behaviours, and dealing with their anxiety and/or becoming less afraid. This may be with a prize in the morning, a star on a chart or accumulated points for ‘bravery’, as in a token economy system (Garland, 2001).

Systematic desensitisation. Anxious night-time behaviour is reduced by systematically and gradually pairing anxiety related thoughts or stimuli with muscle relaxation or pleasant imagery (Owens et al., 2002). This procedure can present difficulties for children, therefore, Lazarus and Abramovitz (1962) developed a variant of systematic desensitisation known as emotive imagery. This procedure produces a positive emotional state by using the child’s hero images in a narrative or story format. The therapist then gradually introduces the fear-eliciting stimuli to the child (Gordon & King, 2002). This intervention has possible efficacy according to Chambless and Hollen’s (1998) criteria for assessing the strength of researched evidence for psychological interventions.

Jackson and King (1981) used emotive imagery with a 5 1/2-year old boy who had fears of the dark, noises and shadows. This caused sleepless nights every night, which were heightened by the break in of an intruder. An anxiety hierarchy was constructed and the hero character ‘Batman’ was chosen to incorporate into a story where Batman and the child worked together to accomplish each step in the hierarchy. This occurred over four sessions and at the completion, the boy was free from fear episodes and was sleeping soundly through the night. Follow-ups at 1, 2, and 3 months revealed no fear episodes and at 15 and 18 months
treatment gains were still maintained. King, Cranstoun, and Josephs (1989) used a multiple baseline design across participants to further examine the effectiveness of emotive imagery. Three children, aged 6, 8, and 11 years old, who displayed night-time fears, showed behavioural improvements when tested for duration of darkness tolerance, which was conducted every second night. Each child’s hero and interests were created into a stories for use in working through an anxiety hierarchy, designed for each child. Six to thirteen sessions were administered (30 minutes per session). Two of the three children showed marked behavioural improvements and were able to sleep by themselves at night. The child who slept most frequently with his mother did not show any improvement in night-time behaviour. A more recent study by Cornwall, Spence, and Schotte (1996) used a waiting-list control group as part of their experimental design in examining emotive imagery for 24 children aged 7-10 years with darkness phobia. There were six intervention sessions, one per week. Imagery scripts involved fear hierarchy situations relating to darkness and featuring the children’s favourite superhero characters. Assessments were conducted before, after, and at a three-month follow-up. The emotive imagery group had a significantly greater reduction in darkness fears and anxiety according to child and parental reports, and a darkness task, compared with the waiting-list group. Improvements were maintained at follow-up. These results strengthen the empirical support for emotive imagery as an effective intervention for night fears, however, further evaluation is still required.

Cognitive strategies. These involve teaching the child self-control strategies by using positive self-statements, such as, ‘I am a brave boy. I can take care of myself in the dark’. Children are then told to practice these each night and to use them whenever they feel afraid. Parents are also informed of the necessity of their involvement in helping their child accomplish the task (Owens, et al., 2002; Gordon & King, 2002, Graziano, Mooney, Huber, & Ignasiak, 1979).

Kanfer, Newman, and Karoly (1975) trained children in the use of verbal, controlling responses for darkness tolerance. Forty-five children, 5-6 years old, were assigned to one of
three groups. Each group rehearsed one of three sentences: a) sentences emphasising the child’s active control or competence, e.g., “I am a brave boy. I can take care of myself in the dark”; b) sentences concentrating on reducing the aversive nature of the stimulus situation by emphasising the fear stimulus, e.g., ‘The dark is a fun place to be. There are many good things about the dark’; c) neutral sentences, e.g., ‘Mary had a little lamb. It’s fleece was white as snow’. In the darkness tolerance tests, the competence group was generally superior to the stimulus and neutral verbalisation groups.

Many studies use a combination of intervention strategies for children with night-time fears. Graziano et al. (1979) and Graziano and Mooney (1980, 1982) conducted a series of studies on the efficacy of a cognitive behaviourial treatment programme for children’s night time fears. Graziano and Mooney (1980) used a waiting-list control group to evaluate their treatment programme. They gave parents of 33 primary school-aged children direct instruction in the treatment of severe night-time fears. Parents supervised, monitored, and rewarded efforts with praise and bravery tokens. Children practised and self-monitored nightly self-control exercises: a) muscle relaxation, b) imagining a pleasant scene, and c) reciting brave self-statements. They used a behavioural criterion for treatment success of ten consecutive fearless nights. At the end of the three week intervention phase the treatment group showed less night-time fear, improvements on the number of minutes to sleep onset, self-reported willingness to go to bed, and reduction in the proportion of days that delay tactics were used, than the control group. At a one-year follow-up, only one of seventeen children in the experimental group failed to meet ten consecutive fearless nights. Maintenance of improvements was noted in nearly all children at a two and a half to three-year follow-up.

A study by McMenamy and Katz (1989) had five children, aged 4-5 years old, and their parents participate in a multiple baseline design across participants. Children were taught relaxation skills, pleasant imagery, and self-instructions to reduce anxiety. Parents positively reinforced compliance and reduction in the child’s fear behaviour over a 3-week intervention. Reductions in fearful behaviour occurred in all five children with increased improvements
found at follow-up. Reductions in ratings at the Child Behaviour Checklist over post intervention and follow-up suggested that the benefits of the intervention generalised to other behavioural difficulties that parents had rated as problems.

While cognitive-behavioural interventions appear effective, a couple of methodological issues have been raised (Gordon & King, 2002). The first issue is the use of the combination of behavioural strategies such as relaxation and reinforcement with cognitive self-instruction. This makes it difficult to identify aspects of the intervention that are most effective. Ollendick, Hagopian, and Huntzinger (1991) addressed this issue. Using a multiple baseline across participants with two girls, aged 8 and 10 years old who displayed night-time problems and had a diagnosis of separation anxiety disorder. They used two intervention phases: self-control training alone, which incorporated relaxation, self-monitoring, and verbal self-instruction; and self-control training plus contingent reinforcement, where reinforcement for complete nights spent in their own beds was added. Fears were markedly reduced in both girls and they were sleeping in their own beds. These improvements were maintained at a 2 year follow-up. Ollendick et al., found that the introduction of the reinforcement schedule significantly increased the slight improvements made with self-control training on its own. These results indicate the effectiveness of contingent reinforcement in the treatment of children with night-time fears.

The second methodological issue was that controls had only been wait-listed and were not placebo controls. Waiting-list controls do not account for the effects of placement within a treatment, expectations for change, or therapist contact. Friedman and Ollendick (1989) attempted to address this issue. They used a multiple baseline design across participants with six children aged 7-10 years and implemented a placebo treatment session for children on extended baselines to control for reactivity to the demands associated with starting treatment. Their treatment package used a combined approach of relaxation, cognitive self-control, and reinforcement strategies. The children received “bravery tokens” for successfully using the self-control techniques at bedtime. Results showed that five of the six children had reduced
disruptive bedtime behaviours. Despite this, the extended baselines revealed that improvement in children’s behaviour began before the implementation of the intervention and appeared to be related to variables other than the specific treatment.

As these two methodological issues have not been fully addressed, further research is still required.

Paradoxical intention. Informing the child that they should try and stay awake, reduces the child’s anxiety related to sleep and takes away the pressure of having to fall asleep (Owens, et al., 2002; Epston, 1986).

In a review of behavioural and cognitive-behavioural interventions for sleep disorders, Owens, et al., (1999) stated that using self-control strategies such as relaxation training, guided imagery, and positive self-statements is well established as a successful intervention in treating night-time fears. Adding rewards for successfully completing tasks seems to improve outcomes even more.

Interventions for Sleep Disorders

Extinction / graduated extinction. This intervention process involves behavioural extinction. Parental attention is removed due to its reinforcing qualities and maintenance of bedtime misbehaviour and therefore continuing to disrupt the child’s sleep. Three forms of extinction are used. Standard extinction requires the parent to ignore all child crying and misbehaviour once the child is put to bed. Graduated extinction requires the child to fall asleep without the presence of the parent, but has the parents make scheduled checks on the child that gradually decrease in frequency. Extinction with parental presence involves having the parent in the child’s room, feigning sleep and remaining there until the intense first week of the extinction programme is completed (Owens, et al., 2002; Owens, et al., 1999; Ferber, 1990). Extinction is a well-established intervention for sleep problems with young children according to Chambless and Hollon’s (1998) criteria for assessing the strength of evidence for psychological interventions (Mindell, 1999). A limitation with the use of the various forms of
extinction is that it is often difficult for parents to accept the importance of ignoring the child, however this is a primary intervention for children with sleep-onset association disorder.

Scheduled awakening. This involves waking a child 15-30 minutes before they would normally wake at night and allowing the child to resettle as usual, thereby altering the sleep staging (Owens, et al., 2002). This intervention is seen as probably efficacious for young children according to Chambless and Hollon's criteria (Chambless & Hollon, 1998; Mindell, 1999). It is most often used for children who have regular night waking.

Positive bedtime routines. This intervention develops a relaxing routine that a child can learn to associate with bedtime (Owens, et al., 2002). It had been considered as a promising intervention for young children according to Chambless and Hollon's criteria (Mindell, 1999). This intervention can be used with both sleep-onset association disorders and limit-setting disorders.

Bedtime fading. This strategy involves rescheduling bedtime to a later time when sleep onset is more likely to occur quickly. The bedtime is then brought forward to successively earlier times, by a fixed amount, until the desired bedtime is achieved (Owens, et al., 2002). This is an intervention used with sleep-onset association disorders.

Positive reinforcement. Desired sleep behaviours are systematically rewarded such as settling into bed quickly and sleeping through the night. Children aged over 3 years may benefit from positive reinforcement, (e.g., social praise, stickers, points) (Owens, et al., 2002; Ferber, 1996). This intervention strategy has been used in the treatment of sleep-onset association disorder and limit-setting disorder.

Response Cost. Based on the principle that keeping the child awake is aversive, parents are instructed to remove the child from bed for a specified time if the child fails to fall asleep within an appropriate sleep onset time (Owens, et al., 2002). This is an intervention used with children with sleep-onset association disorder.

Parent education, advice, and support. Parents are provided with education about normal sleep behaviours, appropriate sleep requirements, good sleep hygiene, and taught the
use of behavioural strategies that they can use to remedy their child’s sleep problems (Owens, et al., 2002). This parental education is important in the intervention of children with sleep-onset association disorders and limit-setting disorders.

_Sleep hygiene._ Each aspect of inadequate sleep hygiene must be altered. Education around appropriate sleep hygiene should be provided and correction of hygiene errors, for example, having appropriate schedules and bedtime routines, and removing stimuli that is incompatible with sleep (Ferber, 1990).

_Stimulus control._ This involves having appropriate cues for sleep onset. This is achieved by having pre-bedtime routines, set bedtimes, and sleeping only in one fixed place (Owens, et al., 1999). Gordon and King (2002) suggest that activities in the bed should be restricted to sleeping only, thereby minimising the amount of time in bed awake. This helps to strengthen the association between sleep and the stimulus conditions under which it typically occurs. This intervention is used in the treatment of psychophysiological insomnia.

_Sleep restriction._ The amount of time the child spends in bed is decreased to the amount of actual or estimated sleep time. This amount is then gradually increased until the desired amount of sleep is achieved (Owens, et al., 2002). This technique can be used to treat psychophysiological insomnia.

**Factors Influencing the Outcome of Behavioural Interventions**

In order for behavioural interventions to be successful, it is necessary to have parental compliance as behavioural interventions need to be consistently applied to be effective. Some of the reasons that parents have difficulty complying with programmes have been outlined by Owens, et al., (2002).

- Parental exhaustion or sleep deprivation. Dealing with a child’s sleep disturbance, as noted previously, can leave parents deprived of sleep. When this is an ongoing feature parents can lack the mental and physical energy to carry through programmes such as extinction especially when dealing with increased sleep behavioural difficulties from their
child due to the post extinction response burst. For example, the parent may fall asleep in their child’s room during a graduated extinction intervention. However standard extinction works very quickly (taking only a few nights) and may overcome this issue.

- Parental depression or other mental illness. As discussed previously parent’s sleep disturbance and maternal depression are often linked. The mother’s ability to carry out the often specific consequences of an intervention may be compromised while in this emotional state.

- Lack of parental acceptance of the treatment plan. For parents to initiate and maintain an intervention programme they need to be accepting of the requirements. This is often an issue with interventions that involve extinction which involve ignoring the child. Parents may agree with the rationale for using the method but find it hard to implement because they feel they are being too harsh or harmful towards their child.

- Lack of parental understanding of aspects of the treatment plan. Although parents have the best of intentions, they may fail to apply aspects of the intervention plan or may apply them inappropriately. This can occur when parents have a lack of understanding about how specific strategies are to be implemented or do not understand the importance of specific aspects. This may reflect a lack of adequate therapist support. For example, if parents fail to understand the importance of consistent application of behavioural strategies and apply them inconsistently, it can lead to no improvement, or worse, it can lead to exacerbating the original behavioural problem.

Other factors that may influence the outcome of behavioural interventions are characteristics of the home environment (e.g., living arrangements, shared bedrooms), and competing demands on parents such as caring for other children or job-related duties.

_Rationale for Current Study_

There appears to be more research on the effects of sleep deprivation on school-aged children than there is on interventions to prevent it. The effects of sleep deprivation are all
encompassing in a child’s life and include impairments in their cognitive, emotional and behavioural abilities, as well as the risk of a decline in family functioning.

