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An Exploration of Children's Dental Anxiety: Triggers, Coping and Needs

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Rosemary Jane Watson

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Abstract

Visiting the dentist can induce feelings of intense anxiety in many people. Such people often seek to limit their anxiety by avoiding dental treatment. Avoidance can then lead to major dental problems that require invasive and possibly painful treatment and reinforcing the individual's dental fear. Very few studies have been conducted into children's experience of the dental visit in their own words. The aim of the present study was to do this by exploring three aspects of the dental experience. These were the factors in the dental environment that trigger dental anxiety, the coping strategies children use to deal with dental anxiety, and what children's needs are that would enable them to cope better. Interviews were conducted with 54 children aged between 7-11 years. Thematic analysis was used to analyse the children's accounts. The findings revealed that a number of factors trigger anxiety in children; children use a wide range of coping strategies to deal with anxiety and pain while at the dentist and there are a number of needs children have during dental treatment that are not being met. Implications for these themes for dental training, education and interventions are suggested.

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Introduction

Dental anxiety

Overview

Dental fear and anxieties are exceedingly common in both children and adults. Studies have reported prevalence rates of severe dental anxiety to be around 5% and moderate dental anxiety to be between 20-30% (de Jongh, Muris, Ter Horst, Duyx, 1995; Thompson, Stewart, Carter & Spencer, 1996). However, most adults will admit to feeling at least some level of anxiety or apprehension before and/or during a dental visit. This study has three aims. The first is to investigate the factors present in dental treatment that children find upsetting and difficult to cope with. Many people believe they have an understanding of what makes dentistry so frightening but very little research has gone into this.

The second aim is to explore the coping strategies children use when attending the dentist. The coping strategies adults use while in the dental situation have been explored in a number of studies using a number of different designs and techniques (e.g. van Zuuren, de Jongh, Beekers, & Swinkles, 1999; Bernson, Elfstrom, Berggren, 2007). However the coping strategies children use while at the dentist have not been explored to the same degree and there is a lack of qualitative research in the area. Qualitative studies in particular can offer rich information that cannot be accessed through traditional quantitative methods. Due to this lack of research this review will be broad in focus and will cover the areas of dental anxiety as well as the general area of coping before focusing more specifically on the existing research involving children's dental coping strategies.

The final purpose of this study is to explore what children believe needs to change during dental care which will help them to cope better with dental anxiety and pain. Research that has allowed children to voice their needs concerning dental treatment is rare or non-existent, however it is important. Studies have indicated that dental

anxiety is most likely to develop in childhood and is often due to negative dental experiences (Liddell, 1990; Klingberg, Berggren, Carlsson, & Noren, 1995; Milgrom, Mancl, King, & Weinstein, 1995). Therefore if we gain an understanding of what types of experiences are causing anxiety and of what children think would help them, we can work towards ensuring children have increasingly positive dental experiences and therefore reduce the instance of dental anxiety.

This introductory chapter will begin by providing the relevant background to the present study. A discussion about the state of oral health in New Zealand and how dental anxiety is connected to this will be presented first using examples from current research. The concept of dental anxiety and fear will then be introduced and the literature concerning this will be examined. The concept of coping and the literature around this will then be examined. Finally, a more detailed exploration of the literature surrounding the coping strategies and techniques children use while in a dental situation will be discussed including a review of a number of studies, many of which use different methods to explore children's dental coping strategies.

Oral Health in New Zealand

A recent survey conducted by the Ministry of Health found that less than half of New Zealand's five year olds are free of tooth decay (Ministry of Health, 2009). The results also indicated worrying inequalities in oral health between ethnic groups and those with access to water fluoridation. There is no current data concerning New Zealand adult oral health available although there is evidence to suggest that adult oral health status can be predicted from oral health at age 5 (Thompson, Poulton, Milne, Caspi, Broughton, & Ayers, 2004). However figures may soon be available as the Ministry of Health has funded a nationwide survey to assess oral health in New Zealand which began in March 2009 (Ministry of Health, 2009). These figures suggest that New Zealand's oral health is not in a good state.

The Ministry of Health has reacted to these findings by developing a new strategic vision of oral health in New Zealand which will focus first on child and adolescent oral

healthcare services. Although there has been a recent focus on improving the oral health of New Zealand children the bigger challenge will become continuing these improvements into and throughout adulthood (Murray and Pitts, 1996). The need for this is highlighted by research which indicates that less than 50% of 26 year olds are regular users of dental health services in New Zealand (Thompson et al., 2004). It is unknown what reasons adults have for not attending regular dentist appointments but it is likely that many of us do not attend as the idea of it induces feelings of anxiety and apprehension.

Oral health tends to be viewed by many as being separate and not as important as other aspects of physical health. Healthy teeth and oral tissue are however essential for our everyday wellbeing and functioning. Poor oral health can put our ability to eat, speak and communicate in jeopardy and can cause great discomfort and embarrassment (Kent and Croucher, 1998). The Ministry of Health views oral health as a priority and has plans to channel millions of dollars of public spending to improve this aspect of New Zealander's health.