A relationship between sleep and anxiety has been often discussed and is clinically accepted, to the extent that sleep difficulties have become part of the diagnostic criteria for anxiety disorders in the DSM-IV-TR (2000). However, there is little empirical research to support this relationship, especially within the primary school age group. Interventions for children with anxiety do not incorporate the important issue addressing compounding sleep disturbances.

Without intervention, sleep disturbances can persist for years with many negative consequences (Pollock, 1992; Pollock, 1994). A similar pathway occurs for children with untreated anxiety. Both of these problems have also been linked with the development of depression (Dahl, 1996, Garland, 2001).

The aim of this study is to provide an intervention for families that will help school-aged children develop better sleep habits, learn how to alleviate their anxiety at night, and possibly reduce the risk of developing depression. This will be done using a behavioural family intervention.

This study has three hypotheses:

*Hypothesis 1*

The first hypothesis is that an initial relationship between sleep and anxiety will be found. This is a preliminary study and the sleep-anxiety relationship will be examined by determining if children have both sleep disturbances and anxiety that are displayed at night. More specifically, positive effects of providing an intervention that is primarily for sleep disturbances, on the level of anxiety, may indicate a relationship. That is anxiety levels should reduce with improved sleep behaviours.
Hypothesis 2

The second hypothesis follows on from the first in that the use of a behavioural family intervention will be effective in reducing both sleep problem behaviours and the child’s level of anxiety.

Hypothesis 3

The last hypothesis is that a coexistence of depression with children presenting in this way will be found.
CHAPTER 2

General Method

This method is divided into two sections. The first section describes the general procedure used for all participants. The following section details the specific procedures for each participant.

Experimental Design

To examine the effects of a behavioural family intervention on sleep and anxiety, a multiple baseline across participants design was used. Multiple baseline designs are the preferred method when conducting applied clinical research in cases where withdrawals and reversals of the experimental phases are not feasible (Barlow & Hersen, 1984). In a multiple baseline design across participants, an intervention is applied sequentially to the same behaviours across different, but matched participants by manipulating the length of baseline. The intervention is seen as effective when a change is observed in the rate of the behaviour and the same change is not observed in other participants until the intervention is introduced to them (Barlow & Hersen, 1984).

Participants

This study was approved by the University of Canterbury Ethics Committee (see Appendix 1 for a copy of letter).

Advertisements placed in local Christchurch radio, television and newspapers invited families with a school-aged child who was experiencing ‘sleep problems due to worries at night’ to participate in a research project providing intervention. Twelve inquiries for further information were made. Those inquiring were interviewed by telephone to ascertain their eligibility for the study. Families were given an information sheet that described, in detail, the purpose of this study, the basis for intervention, and the nature of their involvement if they
and their child consented (see Appendix 2 for copies of the Information Sheet and Consent Forms). The intervention was provided at no charge to the families.

From these 12 enquiring, 9 participants were chosen as most suitable for the study. Three families were not eligible because the child was either outside the age range or they had a primary sleep disorder without the presence of anxiety. These families were advised to approach their General Practitioner for a referral to the Family Mental Health Service. The criteria for participant selection were: written voluntary consent to participate by parent and child, child 5-12 years of age, no serious developmental, medical, or psychological problems, and displaying one or more of the following sleep behaviours.

1. Unwilling or unable to sleep in their own bed, without a parent being present, with all sources of light (other than a night light) and noise turned off for the whole night (Referred to as: ‘Parental Presence’).

2. Unwilling or unable to go to bed without arguing, complaining, or otherwise delaying bedtime (Referred to as ‘Bedtime Resistance’).

3. Unwilling or unable to go to sleep within approximately 20 minutes without being restless in bed, calling out for parents, wandering, or leaving the bed, except to go to the toilet (Referred to as: ‘Delayed Sleep Onset’).

4. Anxiety contributing to sleep difficulties, for example night fears, worries from the day or about future events (Referred to as: ‘Anxiety’).

5. Unwilling or unable to return to sleep, after waking during the night, without assistance, moving to someone else’s bed, or waking more than once during the night (Referred to as: ‘Night Waking’).

These selection criteria were based on similar selection criteria used by Graziano et al. (1979), Graziano and Mooney (1980), and Friedman and Ollendick (1989).

One or more of these behaviours were required to occur at least 2-3 times a week and to have been present for over three months. These frequency and duration criteria were established to provide a clear baseline for intervention strategies for behaviour change in the
study. In addition, sleep behaviours that were described as problematic by parents were also considered as part of the selection criteria (Owens, et al., 2000).

Of the nine children who met the selection criteria, two families discontinued due to personal difficulties and two children were discontinued due to recovery of normal sleep behaviours during the assessment process. Therefore, there were five participants in the present study.

Three of the participants were female and two were male. The children ranged in age from 8 years, 7 months to 11 years, 6 months. They all displayed a variety of sleep problems. All of the participants exhibited bedtime resistance, sleep onset delay, parental presence at bedtime, and anxiety. Four of the participants displayed night-time waking. Two participants were described as having had sleep difficulties since birth. Two had had sleep difficulties for 5 years and one for 3-4 years. Four of the participating families had two children and one family had five children. Two children were the eldest in their family, one was a twin, one was the second youngest, and one the youngest. One child was New Zealand Maori, the other participants were New Zealand European. The socio-economic status (SES) of the participants varied. Two families had an average score of 2.5, one family 3.5, one family 5.5, and one family 6, with 1 being the highest and 6 being the lowest SES level on the Elley-Irving Socio-Economic Index (Elley & Irving, in press). In four of the families, both parents participated in the programme, in the other, the mother was the sole adult participant. Refer to Table 2 for an outline. (Table 2; Pseudonyms have been given for each child to maintain anonymity). Each participant was seen in their own home.
Table 2

Sleep Characteristics of Participants

<table>
<thead>
<tr>
<th>Child</th>
<th>Gender</th>
<th>Age (Yrs.Mo)</th>
<th>Sleep Behaviours*</th>
<th>Sleep Difficulty Duration</th>
</tr>
</thead>
</table>
| 1 Cherin | Girl | 9.1 | Bedtime resistance  
Sleep onset delay  
Parental presence  
Anxiety | 5 years |
| 2 Jasmine | Girl | 8.7 | Bedtime resistance  
Sleep onset delay  
Night waking  
Parental presence  
Anxiety | Since birth |
| 3 David | Boy | 9.6 | Bedtime resistance  
Sleep onset delay  
Night waking  
Parental presence  
Anxiety | 5 years |
| 4 Louise | Girl | 10.2 | Bedtime resistance  
Sleep onset delay  
Night waking  
Parental presence  
Anxiety | 3-4 years |
| 5 Shane | Boy | 11.6 | Bedtime resistance  
Sleep onset delay  
Night waking  
Parental presence  
Anxiety | Since birth |

* See text for complete description

General Procedure

Baseline Interview and Assessment

The baseline involved the collection of intake data and the recording of sleep patterns by parents. The intake data collected consisted of an assessment interview with both parents
(if applicable), and the child. The child was further interviewed and assessed on a later occasion. The assessment interview with the parents covered topics such as presenting problem, history of presenting problem, developmental history, and the presence of other family problems. The child assessment interview covered the children’s understanding of their problems and how and when they began. It also covered their views on school, home, other contexts they were involved in, and people they were involved with (See Appendix 3 for a list of interview questions).

The researcher asked each parent to complete a Child Behaviour Checklist (CBCL; Achenbach & Edelbrock, 1991) and the child participant was administered the State-Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973) and the Children’s Depression Inventory – Short Form (CDI-S; Kovacs, 1992).

This information was used to plan individual interventions for each child and their family.

Participant Matching

The participants were matched by age as closely as possible, and divided into two groups to ease the implementation of the programme. This meant that the baseline length could be varied between the two groups to provide shorter waiting periods for some of the families. Group 1 contained the three younger participants while Group 2 had the two older participants.

Baseline Monitoring

The parents and the child recorded information each night about the child’s current sleep patterns and sleep problems. The information was recorded in a notebook to form a ‘sleep diary’, as described in the following section.

The length of baseline monitoring for each participant was randomly assigned to avoid bias and meet the criteria for a multiple baseline design. Group 1 participants were assigned baseline lengths of 5, 10, and 15 consecutive days. Group 2 participants were assigned
baseline lengths of 1, 2, and 3 consecutive weeks. Following completion of the baseline monitoring phase, the interventions individually designed for each participant were initiated at their determined time.

*Intervention Phase*

Information from baseline interviews was analysed by the researcher and a clinical psychologist supervisor in order to assess the current problems, and the development and maintenance of these problems, for each family relating to the child’s sleep and anxiety behaviour. The assessment measures were scored and together with the information from the baseline monitoring provided a basis for an intervention that would meet the needs of each individual child and their family.

Following completion of the baseline monitoring phase, the interventions individually designed for each participant were initiated at their determined time. An intervention training and implementation visit was held with each family. Although the interventions were designed individually for each family they followed the same structure. This involved providing the family with psychoeducation, defining goals for the family, and creating a plan of action.

Education was provided around sleep issues, for example, typical developmental sleep requirements, typical sleeping patterns, the effects of limited sleep on a child, what factors initiated and maintained sleep difficulties, and appropriate sleep hygiene. Information about anxiety was also discussed, for example, normal fears and anxieties and how avoidance and reinforcement can lead to a perpetuation of the problem, how it is maintained by parents, and appropriate expectations. Education around behavioural issues was also discussed, for example, the reinforcement properties of parental attention, escalation traps, and again, appropriate expectations. This information was provided through discussion and handouts with each family, pertaining to their situation, and led into the development of the
intervention. While this information was provided at the start of the intervention, further education was provided as required throughout the intervention.

Both parents and child were encouraged to share their goals for the programme, and they decided together what was in the best interests for all involved. From these goals, families were encouraged to break the desired outcome into smaller, achievable steps.

Reinforcement schedules were discussed and each child was asked to think of things that they could work towards. Examples of what other children had chosen were provided for those who were “stuck” for ideas. It was made clear that these rewards had to be things that they could receive the next day if they had achieved their goal for the previous night. Social rewards such as one-on-one time with a parent doing a favoured activity with a parent were encouraged. Limits were placed on the expense of other rewards to keep them realistic and achievable on a daily basis.

Parents were taught how to set appropriate limits for their child's behaviour, for example, running through with the child what was expected of them and what the outcomes would be if they did or did not comply, use of appropriate consequences for non-compliance including logical consequences and time out, and making clear and simple requests. The use of ignoring undesirable behaviour was specifically addressed as was the logic behind using it, for example, escalation traps. Problem solving was done around scenarios that typically cause parents to abandon the agreed upon plan. The child was asked how they thought they could avoid behaving badly.

To aid in reducing the child’s anxiety, each family was provided with a relaxation script (Ollendick & Cerny, 1981) to use with their child before bed. The use of self-control statements, such as “I am a brave boy. I can take care of myself in the dark” (Kanfer, Newman, & Karoly, 1975) were suggested for children who had particular fears of the dark.

The plan was written down, including the goals to be reached each night, the rewards that the child could obtain the next day, and what the parents were going to do to help their child reach the goal. Each family member was encouraged to sign the plan in order to create a
sense of ownership. Individual differences in interventions are described in the following sections.

During the intervention phase, daily phone calls to each family were initially made. This was to monitor the child’s progress and the parent’s adherence to the interventions, clarify any misunderstandings, and to provide a positive support to the parent. Phone calls were made less regularly as parents felt more capable in following the programme. This depended on their individual needs. Parents were also strongly encouraged to contact the researcher if any problems arose. The researcher also contacted the child regularly. This was to praise their efforts, provide an opportunity for the child to reason out how they had made progress with their behaviour, and to allow them to reflect on the benefits to themselves of the progress they had made.

Follow-up Phase

Three follow-ups were planned: an immediate post-intervention interview, a one week monitoring phase similar to baseline beginning 3 months following the end of the intervention, and a further interview immediately following this. At both follow-ups, the researcher again asked each parent to complete a Child Behaviour Checklist (CBCL; Achenbach & Edelbrock, 1991) and the child participant was administered the State-Trait Anxiety Inventory for Children (STAIC; Speilberger, 1973) and the Children’s Depression Inventory – Short Form (CDI-S; Kovacs, 1992).

The follow-up included an interview with each family. The purpose of this interview was to review the sleep diary records, baseline sleep behaviours and any changes. Any goals not reached were discussed and the family were provided with the opportunity to continue working towards their goals. Each person had an opportunity to analyse their role in bringing about the changes and how progress could be continued. Parents were instructed on how to fade out the rewards as the child independently maintained good sleeping behaviour.
A further follow-up monitoring phase was planned to determine the extent to which the intervention effects were maintained over time. One week was recorded for follow-up for all participants. A third and final interview similar to the post-intervention interview was planned to determine parent and child evaluation of the intervention and maintenance of any changes.

*Recording Methods*

*Child Behaviour Measure*

The Child Behaviour Checklist (CBCL; Achenbach & Edelbrock, 1991) was completed by parents on three occasions; at baseline assessment, post-interview, and at the final interview. The CBCL is a standardised questionnaire designed to provide information on a child’s (aged 4-18 years) competencies and problem areas, as reported by their parents or others who know the child well. Competency scales cover a child’s interests, activities, social networks, and school performance. Problems scales incorporate how a parent rates their child, as compared to other parents, on areas such as withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behaviour, and aggressive behaviour. The CBCL is not recommended as a diagnostic instrument but is useful in obtaining an overall picture of how a child presents and is recommended to be used in conjunction with other clinical assessments. Scores obtained above the 98th percentile are considered to be within the clinical range. The CBCL has a test-retest reliability of 0.89 and an interrater agreement of 0.66. It also has a high content and construct validity (Heard, Dadds, & Conrad, 1992). The CBCL has been used extensively in other sleep and anxiety research with children (Gregory & O’Connor, 2002; Barrett, Rapee, & Dadds, 1996; Johnson, et al., 2000)
**Self-Report Measures**

Three self-report measures were used. The State-Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973), The Children’s Depression Inventory – Short Form (CDI-S; Kovacs, 1992). Both these measures were completed by each child participant on three occasions – at baseline assessment, post-interview, and final interview. A diary of their sleep behaviour, thoughts and feelings each night, was also kept by the child.

The STAIC is a self-report measure developed for primary-school aged children. It is divided into two parts, Trait and State. The Trait covers how the child typically feels and the State was used to measure how the child felt the night before. The STAIC has been described as having adequate norms, adequate reliability, and moderate validity and recommended as a research instrument to effectively assess treatment effects (Endler, 1978). The STAIC has been used in other anxiety and sleep research by Ollendick, et al., (1991).

The CDI is a measure of state symptoms of depression among children and adolescents (7-17 years). The CDI demonstrates good internal reliability ranging from 0.71 to 0.89 and well established validity. However, limited normative data is provided and therefore results should be interpreted with caution (Kavan, 1992). The short form version is useful as a quick screening measure of depressive symptoms. The CDI has been used in anxiety research (Barret, et al., 1996) and depression research (Cole, et al., 1998; Hannan, Rapee, & Hudson, 2000).

**Sleep Diary**

Parents were given sleep diaries, consisting of a bound notebook that had a list, at the front, of behaviours to record each night of their child’s activities. They were also instructed to have their partner record independently (if they had one), for reliability. The child was also given a sleep diary and was instructed in the use of the diary and how to fill in the “thermometer” for each night. The thermometer consisted of a scale of 1-10, with 10 being the highest, of how anxious or worried they were feeling (See Appendix 4 for an example of
the thermometer). Both parents and child were instructed to record in their diaries in the morning for the previous night. If, by chance, they forgot a night or two, then they were requested to recall the nights’ events and fill in accordingly. However, if they did not record data for more than two nights, then they were asked to leave these days blank then continue on from the current night.

The families were all informed that they were to keep recording in the diary over the baseline and intervention phases. The diaries would then be collected for analysis, and returned to the families to record follow-up data.

Parents were asked to record the following on a nightly basis. The date, activities of the child prior to bedtime, the time the child was told to go to bed, the time the child actually went to bed, the time the child went to sleep. Parents were also asked to record the number of times the child got up and the parents response to this, how long it took the child to go back to sleep, whether the parent was present at sleep onset, and the time the child woke in the morning. Parents also made note of any behaviours during the night such as restless sleep, talking, nightmares, etc., and if relevant, were to note any issues that occurred during the day that might have caused their child concern.

The child was asked to make note of the following. The date of recording, what the child did when they went to bed, what they were worried about at this time, and how they felt at this time (using the thermometer). Both these diaries were the primary assessment measures for the child’s sleep behaviours and level of anxiety over the baseline, intervention, and follow-up phases. The diaries were designed by the researcher in conjunction with other literature.

*Dependent Variables*

The following dependant variables were derived from the information in the sleep diaries. They were defined as follows.
Sleep Latency

This was defined as the time between child being in bed with main sources of lights turned off and falling asleep. It is considered a sleep onset delay if it takes the child longer than 30 minutes to go to sleep (Owens, et al., 2002). This was calculated in minutes.

Bedtime Resistance

This was described as non-compliant behaviour with request to go to bed, such as, vocal protests, crying, tantrums, complaining; calling out for parental attention; coming out of their room after being put to bed (Sanders, Bor, & Dadds, 1984; Owens, et al., 2000), occurring before sleep onset and during night waking.

Night Waking

This was described as signalling to parents (e.g., calling out to parents or getting out of bed, moving to someone else’s bed during the night) upon awakening during the night (Owens, et al., 2000).

Parental Presence

A parent is present before their child goes to sleep, and/or a parent is present while their child sleeps. Parental presence while putting a child to bed, tucking them in, and/or reading a bedtime story was not defined as parental presence.

Anxiety

Child self-report ratings of their level of anxiety or worries over the course of the night, recorded the following morning. Ratings were recorded on a scale of 1-10 (1 being low anxiety and 10 being the high anxiety).

Reliability

Parents were requested to take independent records at least 2-3 times a week. The consistency between parental recordings was then directly compared to gain inter-recorder
reliability. Parental recordings were compared on the following measures: sleep onset times, i.e., the time the child went to bed and the time they fell asleep (allowed margin of error of ten minutes); whether there was parental presence and the length of time spent with the child (allowed margin of error of ten minutes); the amount of bedtime resistance (allowed margin of error of two behaviours); whether the child woke in the night (present or absent).

Further reliability checks were made by comparing parents’ sleep diary records with notes made by the researcher during telephone monitoring with the families.

Reliabilities were calculated according to Meyer’s (1999) formula. This was to divide the number of intervals of agreement (IA) by the sum of the number of intervals of agreement plus intervals of disagreement (ID) and multiplying by 100% \( \frac{IA}{IA+ID} \times 100\% \).

**Individual Procedures**

*Child 1 Cherin*

**Description**

Cherin was a 9-year-old girl whose sleeping difficulties began approximately 5 years earlier when the family moved house and Cherin received her own room. Cherin would display bedtime resistance such as resisting going to bed alone and calling out. Once in bed she would have a variety of physical complaints, such as dry eyes, headaches, and stomachaches. She required parental presence each night to the extent where her parents moved her bed into their bedroom. After the initial interview, however, her parents were able to have her share a room with her brother most nights. She also had a delayed sleep onset and could take from 30 minutes to 1 hour to get to sleep. Cherin anxiety was experienced as fears of the dark and night noises. Cherin stated that she did not like being alone at night and appeared uncertain about having her own room again.
Intervention Phase

Cherin’s intervention plan was divided into two steps. The first step involved reducing parental presence, bedtime resistance, and sleep latency, as well as her having increasing exposure to being in a bedroom alone. The second step involved Cherin moving into her own room.

In order to accomplish both steps, a positive bedtime routine was designed by the family including the use of relaxation to reduce heightened physiological arousal at bedtime. Cherin’s initial bedtime was rescheduled to a time when sleep onset currently occurred. This time was to be brought forward consecutively to the desired bedtime. During step one, Cherin was gradually exposed to greater times alone in the bedroom at night, by having her brother agree to go to bed at a later time. Everything that Cherin was likely to require was placed on a bedside table, to reduce opportunities for bedtime resistance. Cherin’s parents agreed to use extinction by ignoring all calling out and by putting her back to bed with minimal contact. The second step was introduced once Cherin was confidently going to sleep, on her own, in her brothers room and she stated enthusiasm for sleeping in her own room. To encourage a positive attitude towards having her own room again, Cherin was allowed to request some redecorations. Cherin and her parents designed a reinforcement schedule so as to reward appropriate sleep behaviour during both step one and two. Parental education and advice was provided as previously outlined. Ongoing support, in the form of regular telephone contact with the researcher, was provided also.

Child 2 Jasmine

Description

Jasmine, an 8-year-old girl, had experienced sleeping difficulties, such as patchy sleep since birth. She would display bedtime resistance by regularly getting up or reading and playing in her room after being put to bed at 7.30pm. During this time, Jasmine would
experience anxiety by ruminating on her performance in school and activities. Her sleep onset was delayed; she often took up to 2 hours to get to sleep. Jasmine regularly woke during the night and often required parental presence for the rest of the night. Her parents had tried various approaches such as medication, osteopath, homeopath, with no success. They had also tried standard extinction but were unable to persist with the programme. Jasmine also displayed behavioural difficulties at home, which were difficult to manage. Among Jasmine’s wishes was to be able to go to sleep more easily.

*Intervention Phase*

Jasmine’s intervention focused on reducing her bedtime resistance, parental presence at bedtime, and night waking. Strategies were also provided for reducing her anxieties.

A positive bedtime routine was suggested to the family, incorporating the use of relaxation. It was also suggested that Jasmine’s bedtime be initially delayed to a time when sleep onset was more likely to occur. This time could be brought forward consecutively to the desired bedtime. Jasmine’s parent’s agreed to use extinction by ignoring all calling out and by putting her back to bed with minimal contact. Jasmine and her parents designed a reinforcement schedule to reward appropriate sleep behaviours. Strategies for dealing with Jasmine’s non-compliance and anxieties over daytime issues were provided from Triple P’s behavioural management strategies and positive independent decision making programme (Sanders, 1999). Parental education and advice was provided as previously outlined. Ongoing support, in the form of regular telephone contact with the researcher, was also provided.

*Child 3 David*

*Description*

David, a 9-year-old boy, experienced a high level of anxiety at night. He had many fears of the dark including noises and possible intruders and therefore required a lamp on for the entire night. His parents also reported him having daytime anxieties, however, these were
not noticeable at school. David would display extreme bedtime resistance by repeatedly calling out and/or getting up. He would report noises and require a parent to check within the room and outside. He experienced delayed sleep onset due to his anxiety and consequent bedtime resistance. Sleep latency ranged from 30 minutes to 2 hours. David woke, almost every night, and would go into his parent’s room to sleep the rest of the night on a mattress and blanket that they had provided for him.

David’s parents had previously tried various strategies (e.g., aromatherapy, soothing him, music, and allowing him to read in bed) to help him to sleep, with no success. They obtained initial success with a reward programme, however, once David received the reward his previous behaviours returned. David also had a diagnosis of ADD and was on a small dosage of Ritalin, which was given in the morning.

Intervention Phase

David’s intervention plan was also divided into two steps. The first step involved reducing bedtime resistance, sleep latency, and parental presence in the first part of the evening. The second step involved reducing night waking and night waking resulting in parental presence.

A positive bedtime routine was designed by David and his parents. A relaxation script was also provided to aid in reducing heightened physiological arousal at night. David’s initial bedtime was delayed to a time when sleep onset was most likely to occur. This was brought forward over consecutive nights until the desired bedtime was reached. To encourage independence, confidence and exposure to feared stimuli, David was required to check for the noises in his room himself while a parent initially stood at the door. Parents were then to increase the distance from David’s door until they were out of sight. He was also instructed in the use of self-control statements. David’s parents agreed to use extinction by ignoring all calling out and by putting him back to bed with minimal contact. The second step was to be introduced once David had shown improvements in settling to sleep unassisted for the period
of one week. This involved his parents returning David to his bed on night waking and removing the mattress and blanket from the floor of their room. David and his parents designed a reinforcement schedule so as to reward appropriate sleep behaviour. Strategies for dealing with David’s non-compliance were provided from Triple P’s behavioural management strategies (Sanders, 1999). Parental education and advice was provided as previously outlined. Ongoing support, in the form of regular telephone contact with the researcher, was provided also.

Child 4 Louise

Description

Louise was a 10-year-old girl whose sleeping problems began 3-4 years ago with no apparent cause. Louise required parental presence each night in order to go to sleep. She would display delayed sleep onset only when her mother was not present. Sleep onset ranged from 15 minutes to 3 hours. Louise would also wake during the night and require parental presence in order to return to sleep, alternatively she would watch television in bed. Without parental presence, Louise would display bedtime resistance by repeatedly calling out or getting up. Louise was currently taking prescribed medication, Phenergan, to aid in sleeping. Louise experienced anxiety such as fears of the dark at night-time and required a lamp on for the entire night. She also experienced some anxieties during the day.

Louise’s parents had previously tried turning the lamp off and shutting her door, however this resulted in Louise becoming greatly distressed. Her mother had also tried extinction with initial success, but this was not maintained. Rewards had not previously been a motivating factor for Louise. The extent of Louise’s sleeping and anxiety problems had come to cause conflict within the family.
Intervention Phase

Louise’s intervention focused on reducing her bedtime resistance, parental presence at bed time, night waking and encouraging compliance with bedtimes. Strategies were also provided for reducing her anxieties.

A positive bedtime routine was designed by Louise and her mother, including the use of relaxation. Louise’s initial bedtime was delayed to a time when sleep onset was most likely to occur. This was to be brought forward consecutively to the desired bedtime. Inadequate sleep hygiene was attended to in the removal of television watching. Louise’s parents agreed to use extinction by ignoring all calling out and by putting her back to bed with minimal contact. The lamp was to be left on and the door left open until Louise was successfully settling to sleep. Louise was encouraged to use self-control statements when she felt scared. Louise and her mother designed a reinforcement schedule so as to reward appropriate sleep behaviour. Parental education and advice was provided as previously outlined. Ongoing support, in the form of regular telephone contact with the researcher, was provided also.

Child 5 'M' Shane

Description

Shane, an 11-year-old boy, had experienced sleeping difficulties irregularly since birth. He exhibited bedtime resistance by not complying with requests to go to bed, calling out and getting up. He would also engage in a competing activity in bed such as reading, playing, or watching television. This activity could last until 12.30am. Consequently, sleep onset was delayed. Shane also required parental presence on night waking. On occasions when his sister would share the room, he displayed less sleep problem behaviours. Shane also reported that he had fears of the dark and night-time noises and therefore required the bedside lamp on to go to sleep.
Shane’s mother had previously tried medication and herbal remedies without success. She also reported concerns about Shane’s aggression and non-compliance at home along with difficulties at school and with schoolwork.

Intervention Phase

Shane’s intervention focused on reducing his bedtime resistance, parental presence, night waking and encouraging compliance with bedtimes. Strategies, such as coping statements and deep breathing, were also provided for reducing his anxieties.

A consistent bedtime routine was agreed to with appropriate bedtimes. Shane was allowed to read or watch television in bed for 30 minutes only, at which time the main light was to be turned off. Shane’s mother agreed to use extinction by ignoring all calling out and by putting him back to bed with minimal contact. Shane and his mother designed a reinforcement schedule so as to reward appropriate sleep behaviour. Parental education and advice was provided. Ongoing support, in the form of regular telephone contact with the researcher, was provided also.
CHAPTER 3

Results

Each of the five participants completed each phase of the study. For each participant, some baseline data were available prior to the set starting dates. It was decided to include this data as it provided greater detail about the child’s sleep behaviours over a longer period as there were nights of missing data and variable frequencies of behaviours. Two participants, Cherin and Jasmine, completed the intervention phase within the 28 days scheduled. The other three participants extended their intervention phases, by parental request. These interventions were 46, 53, and 72 days respectively. Two diaries were lost, David’s parent’s diary and Louise’s diary. Louise was able to restart recording during the intervention phase. David’s parents did not attempt to continue recording. Data for David were obtained via telephone contact with the researcher. However, due to the irregular frequency of telephone contact, David’s results are interpreted with caution.

Reliability

Both parents were requested to make diary records independently 2-3 times a week but no participants did so. Therefore, reliability between diary records and notes made during telephone contact could be calculated. Reliability was taken for each sleep behaviour, averaged, and calculated as a percentage. Results are displayed in Table 3.

Table 3

Summary Of The Reliability Of Parents Recordings And Telephone Contact With Therapist

<table>
<thead>
<tr>
<th>Participant</th>
<th>Mean Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cherin</td>
<td>97%</td>
</tr>
<tr>
<td>David</td>
<td>Diary lost</td>
</tr>
<tr>
<td>Jasmine</td>
<td>98%</td>
</tr>
<tr>
<td>Louise</td>
<td>73%</td>
</tr>
<tr>
<td>Shane</td>
<td>100%</td>
</tr>
</tbody>
</table>
Parental Compliance

Parental compliance with the intervention requirements was calculated in order to determine whether the outcomes for each participant could be attributed solely to the intervention plans. This also provides information on the parents' acceptance of and understanding of the intervention. The number of nights where parental presence was not displayed and the number of nights when there was some recording in the diaries during the intervention phase were calculated as percentages. These percentages do not reflect completion of diary recordings. These are displayed on Table 4.

Table 4

Parental Compliance with Intervention Requirements

<table>
<thead>
<tr>
<th>Participant</th>
<th>Parental Presence</th>
<th>Diary Recording</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cherin</td>
<td>89.3%</td>
<td>67.9%</td>
</tr>
<tr>
<td>David</td>
<td>63.9%</td>
<td>-</td>
</tr>
<tr>
<td>Jasmine</td>
<td>75%</td>
<td>85.7%</td>
</tr>
<tr>
<td>Louise</td>
<td>63%</td>
<td>95.6%</td>
</tr>
<tr>
<td>Shane</td>
<td>83%</td>
<td>81.1%</td>
</tr>
</tbody>
</table>

The information on Table 4 shows that parental compliance with not providing parental presence averaged 74.8%. Parental compliance with diary recording (excluding David) averaged 82.6%.

Information about compliance with other aspects of the intervention could not be ascertained from the available data, such as parental responding to bedtime resistance, which may have shown a higher percentage of non-compliance. Compliance with parental presence was the most distinguishable.
Analysis of Results

These results are incomplete due to missing data for all participants and across all behaviours.

Sleep Problem Behaviours

Sleep latency was converted to minutes and displayed in Figure 1. The presence or absence of bedtime resistance, parental presence, and competing activities was also displayed. Frequencies for bedtime resistance, parental presence, night waking and night waking resulting in parental presence, and complete nights spent in own room across phases were calculated (number of nights each participant engaged in these behaviours per phase). The mean duration of parental presence was calculated for Jasmine and Shane: These are displayed in Table 5. Inconsistencies and missing data in the recording of the sleep diaries means results may not be based on accurate representations for each participant.

Sleep Onset. Figure 1 show that three participants, David, Louise, and Shane, showed a decrease in sleep onset latency during intervention, however these improvements were not maintained at follow-up. Cherin displayed a reduction in sleep onset latency at follow-up only. Jasmine showed no improvements across any phase.

Bedtime Resistance. Louise and Shane were the only participants to show a reduction in the frequency of bedtime resistance (Table 5). These results were maintained at follow-up. All other participants showed an increase in frequency of bedtime resistance across all phases. Shane also displayed engagement in a competing activity in bed. A reduction in nights where this activity took place occurred during intervention, however was not maintained at follow-up (Figure 1-5).

Parental Presence. A reduction in the frequency of nights of parental presence was shown for four participants, Cherin, Jasmine, Louise, and Shane during intervention (Table 5). Cherin and Louise showed further reductions at follow-up. Jasmine and Shane displayed an increase above baseline frequency at follow-up. Figure 1-2 shows that there were some
reductions for David towards the end of the intervention phase, however, these reductions were not maintained at follow-up. Table 5 shows that for Jasmine and Shane, the mean duration of parental presence increased across the three phases.

_Night Waking (Table 5)._ Three participants, Jasmine, Louise, and Shane displayed a reduction in the frequency of night waking during intervention. However, only Louise made further reductions at follow-up. For the other two participants frequency of night waking increased at follow-up, with Jasmine displaying a higher frequency than at baseline.

_Night Waking Resulting in Parental Presence (Table 5)._ David displayed a reduction in the frequency of night waking resulting in parental presence from intervention phase to follow-up. Jasmine displayed a reduction during the intervention phase, however this returned to baseline levels at follow-up. Louise displayed an initial increase during intervention, then a full reduction at follow-up. Shane displayed an increase across all phases.

_Complete Nights Spent in Own Room (Table 5)._ Cherin, Louise, and Shane displayed an increase in the frequency of complete nights spent in their own rooms. This increase continued at follow-up for Cherin and Louise only. The frequency decreased for Shane at follow-up to below baseline levels. David showed a reduction in frequency from intervention to follow-up.
Figure 2. Graphs showing changes in participant's nightly self-rated levels on anxiety, across phases.
Figure 1. Graphs showing changes in sleep onset latency and frequency of parental presence, bedtime resistance, and engagement in completing activities for participants 1-5 across phases.
Figure 3. Graphs showing the change in participant's percentiles across phases on State-Anxiety, Trait Anxiety, and on the CDI.
### Table 5

**Frequency and Duration of Sleep Behaviours of the Five Participants Across Phases**

<table>
<thead>
<tr>
<th>Participants</th>
<th>Total Number of Nights</th>
<th>Frequency of Bedtime Resistance</th>
<th>Frequency of Parental Presence</th>
<th>Mean Duration of Parental Presence</th>
<th>Duration Range of Parental Presence</th>
<th>Frequency of Night Waking</th>
<th>Frequency of Night Waking Resulting in Parental Presence</th>
<th>Frequency of Complete Nights Spent in Own Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cherin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>9</td>
<td>33.3%</td>
<td>66.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0%</td>
</tr>
<tr>
<td>Intervention</td>
<td>28</td>
<td>35.7%</td>
<td>10.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28.6%</td>
</tr>
<tr>
<td>Follow-up</td>
<td>7</td>
<td>57.1%</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>85.7%</td>
</tr>
<tr>
<td>David</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>72</td>
<td>18.1%</td>
<td>69.4%</td>
<td></td>
<td></td>
<td></td>
<td>52.8%</td>
<td>100%</td>
</tr>
<tr>
<td>Follow-up</td>
<td>7</td>
<td>28.6%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>85.7%</td>
</tr>
<tr>
<td>Jasmine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>28</td>
<td>26.1%</td>
<td>43.5%</td>
<td>3.33hrs</td>
<td>1.00-10.00</td>
<td>39.1%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>28</td>
<td>35.7%</td>
<td>25%</td>
<td>3.40 hrs</td>
<td>1.25-11.00</td>
<td>35.7%</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Follow-up</td>
<td>7</td>
<td>57.1%</td>
<td>71.4%</td>
<td>4.45 hrs</td>
<td>2.50-11.30</td>
<td>57.1%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Louise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>18</td>
<td>72.2%</td>
<td>88.9%</td>
<td></td>
<td></td>
<td>44.4%</td>
<td>62.5%</td>
<td>72.2%</td>
</tr>
<tr>
<td>Intervention</td>
<td>46</td>
<td>65.2%</td>
<td>36.9%</td>
<td></td>
<td></td>
<td>41.3%</td>
<td>68.4%</td>
<td>84.8%</td>
</tr>
<tr>
<td>Follow-up</td>
<td>7</td>
<td>57.1%</td>
<td>14.3%</td>
<td></td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Shane</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>28</td>
<td>53.6%</td>
<td>21.4%</td>
<td>4.06 hrs</td>
<td>1.15-8.15</td>
<td>39.3%</td>
<td>36.4%</td>
<td>85.7%</td>
</tr>
<tr>
<td>Intervention</td>
<td>53</td>
<td>24.5%</td>
<td>13.2%</td>
<td>4.41 hrs</td>
<td>1.35-9.00</td>
<td>22.6%</td>
<td>58.3%</td>
<td>86.2%</td>
</tr>
<tr>
<td>Follow-up</td>
<td>7</td>
<td>14.3%</td>
<td>42.9%</td>
<td>5.26 hrs</td>
<td>0.35-9.45</td>
<td>28.6%</td>
<td>100%</td>
<td>71.4%</td>
</tr>
</tbody>
</table>

*Note.* Mean duration and range of parental presence data was not available for Jasmine and Shane. Cherin did not present with night waking. The frequency of complete nights spent in own room was not applicable to Jasmine as parental presence took place in her own room.
Anxiety

The nightly ratings of anxiety, by each participant, are displayed on Figure 3. Three participants, Cherin, Jasmine, and Shane displayed a reduction in self-ratings of anxiety during intervention phase. Cherin and Louise displayed further reductions at follow-up. Shane’s ratings of anxieties increased again although not to the same extent as at baseline. David’s level of anxiety increased during intervention then slightly decreased at follow-up but not to his level of baseline anxiety.

The scores on the STAIC-State and STAIC-Trait measure from the three interviews with each participant were converted to percentile ranks and graphed (Figures 3-1&2). Three participants, Cherin, Jasmine, and Louise displayed a decrease on State Anxiety from baseline to post-intervention. Cherin and Louise showed further reductions, however, Jasmine showed an increase at follow-up that returned her rating to baseline level. Shane’s State Anxiety remained stable from baseline to post-intervention but displayed an increase at follow-up. David showed an increase in rating from baseline to post-intervention with a slight decrease at follow-up.

Three participants, Cherin, Louise, and Shane showed a decrease in Trait Anxiety from baseline to post-intervention. Cherin and Louise maintained these reductions at follow-up, however, Shane displayed an increase at follow-up. Jasmine and David showed an increase from baseline to post-intervention, which was mostly maintained at follow-up.

Parents’ ratings of anxiety / depressive symptoms on the CBCL at baseline, post-intervention, and follow-up were converted to T-scores and normal, borderline clinical, and clinical ranges. (See Appendix 5 for a full list of scores for each participant). Normal ranges of anxiety / depressive symptoms, as reported by both parents were maintained across phases for Cherin and Louise. Clinical ranges were maintained across phases for David, as reported by his mother. David’s father reported an increase in symptoms from baseline (within the normal range) to clinical range for both post-intervention and follow-up. Jasmine was
reported by her mother to be within the clinical range across all phases. Her father reported a
decrease in symptoms from borderline clinical at baseline to normal range for post-
intervention and follow-up. Shane displayed a reduction in symptoms, as reported by his
mother, from clinical range at baseline to within normal range for post-intervention and
follow-up.

*Depression.*

The scores on the CDI measure from the three interviews with each participant were
converted to percentile ranks and graphed (Figure 3-3). Louise displayed a large decrease in
the CDI rating from baseline to post-intervention, which remained stable across follow-up.
Jasmine and David displayed a dramatic increase in this rating from baseline to post-
itervention and both participant’s ratings remained stable at follow-up. Cherin’s and Shane’s
ratings remained stable over baseline and post-intervention with both participants displaying a
minimal decrease at follow-up.

*Child 1 Cherin*

Cherin’s presenting problems were delayed sleep onset, parental presence, bedtime
resistance, being unable to sleep in her own room and anxiety.

*Sleep Problem Behaviours*

*Sleep Latency.* Cherin displayed extremely variable sleep onset latency during baseline
(Figure 1-1). This ranged from 30–180 minutes. At the introduction of intervention, there was
a decrease in sleep onset latency and in its variability. A decline was displayed towards the
end of Step 1. From Step 2, the rate increased again, with one night displaying a dramatic
peak in sleep onset latency. A substantial, stable, decrease in sleep onset latency was
displayed at follow-up.
Parental Presence. Cherin received parental presence for two-thirds of the nights during baseline. This decreased dramatically from baseline to intervention and further reduced to 0% at follow-up (Table 5).

Bedtime Resistance. Cherin showed a slight increase, from baseline, in the frequency of bedtime resistance during the intervention phase. A higher rate of bedtime resistance was displayed during Step 2 of the intervention phase than in Step 1 (Figure 1-1). At follow-up the frequency increased again to a higher level (Table 5).

Complete Nights Spent In Own Room. Table 5 shows that the number of nights Cherin spent in her own room increased slightly over intervention. At follow-up, this had increased to every night, with the exception of one night spent away from home.

Anxiety

Cherin’s nightly self-ratings of anxiety displayed a variable pattern during baseline (Figure 2-1). Only one night recorded at baseline was above a rating of 1. During intervention, there were no ratings above 1. At follow-up, these ratings had further reduced to between 0 and 0.5.

Cherin showed a rapid decrease in percentile rank on State Anxiety from baseline to post-intervention and a further decrease at follow-up (Figure 3-1). A decrease was also shown on Trait Anxiety from baseline to post-intervention and was maintained at follow-up (Figure 3-2).

Both of Cherin’s parents reported her as displaying anxiety / depressive symptoms within the normal range, as compared to other girls aged 4-11, on the CBCL (See Appendix 5-1 for a full list of scores). This was maintained across each phase. However, her mother reported Cherin as having somatic complaints and her total Internalising T-score was within the clinical range. These scores were also maintained across phases. There were no scores outside the normal range as completed by Cherin’s father.
Depression

Cherin displayed a high percentile rank on the CDI at baseline, which was maintained at post-intervention, followed by a small decrease at follow-up (Figure 3-3).

Child 2 David

David’s presenting problems were delayed sleep onset, parental presence, bedtime resistance, night waking which resulted in parental presence, being unable to sleep complete nights in his own room and anxiety. David’s parent’s diary was lost. Examples of baseline data were obtained from the baseline interview. The intervention phase was initially extended at the parent’s request in order to obtain a successful outcome for David’s sleeping behaviour (i.e., going to sleep on time without bedtime resistance and sleeping through the night). After 72 days, they declined further intervention. Information from telephone contact was used to show an incomplete record of David’s sleep behaviours during intervention and follow-up phases.

Sleep Problem Behaviours

Sleep Latency. At baseline, David’s range of sleep latency was reported to be between 30-120 minutes (Figure 1-2). After intervention, he showed an initial increase in sleep latency followed by a variable decrease over 10 days, which then remained low and stable. After the start of Step 2, sleep onset latency increased with a large peak after 5 days. It then decreased and remained stable. At follow up, sleep onset latency ranged from 15-75 minutes. A variable pattern was initially displayed which then decreased and became stable.

Parental Presence. Parental presence was reported each night during baseline and Step 1 of the intervention (Figure 1-2). No parental presence occurred for three nights in Step 2. Nights of parental presence increased to 100% at follow-up as compared to the intervention phase (Table 5).
Bedtime Resistance. David was reported to display bedtime resistance each night during baseline (Figure 1-2). Variable bedtime resistance was initially displayed during Step 1 in the intervention phase, then decreased. David showed an increase in the frequency of bedtime resistance from intervention to follow-up (Table 5).

Night Waking. Night waking frequency increased from intervention to follow-up where it was at 100% (Table 5). However, night waking resulting in parental presence decreased at follow-up.

Complete Nights Spent in Own Room. During the intervention phase, David spent a small proportion of complete nights in his own room. This was not maintained at follow-up.

Anxiety

David’s self-rated level of anxiety was variable across all phases (Figure 2-2). His anxiety rating at baseline ranged from 0-5. During intervention, these ratings showed a gradual increase. The rate of anxiety decreased slightly at follow-up but not to the same level as baseline.

David displayed an increase in State Anxiety from baseline to post-intervention, which was maintained at follow-up (Figure 3-1). He also displayed similar ratings on the Trait Anxiety, increasing from baseline to post-intervention with a further minimal increase at follow-up (Figure 3-2).

Both of David's parents reported him as displaying more symptoms of anxiety/depression than other boys aged 4-11 years (See Appendix 5-2 for a full list of scores). These ratings scored within the clinical range across the three phases, except for his father's rating at baseline, which was within normal range. David’s total Internalising T-score and Total T-score were within the clinical range across all phases for both parents, with the exception of the father’s baseline reporting. Also of note, were David’s ratings on thought problems and attention problems, which fell within the borderline clinical range.
Depression

David displayed a substantial increase on the CDI from baseline to post-intervention, which was maintained at follow-up (Figure 3-3).

Child 3 Jasmine

Jasmine’s presenting problems were parental presence, bedtime resistance, delayed sleep onset, and night waking which resulted in parental presence, and anxiety.

Sleep Problem Behaviours

Sleep Latency. Jasmine displayed variable sleep onset latency during baseline, however, the mid-range fell between 30-60 minutes with a couple of nights outside this range (Figure 1-3). Less variability was displayed during intervention, however the mid-range of 30-60 minutes was maintained. No change in sleep onset latency occurred during follow-up.

Parental Presence. Nights of parental presence decreased from baseline to intervention but increased beyond baseline recordings at follow-up (Table 5). The mean duration of parental presence each night consecutively increased across the three phases.

Bedtime Resistance. The frequency of bedtime resistance displayed by Jasmine increased consecutively over the three phases (Table 5).

Night waking. Jasmine displayed a small decrease in frequency of night waking from baseline to intervention (Table 5). At follow-up, this increased to a higher level than at baseline. From these night wakings, those that resulted in parental presence decreased from baseline to intervention then returned to baseline line frequency at follow-up (Table 5).

Anxiety

Jasmine displayed variable self-ratings of anxiety during baseline (Figure 2-3). The majority of ratings were between 1-2, however an increase in anxiety was displayed before intervention showing the highest rating of 7. During intervention, Jasmine’s anxiety ratings
decreased and remained stable. These were maintained at follow-up, except for the last night, which was rated at 4.

Jasmine displayed a gradual decline on State Anxiety from baseline to post-intervention, however her scores increased again at follow-up (Figure 3-1). On Trait Anxiety, Jasmine displayed an increase from baseline to post-intervention, and this remained stable at follow-up (Figure 3-2).

Jasmine’s mother reported her as displaying more symptoms of anxiety/depression than other girls aged 4-11 years (See Appendix 5-3 for a full list of scores). This score was within the clinical range across all phases. Jasmine’s father reported her as displaying anxiety/depression in the borderline clinical range at baseline and within normal range at post-intervention and follow-up. Both parents reported Jasmine’s total Internalising T-score and Total T-score as in the clinical range across all phases except for Jasmine’s father at follow-up, who reported her to be within normal range.

**Depression**

On the CDI, Jasmine displayed a large increase in her scores from baseline to post-intervention, which was maintained at follow-up (Figure 3-3).

**Child 4 Louise**

Louise’s presenting problems were parental presence, bedtime resistance, delayed sleep onset, night waking and anxiety. The intervention phase was extended at the request of Louise’s family until their goals of having Louise go to sleep without bedtime resistance, requiring parental presence, and sleeping through the night, were reached.

**Sleep Problem Behaviours**

*Sleep Latency.* Louise displayed variable sleep onset latency during baseline (Figure 1-4). This ranged from 20-210 minutes. After intervention implementation there was a gradual decline, with less variability. Louise continued to display variable sleep onset latency,
during intervention, with a mid-range between 10-50 minutes. At follow-up, sleep onset latency was again variable, however with the majority of nights within the 10-20 minutes range.

*Parental Presence.* The number of nights of parental presence dramatically decreased from baseline to intervention (Table 5). Further reductions were made at follow-up.

*Bedtime Resistance.* The number of nights of bedtime resistance was highest at baseline and decreased consecutively over intervention and follow-up phases (Table 5). However, frequency at follow-up remained above 50%.

*Night Waking.* Louise displayed a small decrease in night waking from baseline to intervention then further decreased to 0% at follow-up (Table 5). Night waking resulting in parental present increased slightly from baseline but also reduced to 0% at follow-up (Table 5).

*Complete Nights Spent in Own Room.* The number of whole nights Louise spent in her own room increased across all phases to 100% at follow-up.

*Anxiety*

No baseline recordings were made (Figure 2-4). Louise’s anxiety self-ratings showed a variable pattern during intervention, ranging mainly between 0-4, with one night at 9. A decrease in ratings was displayed towards the end of intervention. At follow-up, all anxiety ratings were 0.

Louise displayed a dramatic decrease on State Anxiety from baseline to post-intervention with further minimal reductions at follow-up (Figure 3-1). On Trait Anxiety, Louise showed a more gradual decrease from baseline to post-intervention and further reducing to 0% at follow-up (Figure 3-2).

Both of Louise’s parents reported no concerns outside of the normal range, across all phases, as compared to other girls aged 4-11, on the CBCL measure (See Appendix 5-4 for a
full list of scores). Their highest rated concerns during baseline were Louise’s somatic complaints. These complaints were not maintained at post-intervention or follow-up.

**Depression**

Louise displayed a decrease on the CDI from baseline to post-intervention which was maintained at follow-up (Figure 3-3).

**Child 5 Shane**

Shane’s primary presenting problems were delayed sleep onset, parental presence, bedtime resistance, engaging in a competing activity, night waking and anxiety. The intervention phase was extended at Shane’s mother’s request in order to obtain a successful outcome of having Shane go to bed on time, without bedtime resistance, and sleeping through the night.

**Sleep Problem Behaviours**

**Sleep Latency.** Shane displayed variable sleep onset latency during baseline (Figure 1-5). This ranged from 5-120 minutes. A small decrease was displayed in sleep latency once the intervention had been implemented. A further decrease, and less variability, was displayed from day 55. Shane’s sleep onset latency showed an initial increase then decreased at follow-up to within the range of 10-40 minutes.

**Parental Presence.** The frequency of parental presence decreased from baseline to intervention but increased again at follow-up to a higher level than at baseline (Table 5). The mean duration of parental presence showed an increase across all phases (Table 5).

**Bedtime Resistance.** The number of nights of bedtime resistance by Shane decreased consecutively from baseline to follow-up (Table 5).

**Engaging in a Competing Activity.** During baseline, Shane displayed a high proportion of nights where he was involved in a competing activity in bed (Figure 1-5). No change was initially shown after intervention implementation but this displayed a decrease towards the
end of this phase. A return to baseline levels of nights where Shane engaged in competing activities in bed was displayed at follow-up.

*Night Waking.* The frequency of night waking decreased over intervention from baseline but increased slightly again at follow-up (Table 5). From these night wakings, the number resulting in parental presence increased consecutively from baseline to follow-up, reaching 100% (Table 5).

*Complete Nights Spent in Own Room.* Shane increased the number of nights spent in his own room from baseline to intervention (Table 5). However, at follow-up, this had decreased to below baseline levels.

*Anxiety*

Shane displayed a variable decrease in anxiety self-rating during baseline (Figure 2-5). A high proportion of these nights, Shane required the lamp on to go to sleep. The level of anxiety remained variable across all phases. A decrease in anxiety was displayed towards the end of the intervention phase. The proportion of nights with the lamp on also greatly decreased from baseline to intervention. At follow-up, anxiety ratings increased again to levels similar to those displayed at the end of the baseline phase.

Shane’s State Anxiety remained stable across baseline, post-intervention, and increased at follow-up (Figure 3-1). Shane displayed a minimal decrease on Trait Anxiety from baseline to post-intervention, however this increased to above baseline levels at follow-up (Figure 3-2).

Shane displayed anxiety/depression symptoms in the clinical range at baseline, as reported by his mother on the CBCL, as compared to other boys aged 4-11 years of age (See Appendix 5-5 for a full list of scores). All ratings were within normal range at post-intervention or follow-up. However, the total Internalising T-score at post-intervention was in the borderline clinical range.
Depression

Shane displayed a high percentile ranking on the CDI with baseline and post-intervention remaining stable and a minimal decrease at follow-up (Figure 3-3).
CHAPTER 4

Discussion

Summary and Interpretation of Results

Hypothesis 1

This study provides preliminary results that indicate a relationship between sleep and anxiety in children may occur. Each of the five participants who initially presented with sleep difficulties also experienced anxiety as measured by interview and the STAIC. A relationship is further supported in that anxious avoidance behaviours such as requiring parental presence and bedtime resistance, as determined during initial assessment interview, were seen to interfere with the onset of sleep. When these behaviours decreased, sleep onset latency decreased also. Four of the five participants in this study showed a reduction in anxiety and of those four, Cherin, Louise, and Shane showed a reduction in problem sleep behaviours also.

Hypothesis 2

The use of a behavioural family intervention in the treatment of sleep difficulties and anxieties showed mixed results. During the intervention, decreases were seen in 1) Parental Presence, for four participants only, Cherin, Jasmine, Louise and Shane; 2) Bedtime Resistance, for two participants, Louise and Shane; 3) Delayed Sleep Onset, in three participants, Cherin, Louise, and Shane; 4) Anxiety, in four participants, Cherin, Jasmine, Louise, and Shane on self-rating, two participants on the STAIC, Cherin and Louise, and two participants according to parental measures, Jasmine (by her father) and Shane, Cherin and Louise remained within the normal range; and, 5) Night Waking, for two participants, Louise and Shane.

Reductions in parental presence and delayed sleep onset were not maintained at follow-up for Shane. Reductions in self-rated anxiety were not maintained for both Jasmine
and Shane. (Improvements for David were not added due to insufficient data in order to obtain an accurate analysis.)

These results show limited support for the effectiveness of a behavioural family intervention for this client group. It appeared most successful for reducing participants' self-ratings of anxieties followed by reductions in parental presence and sleep onset latency. Least improvements were shown for bedtime resistance and night waking.

Hypothesis 3

Preliminary results indicate that a link to the development of depression in children with sleep difficulties and anxieties may occur. This is partially shown by three participants, Cherin, Louise, and Shane who all displayed depressive symptoms within the higher percentile ranges during baseline. Decreases in these scores were shown for Louise at post-intervention and for Cherin and Shane at follow-up. The two participants who showed limited or no improvements during intervention, David and Jasmine, showed a substantial increase in depression scores. This preliminary finding suggest that successfully intervening with children with sleeping difficulties may reduce the risk of depression.

Child 1 Cherin

From Cherin's presenting problems, improvements were displayed in the following areas. Cherin showed an improvement in sleep onset latency at follow-up. She required less parental presence. Diary records also indicated that duration of parental presence also decreased. Cherin improved from being unable to sleep in her own room, to sleeping almost every night at follow-up. Cherin displayed improvements in self-rated anxiety, State and Trait Anxiety, as well as depressive symptom scores. There was no change in parental reporting of anxiety / depressive symptoms from within the normal range on the CBCL. An intervention effect is indicated for these improvements.

Deterioration of bedtime resistance was displayed and no change in maternal reporting of somatic complaints on the CBCL was shown.
At post-intervention, Cherin’s parents reported still having difficulty with consistent bedtimes. Cherin was still displaying bedtime resistance by calling out and had continued experiencing somatic complaints. At follow-up, 6 weeks later, they reported Cherin as being more independent and no somatic complaints had been made within the previous week. Cherin stated that she was happy going to bed and enjoyed having her own room. However, they were still experiencing difficulties with consistent bedtimes and calling out.

These remaining difficulties may have been due to aspects of the intervention not being maintained. Cherin’s parents had not consistently used the rewards structure and they continued to respond to Cherin’s calling out. By her parents not consistently rewarding compliance, this may have reduced Cherin’s motivation to adhere to parental requests for bedtime. Similarly, by responding to Cherin’s bedtime resistance in calling out, provided an intermittent positive reinforcement for doing so and increased her bedtime resistance over time.

Of note is that Cherin’s mother reported no change in somatic complaints on the CBCL, however, at follow-up interview stated that Cherin had made no physical complaints in the last week.

Child 2 David

From David’s presenting problems, improvements were displayed in sleep onset latency, parental presence, bedtime resistance, frequency of night waking, and complete nights spent in his own room. However, none of these improvements were maintained at 3 week follow-up. Frequency of night waking resulting in parental presence displayed an improvement in follow-up only. No change was reported in parental ratings of David’s anxiety / depressive symptoms. Telephone contact also revealed an increase in sleep latency and bedtime resistance between days 54-62 due to a reported increase in David’s anxiety as there had been burglars in the neighbourhood. As this information was not recorded by the parents, it has not been displayed on the figures.
Deterioration in self-rated anxiety, State and Trait Anxiety, and depression was displayed from baseline to post-intervention.

Intervention Step 2, was introduced with the aim of assisting David to sleep the entire night in his own bed. The intervention phase was discontinued before David was able to consistently sleep entire nights on his own, at the parent’s request, as they felt unable to continue the routine.

At post-intervention, David’s parents reported that while he still used delaying tactics he had improved in going to bed by himself. He had also improved on requiring noises to be checked. They had also found the reward system useful and removing the mattress and blanket from the floor of their room. However, David’s night waking was still their biggest concern. At follow-up, no change had been reported in his behaviours.

The continuation of David’s sleep problem behaviours and anxiety, may be due to parental non-compliance with aspects of the intervention. David’s mother reported difficulty in using standard extinction as a response to his bedtime resistance. Both parents reinforced David’s avoidance of anxiety stimuli by providing parental presence and engaging in distracting rituals such as checking for noises. These sleep behaviours were inconsistently reinforced and therefore, not only made the behaviours more entrenched but in some cases an escalation of the frequency of behaviours occurred. Although repeated instructions and guidance from the researcher were provided, these issues were not resolved.

Child 3 Jasmine

From Jasmine’s presenting problems, improvements were displayed in parental presence, and night waking, however these improvements were not maintained at follow-up of 6 weeks. Jasmine also displayed improvements in self-rated anxiety. Initial improvements were shown in State Anxiety, however these were not maintained at follow-up. No improvement was shown in sleep onset latency and Jasmine displayed deterioration in bedtime resistance, Trait Anxiety and depressive symptoms. Maternal reporting of anxiety /
depressive symptoms on the CBCL remained in the clinical range. Paternal reporting of these symptoms decreased to within the normal range. While these improvements were seen, they were minimal and were not maintained. In some cases, there was a deterioration of behaviours.

At post-intervention, Jasmine’s parents reported that she was now sleeping through the night. They reported improved behaviour since school had finished and improvements in her general mood. Since Jasmine’s worries were often based on school issues it is unclear what role finishing school, as opposed to the intervention, had on her sleep behaviours and anxiety. Jasmine’s parents reported that they did not believe the rewards had worked as an incentive for behaviour change and Jasmine’s mother stated that she had found it difficult to reward good sleep behaviour when misbehaviour was occurring in other areas. Consequences for misbehaviour had been more useful. They had also come to believe that Jasmine was able to control her behaviour when she wanted to. At follow-up, they felt that she had still made some improvements, for example, her bedtime resistance had decreased and her sleep latency had improved. However, night waking was still resulting in parental presence. Jasmine’s father stated that he was too tired to change his behaviour in this aspect. Rewards and consequences were no longer being used and Jasmine’s parents felt too tired to enforce any regulations. They hoped that she would outgrow these problems.

A reason for Jasmine’s continuation of sleep problem behaviours may have been the parent’s difficulties understanding their role in maintaining Jasmine’s behaviour and anxieties. This may have been a factor in their inconsistent application of the intervention programme. The reward schedule had not been consistently applied and Jasmine’s parents appeared too tired and overwhelmed to deal with her non-compliance.

Child 4 Louise

From Louise’s presenting problems, improvements were displayed in all areas. Improvements in sleep onset latency, parental presence, bedtime resistance, night waking,
complete nights spent in her own room, self-rated anxiety as well as State and Trait Anxiety, and depressive symptoms were shown. Improvements in sleep onset latency, however, were not maintained to the same extent at follow-up of 6 weeks. Louise’s parents reported no change of anxiety / depressive symptoms, from within normal range, on the CBCL.

At post-intervention interview, Louise’s mother reported that she was no longer coming into the parent’s room, she had not watched television in bed once during intervention, and only on rare occasions required parental presence. Louise had been motivated by the rewards provided and had managed her worries by “getting them out of her head”. At the follow-up interview, similar results were reported. They had found the later bedtime helpful in reducing bedtime resistance and parental presence. Louise no longer felt afraid of the dark.

The intervention phase was initially extended in order to provide support for Louise’s mother to restart the programme after a setback while Louise was unwell. Her mother also had difficulty consistently applying extinction and therefore extended the time Louise took to show improvements.

**Child 5 Shane**

From Shane’s presenting problems, improvements were displayed in sleep onset latency and bedtime resistance. Improvements were also shown in parental presence, engaging in a competing activity, night waking, and complete nights spent in his own room. However, these improvements were not maintained at follow-up. Shane displayed initial improvements in self-rated anxiety, which was not maintained at follow-up. After a small improvement in Trait Anxiety, Shane showed a deterioration in rating, as well as a deterioration on State Anxiety. Maternal reporting on anxiety / depression on the CBCL, however, showed improvements. Shane displayed no improvement in night waking and in fact deteriorated. A small improvement was shown in depression rating.
At post-intervention interview, Shane’s mother reported a large improvement in Shane’s sleeping. He was going to sleep earlier and easier. Shane also believed he had made changes. His parents also reported nights where Shane did not require the night light on. An initial reward structure, suggested by Shane, did not appear to be achievable and was resulting in no behavioural changes. Once a new structure, which provided a small monetary reward for each individual behaviour, was introduced, Shane displayed a dramatic improvement across all behaviours. Because of this delay in improvements, the intervention phase was extended. At follow-up interview, Shane’s sleeping behaviours had deteriorated. He had returned to engaging in his old behaviours such as having a competing activity in bed, going to sleep late, and going in to his mother’s bed on night waking. His mother reported that his daytime behaviours had escalated and were causing many issues. She also stated that she had removed the reward structure, as Shane appeared to be relying too heavily on the rewards for compliance.

Summary for Individual Participants

This study appeared to be most effective for two participants, Cherin and Louise: Jasmine and David presented with the least success. One of the main reasons for this disparity was the issue around intervention implementation and parental non-compliance. The analysis of parents’ compliance with intervention procedures (i.e. parental presence) showed that three of the five participants did not follow the requirements as closely as desired. This meant that in two cases, the intervention phase was extended, by parental request, in order to achieve a successful outcome. Despite limited changes in Jasmine’s sleep problem behaviours, her parents chose not to continue the intervention after the intervention phase. Those participants who showed the greatest improvements appeared to be from families with less confounding issues, such as fewer family stressors and less parental anxiety.
The changes in Trait-Anxiety were unexpected as ratings are meant to stay relatively constant. Only State-Anxiety is meant to increase or decrease. This may have been due to the timing of the intervention, which was over school end and holidays.

Of high concern is the number of children whose depressive symptoms, as self-rated on the CDI, increased over the time. Due to this, and where parents were not satisfied with outcomes for the sleep intervention, referral to other agencies was offered.

**General Discussion**

Simonds and Parraga (1984) stated that children who experience anxiety at night often displace their anxieties as fear of the dark. This was true for four of the five participants here. Jasmine was the only participant who appeared to ruminate and become anxious about daytime events. Wilson and Haynes (1985) described ruminating on past experiences as one characteristic of children presenting with psychophysiological insomnia. They also characterised children as presenting with somatic complaints, which may have been the cause of Cherin’s physical complaints.

The solutions and coping strategies that children with night fears use were outlined by Muris, et al., (2001) as more avoidant behaviours, such as seeking support from parents. These coping behaviours were also displayed by each of the five participants in this study as can be seen from baseline data where for a high proportion of nights the children engaged in bedtime resistance and parental presence. This, along with the likelihood of heightened physiological arousal, meant that their sleep was often delayed. These behaviours were the main aetiological factors in sleep disturbances in children who are anxious (Garland, 2001). Also according to Garland there was a further possibility that these anxious responses can be conditioned responses with bedtimes.

Many of the parents appeared to be overprotective of their child and limited opportunities for their child to be exposed to feared situations. Being able to avoid their anxieties and obtain parental presence instead reinforced children. This contributing factor to
the development and maintenance of anxiety was outlined by Vasey and Dadds (2001). White (1985) further explained this as a “fears life support system” where parents emphasise their ability to protect the child resulting in the child relying more on the parent rather than developing their own coping strategies. This was most noticeable in David where he required his father to check on all nightly noises to the extent of checking the outside yard.

A factor that may have contributed to Jasmine’s ruminations was her early bedtime. It appeared that her current bedtime was not her natural time of sleep onset and parental expectations may have been too high with regards to the total hours of sleep required for a girl of her age. This meant that Jasmine was sent to bed early but was unable to sleep and therefore used the time for thought and imagination to the extent of worrying herself more. This possibility was discussed by Ferber (1996). While Jasmine’s parents were provided education on developmental sleep requirements, they chose not to change Jasmine’s bedtime.

Another point raised by Ferber (1996) was the possibility that the child may not have any real fears and may instead use this complaint as a stalling tactic. This strategy may have been used by some of the participants in this study to an extent, however further investigation would be required to determine this.

*Comparison with other Literature*

No other studies were found addressing interventions for school-aged children with sleep difficulties and anxieties at night. Indeed no studies could be found on interventions with typically developing school-aged children with sleep difficulties alone. Most of this literature has been conducted with infants and adults. Studies on children with night time fears was the closest comparison. These studies aimed at reducing children’s anxieties at night, specifically focusing on fears of the dark, however, they do not consider the co-occurrence of sleep disturbances and the effects these might have. Despite this, limited comparisons to this literature can be made.
The current study used a multiple baseline design as did McMenamy and Katz (1989), Friedman and Ollendick (1989), Ollendick, et al. (1991), and King, et al. (1989). This design is useful in research using small participant numbers where control groups are not possible. Changes occurring only after the intervention is implemented are attributed to the success of the intervention.

Literature on children with night time fears has used intervention components such as relaxation training (e.g., Graziano & Mooney, 1980), self-control statements (e.g., Friedman & Ollendick, 1989), and reinforcement contingencies (e.g., Ollendick, et al., 1991). These components were also utilised within the intervention strategies in the current study. Reinforcement contingencies were a main component of each participant’s intervention. The effect of reinforcement on behaviours is most notable with Shane after his initial reward structure was altered and better structured. It was at this point that reductions in bedtime resistance, parental presence, and sleep onset time were most notable. Relaxation training was provided for each participant, however, this was only used by Cherin. Self-control statements were provided for David as part of his intervention but these were not used consistently.

The current study also utilised extinction, stimulus control, bedtime fading, sleep hygiene, and parent education, advice, and support in the treatment of the sleep disturbances. However, these intervention components have only been studied in other literature with young children, especially the use of extinction and stimulus control (Owens, et al., 2002). Treatment phases used within research with infants requires a shorter time span as behaviours are easier to change and are not as entrenched. Infants lack the same verbal and cognitive skills and are less able to get out of bed as school-aged children.

Behaviour management strategies such as logical consequences were also used for children who displayed non-compliance, specifically for Jasmine and David. While such Triple P strategies have been found to be effective with a wide range of children (Sanders, 1999), it did not appear to be effectively applied for these participants.
There are no studies that have used the same combination of intervention components as were used in the current study. Nonetheless, intervention outcomes in literature on children with night time fears are still comparable.

Graziano and Mooney (1980) used relaxation training, pleasant imagery, self-control statements, and reinforcement in treating school-aged children with severe nighttime fears. Their intervention phase was over a period of 3 weeks. Treatment for success was based on criterion of ten fearless consecutive nights. Results showed improvements in sleep onset and bedtime resistance. Maintenance was found in all children except one at 12 months and at 2 1/2- 3 year follow-ups. Two children had regressed but not to baseline levels of fear and continuation of night-time fearful problems. One child who showed no improvements remained fearful 3 years later.

The current study had an initial set intervention phase length of 4 weeks, however, for three participants this was extended, in one case, to 10 weeks. Improvements were also displayed in sleep latency time but only one participant showed improvement in the reduction of bedtime resistance. Maintenance was only found for two participants at a 6-week follow-up. Two children had also regressed on levels of self-rated anxiety but not to baseline levels. One child, David, also showed no improvements in anxiety ratings and ratings actually increased during intervention then reduced slightly at follow-up of but not to the same level as baseline.

While McMenamy and Katz (1989) used a younger participant group, aged 4-5 years, than this current study, there are similarities between the two. They used extended multiple baselines. The current study made use of extended baseline information in order to provide more information on levels of baseline behaviours. This was especially useful as baseline data across all behaviours was extremely variable. McMenamy and Katz (1989) discovered that children displayed variable fear ratings and while the trend was clearly showing a reduction in fearful behaviour during intervention, there were good nights and bad nights during all phases of the study. They stated that while this variability makes a clear interpretation of cause and
effect relationships difficult, it may be a common feature of the age of the children. This variability in ratings was also shown in the current study, however, it appeared to be common across self-ratings of anxiety and sleep onset.

A criticism of the McMenamy and Katz (1989) study was the overlooked aspect of change at intervention being attributed to therapist contact. This response may have occurred in the current study with Cherin, as at first meeting she was requiring parental presence all night, however after this meeting and before baseline recording was able to begin, Cherin was moved out of her parent’s room and into her brother’s.

These comparisons with other literature are very limited due to a slightly different focus to this study. Despite this, important comparisons in the similarities and differences are made in the design, intervention components, and outcomes.

Limitations

Limitations of Measures

Reliance on parental reports for sleep diary and intervention integrity presents a major limitation. All participants had missing data, whole nights and nightly records of specific behaviours. Two participants lost their diaries, one a parent’s record and the other the child’s records. The parent’s diary records were misplaced and never found. No effort was made to start a new record so a new diary was provided. The child participant was able to start a new record halfway through the intervention phase. As these data provided the basis for intervention analysis, inconsistent results meant that no clear trends could be accurately attributed to the intervention. The structure and format of the sleep diaries may have been a key factor in parental recording. The sleep diaries were a bound and lined notebook with a list of behaviours to record at the front. It was up to parents to check that they were recording all the behaviours that were required each night. Despite reminders about diary recording during telephone contact with the researcher, many parents missed whole nights to whole weeks.
Notes taken during telephone contact were used to fill in some of the missing data. Suggested changes to the diary structure and procedure are outlined in the section

**Implications for Future Research**

The resulting reliability that was obtained provided a more limited analysis than was originally designed, that is comparison of telephone contact and diary records only. Even if reliability had been completed independently by both parents, relying on them not to ask or copy the other person is a risk. Another issue was that it was mainly the mother who dealt with bedtime issues, the father would not be as aware of specific behaviours and actions taken. This was shown for a couple of participants where the father was the only person to fill in a record for a night, and when compared to the mother’s records, provided incomplete information. However, as previously noted this may have been a limitation of the diary design in obtaining more specific, accurate details.

The administration of the CBCL on three different occasions meant that parents were required to complete an extensive questionnaire, covering a wider range of behaviours than just anxiety and depression. A parental measure obtaining only their perception of their child’s anxiety and depressive symptoms could have been given instead. There may also have been a risk of possible practice effects due to repeated administration. As well as difficulty in applying the questions specifically to the period of time since the last administration.

The STAIC–State questionnaire was administered to each child for assessing their level of anxiety for the previous night at baseline, post-intervention, and follow-up. However, in looking at each participant’s nightly self-rated level of anxiety on Figure 2, ratings were extremely variable. Therefore, a once-off rating on the State questionnaire would be dependent on the previous night’s anxiety and might not be an accurate portrayal of level of anxiety over, say, nights in the previous week.
Limitations of Experimental Design

Due to a delay in obtaining participants, follow-ups could not be scheduled at the original length of 3 months. This meant that follow-ups occurred in a shorter time span and therefore there were limitations in assessing the long-term outcomes of the intervention. Two participants, Shane and David, had extended intervention phases, and due to time constraints, follow-ups were only 3 weeks from intervention. This is not an ideal follow-up length, however, despite this, data collected at follow-up for these two participants indicated an increase in problem sleep behaviours within even this short time.

As this is not a longitudinal study, the long-term effects of sleep disturbance, anxiety, and the implication of the development of depression cannot be determined. Therefore, the results from this study can only be considered preliminary.

The use of a control group or waiting-list group could be used to determine to what extent these problems change over time. This would also account for the effects of therapist contact on behaviour before intervention. Therefore, improvements in targeted behaviours could more easily be attributed to the intervention.

As a collection of strategies was employed, it is unclear which aspects were effective and which were not. This provides limitations for future researchers and those in professional practice wishing to employ these strategies.

Limitation of Intervention

The timing of when the intervention was implemented was poor. The intervention phase for all participants was towards the end of school and over Christmas school holidays. This was a time of increased stress and pressure on families with an increase in commitments and activities. Therefore, there were fewer family routines and it was harder for families to maintain set bedtimes. Children were allowed to spend nights with a friend or, in Shane’s case, he spent an extended time staying with his father where the intervention was not being implemented. These issues created barriers to successfully implementing a consistent
behavioural intervention. In some cases, this may have been a contributing factor to the need to extend the intervention phase. However, extending intervention phases appeared to create additional factors such as increased parental non-compliance with diary recording.

The intervention relied heavily on parental understanding of the basic, applied principles of learning theory, reinforcement contingencies, escalation/coercion traps and a child’s avoidance of feared stimuli in order for the parent’s to see their role in maintaining the child’s sleeping problems and anxieties and their role in intervening. These principles need to be fully explained in simple language with the use of practical examples to aid in understanding. According to Owens, et al. (2002), if parents lack understanding of these concepts they often have difficulty in complying with implementing particular strategies appropriately or consistently. This can lead to no improvements or in fact may make the original problems worse. Therefore, due to parental issues with non-compliance and extended intervention phases in this current study, it may be that a clear understanding of the principles were not held by these parents. More time may have been required on the initial parent education.

The settings for each of the interviews were in the individual family homes. This presented as a limitation in that there were distractions and interruptions within the home for the child or the parent. Some interviews had to be extended in order to cover the questions or points necessary. This was probably most important for the intervention meeting where understanding of complex concepts and precise application of strategies was required. In one case, this meeting took place while the mother was preparing the evening meal and the material had to be covered again later. A clinical office would be a preferable meeting place to limit distractions for the family and focus the directions of the meetings.

Therapist contact with the family during the intervention phase was limited to daily phone calls as required and an additional meeting, in two cases, to implement a second step. Some participants appeared to need more intensive support to facilitate parental compliance and perhaps shorten intervention times.
Other studies have suggested treating the child’s anxiety and fears first before treating the sleep difficulty. This may be useful with clients who have extreme fears. However, some children may notice that talking about their fear elicits parental attention and therefore, may talk about fears in the absence of anxiety. For these children, the use of behavioural strategies may be more effective.

*Implications for Future Research*

There are several important questions raised by this study that would benefit from further investigation by research.

There is a need more research focusing on the link between sleep and anxiety and the development of depression in primary school-aged children, as currently there is very limited empirical research. There are also limited studies focusing primarily on sleep problems in typically developing school-aged children. These topics are especially important as research indicates that sleep problems early in life are predictive of long-term sleep problems if not identified and intervened. There is also a need to develop an efficacious sleep program for these children and age groups. These programs need to be acceptable to parents in order to minimise child and parent distress and non-compliance, and therefore, parental adherence.

With all the effects on the parents and subsequently the family environment, it could be suggested that the child with the sleeping disturbance may feel, or be made to feel, either directly or indirectly an enormous amount of guilt for being the cause of such disharmony within the family. Is this a possible role in the development of depression? Or does depression precede the sleep disruptions?

There are two links that need to be addressed: first, the causal role of sleep deprivation in leading to depression, and secondly, the causal link between anxiety and depression, with anxiety often being a precursor to depression. Does the combination of both sleep deprivation and anxiety increase the risk for the development of depression and cause earlier onset? Or are they both steps in the process towards depression?
As discussed previously, one of the main limitations of this study was the structure and procedures involved in the recording of sleep diaries. As this was the main mode of data collection, it was crucial to have nightly records of each of the behaviours being measured for data analysis. Suggested changes for future researchers using parental diaries would be to have diaries set out so that each day is on a separate page with everything that is required to be recorded and spaces for parents to fill in the information. To prevent substantial loss of data, collecting diaries weekly would mean that if data were lost, it would only be for one week.

This study did not address issues of the implications of changes in the targeted behaviours over extended time and the effect of therapist contact before intervention. These could have been addressed by the use of a control group. No satisfaction measures with the form of intervention were obtained from parents. Therefore, it is not known if this was an acceptable intervention for parents as this is an important component for parental compliance. However, due to the poor compliance of participating parents’ with the intervention requirements, it could be speculated that there was some dissatisfaction. Comparative research of the different intervention components would provide information on what strategies and/or combination of strategies are effective.

The importance of parental education needs to be addressed, as this is another factor that can lead to parental non-compliance with interventions when they do not fully understand the importance of maintaining factors and the specific strategies that target this. In the case of this study, it was crucial that parents had a good understanding of the development and maintenance of sleep and anxiety problems and their potential role in this. The application of intervention strategies such as extinction and reinforcement contingencies also needs to be thoroughly explained so that successful outcomes are more likely.

The long-term outcomes of family behavioural interventions would also benefit from longitudinal study. As can be seen from the participants, David and Shane, follow-ups indicated that their improvements had not been maintained. Do family behavioural
interventions have long-term maintenance or does the family return to their previous way of dealing with their child’s behaviours?

*Implications for Professional Practice*

This study provides practitioners with an intervention option for school-aged children who have sleep difficulties and anxiety, which may be effective. However, this study was designed to target specific behaviours, therefore, families that were not dealing with other issues were able to focus their resources on this intervention in order to have a successful outcome. In using this intervention, a practitioner may have to work first with other environmental issues, for example, marital conflict, maternal depression, or even other behaviours of the child, for example teaching the basics of behaviour management.

By successfully treating a child’s sleeping difficulties, previous research has indicated that there are benefits to the family in addition to child. Eliminating these problems can lead to better family functioning, concerning improved parental sleep, less stress within the family and even improved marital relationships. Therefore, in working with families that present with difficulties, treating the child’s sleeping difficulties may mean that other issues resolve.

This study utilised a cost-effective intervention for parents with minimal practitioner face-to-face contact, however, ongoing phone contact is required. This means that it may be more readily accepted as an intervention choice for families with limited finances and practitioners within agencies that are required to deliver cost-effective interventions.

As discussed earlier, the importance of parental education for intervention compliance appears paramount for successful treatment.

As research suggests, sleep problems are linked in with many behavioural, emotional, and cognitive difficulties. If sleep problems can be overcome, this may prevent other agencies dealing with the effects of sleep deprivation (e.g., school), exacerbation of anxiety and possible development of depression for the child (e.g., mental health).
Conclusion

In conclusion, it appears from these preliminary results that a relationship between sleep and anxiety does occur. The use of a behavioural family intervention in the treatment of these problems showed mixed results, appearing most successful in reducing participants’ self-ratings of anxieties, followed by reductions in parental presence and sleep onset latency. The co-occurrence of depression was indicated and symptoms decreased for those children whose sleep behaviours and anxiety problems improved. However, no firm conclusions are able to be drawn from the findings of this study.

The findings of this study would be of interest to researchers due to the paucity of research on sleep and anxiety within this age group. The importance of intervening with children presenting with sleep difficulties and anxieties, in order to prevent long-term negative outcomes, is also of interest to researchers and practitioners. These initial findings may also be of interest to society at large concerning the possible development of depression if sleep and anxiety problems are not addressed. This is particularly relevant within New Zealand, due to the high suicide rate as these children move closer to the age group at risk.
REFERENCE LIST


1 August 2002

Melissa Presnall
C/o Dr Karyn France
Department of Education
UNIVERSITY OF CANTERBURY

Dear Melissa

The Human Ethics Committee advises that your research proposal “Sleep Problems in Anxious Children: A Behavioural Family Intervention” has been considered and approved.

Yours sincerely

[Signature]

Blossom Hart
Secretary
Sleep Problems in Anxious Children: A Behavioural Family Intervention

Information Sheet

I am currently being trained to be a Child and Family Psychologist. As part of my Master of Education course (Child and Family Psychology) I am required to undertake a research project that involves working with parents and their child(ren) and helping them to overcome some of the problems they may be having. I have chosen to focus on helping children with sleep problems who are anxious at night.

This research is focused on children who have difficulty settling and going to sleep, waking in the night and difficulty going back to sleep because they have worries or anxieties which keep them awake.

My supervisor, Dr Karyn France, will be helping me with this project. I will meet with you, formulate a plan and keep contact with you and your child over a period of several weeks. I will also check in with you at a later date to see how things are going for you and your child.

We will plan some strategies to help you deal with your child’s sleep problem and to help your child to overcome their anxiety at night. This may involve teaching your child how to relax and a coping plan that will help them deal with their anxious thoughts and settle to sleep easier.

Please note that any child management intervention may be slightly stressful but the aim is, in the longer term, to decrease the stress you are feeling about the worrying behaviour and to help your child.

I will ask you and your child to keep a sleep diary each night. Your child will also be required to record how anxious they are feeling.

Any information you give to me is confidential. The only exception to this is if there is reason to believe that any one of you in your family is in danger. If this happens, professional ethics requires that I talk to my supervisor who will contact you and discuss what steps will be taken to ensure safety.

Thank you for considering taking part. If you have any queries or concerns do not hesitate to contact either myself, Dr Karyn France (senior supervisor) or Dr Kathleen Liberty (second supervisor).

Melissa Presnall 352 5565 (home) or 021 137 1157 (cell)
Karyn France 364 2610 (Univ) or 343 2935 (home)
Kathleen Liberty 364 2545 (Univ) or 358 2232 (home)
Parent Consent Form

I/we have read and understand the description of Melissa’s programme in the information sheet. On this basis I/we agree to being participants in this study.

In agreeing to participate in this study I/we will follow the procedures required to the best of our ability.

I/we consent to Melissa writing up her findings and submitting them to Dr France with the understanding that anonymity will be preserved and any notes will be destroyed when the report is submitted.

I/we consent to the discussion being audio-taped.

I/we understand that we are free to withdraw, with our child, from the programme at any point, including withdrawal of any information I/we have provided.

Signed: 

Date: 

Parent 

Parent 

Researcher 

Names and Contact Details:

Child’s Consent Form

(Parent may read to the child)

Melissa has talked to me and asked if she can talk about some of my worries that I have when I go to bed and help me to be able to cope with them and get to sleep easier. I understand that I may be asked to keep a sleep diary and keep a record of how I am feeling. I understand that I do not have to do or say anything I don’t want to.

Her teacher, Dr France, will be working with Melissa to help her, my parents, and me.

What I say and what I put in my diary will be included in Melissa’s research but will not have my name on it and she will not keep any notes about me after her research is finished.

If I change my mind at any stage I don’t have to continue.

I know that what I say may be tape-recorded.

I agree to take part in this project.

Childs Full Name

Child to Sign 

Date
Parent Interview

Presenting Problem

Can you describe your concerns about your child?
How serious do you consider the problem to be?
When did you first notice the problem?
How long has this problem been going on?
Where does this problem occur?
When does this problem occur?
How long does it last?
How often does it occur?
What happens just before the problem begins?
What happens just after the problem begins?
What makes the problem worse?
What makes the problem better?
What do you do when the problem occurs?
Has this been successful?
What do you think is causing it?
Was anything significant happening in your family when the problem first started?
Do any other children in your family also have the same problem?
Has your child been assessed or received any help for the problem?
What progress has been made?
How have things changed for your child?
How have things changed for you?

Where does your child sleep?
Do they share a room?

Reason for seeking services now.

Review of child’s 24 hour sleep-wake pattern

Evening
What time is the child’s last meal?
What activities typically take place between then and getting ready for bed?
Does he/she taken any sleep medicine?

Going To Bed
Who gets the child ready for bed and how?
Is it always the same person and done in the same way?
Is there a bedtime routine?
If so, what is the sequence of events?
Does it include a wind-down period?
What time does he/she go to bed?
What time would you like your child to go to bed?
Is he/she put to bed awake or asleep?
Where and how does he/she fall asleep (own bed, parent’s bed, downstairs, being rocked, nursed or fed, with or without parent present)?
Does he need a bottle, dummy or special object to fall asleep or want someone else to sleep with?
Parental soothing strategies
Child’s self-soothing strategies.
Does he express fears about going to bed?
What is the sleep environment like? – Lights, temperature, noises, door closed or open?
Does he have his own room?
Is the bedroom conducive to sleep or is it a place for entertainment or other arousing experiences?
Does he have any unusual experiences when going off to sleep?
Exactly what happens if he will not go to bed or does not go to sleep readily?
Who deals with the problem and how consistently?
Night-Time
Does the child wake during the night?
If so, when and how often?
Does he get up in the night to go to the toilet or to have a drink?
Is he able to return to sleep easily or does he need his parents or join them in their bed?
If so, what precisely happens, who is involved and what is the result?
Is the child’s sleep disturbed in other ways e.g. restlessness, sleep talking, sleep walking, head banging
or rocking, teeth grinding, nightmares or terrified episodes, jerking or convulsive movements or other
episodes of disturbed behaviour?
How often do these things occur and at what time of night: how long do they last and does he seem
awake at the time?
What do his parents do?
Does he snore or have difficulty breathing when asleep?
Does he wet the bed?
What is his usual period of continuous sleep?

Waking
What time does the child wake up?
What time would you like your child to wake?
For how long has he slept?
Does he wake up spontaneously or have to be woken?
Is he very difficult to awaken?
Does he look tired?
Is he irritable and in a bad mood?
Does he have any unusual experiences and how does he feel between waking up and getting out of
bed?

Daytime
Is the child drowsy or does he sleep during the day?
If he sleeps, can he resist doing so and does he fall asleep when engaged in activities?
What are the number, duration and timing of naps?
Do his muscles become weak when he laughs or is upset or surprised?
Does he find it difficult to concentrate?
Has his performance at school deteriorated?
Is he overactive, irritable or depressed?
Are there any unusual episodes during the day?
What is the total time spent asleep each 24 hours?

Environment
Tell me what your home is like?
Who lives at your home?
What is your neighborhood like?

Relationships
How does your child get along with his/her siblings?
Does your child have friends?
How well does your child get along with their friends?
Does your child usually go along with what their friends want to do, or are they more likely to do what
they want to do?
How does your child get on with you and/or your partner?
How does your child express their affection towards you?
When something is bothering your child, who do they confide in?
Who is responsible for bothering your child?
How are they disciplined?
Do you have any concerns about how other adults interact with your child?

Cognitive and Academic Functioning
How well does your child learn things?
Does your child seem to be quick or slow to catch on?
How are they doing at school?
What are their best / worst subjects?
Are you generally satisfied with their achievement in school?
Any special classroom placement, special education services.
What is their behaviour like at school?
What is their peer interactions like at school?
Are they excessively sleepy at school, falling asleep in class?

Emotional Functioning

What kind of things does your child worry about or become anxious or afraid?
How do they behave when they feel this way?

Developmental History

What was life like to the parents prior to the child’s conception
How was the pregnancy and birth
How did the mother feel immediately after the child was born.
What, if any, was the father’s reaction/involvement.
What was the infant’s behavioural style (irregular, fussy, difficult to console or easy to soothe, regular eating, sleeping, bodily functions).
Was there a lot of crying in the first few months
How was the baby fed, why
How did the parents adjust to the type of baby they had
How did siblings adjust
Milestones -- sitting, crawling, standing, walking, sleeping through, talking, awareness of gender, toileting, dry beds
Did the child show developmentally appropriate separation anxiety
How did your child adjust to i.e. birth of a sibling, change in family financial status, death, divorce, family move, change of schools, change in sleeping arrangements.
How was the child’s social adjustment, adjustment to day care, pre-school, school
Describe history and current relationships with others and with friends and siblings
Describe the child’s personality (mood swings, even, angry outbursts, nervous habits)
Who are the other significant people in the child’s life.
Does your child take any prescription/psychoactive medications (including medications used for sleep).
What daily exercise or activities does your child do.
Has your child experienced any traumatic events i.e. accidents, physical or sexual abuse.

Assessment of the Parents

For each, how do the (did they feel or seem) “in themselves” (anxiety, depression, sleep disturbance, difficulties with anger control, difficulties setting limits or looking after themselves)
Have they been under stress
How do they describe their and their partners family of origin
What effects did this upbringing have upon them
How has this affected their decisions about parenting
How does their actual parenting compare with their ideal parenting
Observe how they relate to their child
What is their emotional tone
Have they other concerns about their child
With other children in the family
Any other concerns e.g. juggling work and parenting, financial, family
What are their sources of support
Child Participant Interview
(Adapted for each child and their individual sleeping difficulties)

Presenting Problem
Has anyone told you why I’m here?
What were you told?
Tell me about your sleeping?
When did you first notice that you had difficulty with your sleeping?
How long do you think it’s been going on?
Where do your sleeping difficulties happen?
Does it occur at friends’ houses?
When do your sleeping difficulties happen?
Does it happen before bedtime, at bedtime, when you’re in bed, during the night, in the morning?
Does it happen when one of your parents is with you?
How long does it go on for?
How often do you have sleeping difficulties?
Is it 3-4 times a night, once a night, 2-3 times a week, once a week etc?
What happens just before you have sleeping difficulties?
What do you do about it?
What do your parents do?
What makes the problem worse / better?
What do you think caused the problem?
Was anything happening in your family when your sleeping difficulties first started?

School
What’s school like?
How do you get along with your teacher?
What subjects do you like best / least?
Do you think that you are at the top, middle, of your class or do you struggle a bit?
Who do you play with / hang around with at school?
What do you do during break times?
Do you have any trouble hearing what your teacher asks you to do?
Do you have any trouble seeing what is on the blackboard?
Do you find it hard to concentrate?

Home
Who lives with you at home?
Tell me what your home is like?
Do you have a room of your own?
How do you get along with your father / mother?
What does he/she do that you like?
What does he/she do that you don’t like?
How do you get along with your brother / sister?
Do your parents treat you and your brother / sister the same?
Who disciplines you at home?
How do they discipline you?
How do your parents tell you or show you that they like what you have done?
When you have a problem, who do you talk to about it?

Interests
What hobbies or activities do you like doing?
Do you play any sports?
Do you belong to any clubs?
What are your favourite TV programmes?
Friends
Do you have any friends?
How do you feel when you are with your friends?
How are your friends treating you?
Who is your best friend?

Mood / Feelings
Do you have different feelings during the day?
Have you been feeling more nervous or anxious?
What kinds of things make you feel happy / sad / angry?
What do you do about these?

Fears / Worries
Most children get scared sometimes. What do you get scared about?
What do you do?
Do you have any special worries?

Self-Concept
What do you like best / least about yourself?
Tell me about the worst thing that has ever happened to you.

Somatic Concerns
Tell me how you feel about your body.
Have you been sick a lot?
Do you ever get headaches / stomach-aches / body pains?
Do you take any medicine?

Obsessions and Compulsions
Some children have thoughts that they think are silly or unpleasant or do not make sense, but these thoughts keep repeating over and over in their minds. Have you had thoughts like this?
Some children are bothered by a feeling that they have to do something over and over even when they don’t want to do it. For example, they might keep washing their hands or keep checking something before they can do something else. Is this a problem for you?

Thought Problems
Do you ever hear things that no one else hears that seem funny or unusual?
Have you had experiences that seemed odd or frightening to you?

Aspirations
What do you plan on doing when you are grown up?
If you could do anything you wanted when you became an adult, what would it be?

Three Wishes
If you could have three wishes right now what would they be?
How nervous, scared, frightened, worried, or anxious do I feel?
### Cherin's Assessment Measures T-scores and Percentile Ranges

<table>
<thead>
<tr>
<th>Assessment Measure</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
<th>Follow-up</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mother</td>
<td>Father</td>
<td>Mother</td>
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<td></td>
<td>T</td>
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### Key
- Clinical Range
- Borderline Clinical
### David’s Assessment Measures T-scores & Percentile Ranges

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**Key**
- Clinical Range
- Borderline
- Clinical
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- Borderline
- Clinical
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**Key**
- Clinical Range
- Borderline
- Clinical
Shane’s Assessment Measures T-scores & Percentile Ranges

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| %ile Range              |                  |                   |           |           |           |            |
| State                   |                  |                   |           |           |           |            |
| Trait                   | 44               | 27                | 42        | 22        | 50         | 49         |

| CDI                      | 56               | 83                | 56        | 83        | 53         | 75         |

**Key**
- Clinical Range
- Borderline
- Clinical