The strong suggestion that many New Zealanders are not getting the dental care they require and an understanding of why this is the case need to be investigated. Kent and Croucher (1998) suggest that factors such as the cost of treatment, dental practice environment, and dental fear or anxiety can all be considered as barriers to dental care for a number of people. A British study by Todd and Lader (1991) attempted to shed some light on what barriers 3500 British adults believed were stopping them from receiving effective dental treatment. The majority (45%) of participants rated statements relating to dental fear as being the biggest barriers. 11% believed there were no barriers, 22% saw cost as being the biggest barrier, and another 22% believed that aspects of the dental practice organisations caused barriers to seeking care. The study also found a correlation between the presence of dental fear and poor dental health. These findings support the idea that dental fear poses a significant barrier to dental care.

A study looking at the relationship between oral surgery attendance and dental fear found a negative relationship between dental fear and attendance rates for scheduled

oral surgery. A similar relationship was found between fears of pain in general and attendance rates. This suggests that dental fear does contribute to the avoidance of dental treatment but also highlights the importance a fear of pain has in dental fears (Vowles, McNeil, Sorrell, et al., 2005).

Conceptualisations and Definitions of Fear, Anxiety, and Phobias

The terms fear, anxiety, and phobia are closely related and often used interchangeably by a number of authors, although many attempts have been made to distinguish between them. Freud viewed fear as initiated by something external, specific and known by the individual. Anxiety however was viewed by Freud as being internal to the individual and the cause of the anxiety could be unknown and non-specific (Freud, 1959). Lazarus (1991) defines fear as involving the belief of impending harm and anxiety involving a threat that may not exist.

The Diagnostic and Statistical Manual (DSM –IV-TR) distinguishes between fear and anxiety in a similar way. Fear is seen as having a protective function. It enables us to react quickly to imminent threat by helping us to either escape or attack, also known as the flight or fight response. Anxiety is defined as “the apprehensive anticipation of future danger or misfortune accompanied by a feeling of dysphoria or somatic symptoms of tension (American Psychiatric Association, 2000, p. 820).

Even though both anxiety and fear are defined here differently they are related. The experience of anxiety can reduce the level of threat needed to produce a fearful response by increasing vigilance towards threatening cues. Reacting with fear and anxiety to threats and threatening situations is normal and necessary for organism survival although there are times when fear and anxiety are not always adaptive. Many people experience fear and anxiety when faced with things or situations that in reality are of little risk to their wellbeing. When these unreasonable fears reach levels where an individual’s everyday living is impaired or they experience significant stress, the fear is no longer serving an adaptive purpose. In such cases a diagnosis of a specific phobia or anxiety disorder is likely justified.

A phobia is a fear that is initiated by a specific stimulus. The DSM-IV-TR defines a phobia as a

“marked and persistent fear that is excessive or unreasonable, cued by the presence of a specific object or situation (e.g., flying, heights, animals, receiving an injection, seeing blood).” (APA, 2000).

As well an individual must recognise that the fear they hold for the object or situation is unreasonable and attempt to either avoid it or endure it with high levels of distress. What also makes a phobia distinct from fear is that it is intrusive enough to interfere with daily life. It also is out of control of the individual and leads to the avoidance of the feared stimulus or, when avoidance is not possible, it is endured with intense fear and anxiety (APA, 2000).

As everyone reacts differently to visiting the dentist, some people can be categorised as experiencing emotions including dental fear, anxiety or a phobia, depending on the severity of their reactions and emotions felt towards the dental visit, and some people may even report liking it. Most of us probably display some level of fear or anxiety but this does not become a phobia until it impacts on our ability to attend dental appointments.

An Overview of Dental Anxiety

There are no clear accepted diagnostic criteria available which outline what is a normal or abnormal level of fear experienced in dental settings (Prins, 1994). This makes defining dental anxiety extremely difficult. However, a number of questionnaires and tests have been developed to measure dental anxiety in adults and children (e.g., Frankl’s rating scale (Franckl, Shiere & Fogels, 1962); Melamed’s Behaviour Profile Rating Scale (BPRS, Melamed, Weinstien, Hawkes & Katin-Borland, 1975); Dental Anxiety Scale (DAS, Corah, 1969); Children's Fear Survey Schedule - Dental Subscale (CFSS-DS, Cuthbert & Melamed, 1982; Smiley Faces Program (SFP, Buchanan, 2005)). Examples of these will be discussed later.

For the purposes of this research dental anxiety will be defined as strong feelings of anxiety and fear experienced when thinking about or attending a form of dental care that results in actively seeking to avoid the experience or displaying phobic reactions. Those who experience dental anxiety view their reactions as unreasonable, may not be able to explain them, and have little or no control over their actions. An example of someone experiencing dental anxiety would be when a patient feels extreme nervousness when thinking about a future dental appointment which is days away, experiences strong feelings of fear when attending an appointment, and will only attend the dentist in an emergency which they cannot ignore.

As a number of studies have found that dental anxiety poses a significant barrier to dental treatment, further discussion in this area is required.

Dental fear and dental anxiety have become the focus of much research over the last 20 years. Studies, conducted both in and outside of New Zealand, have looked into prevalence rates of dental anxiety in the general population and have come up with figures ranging from 5%-19.5% (Milgrom, Fiset, Melnick, & Weinstein, 1988; Milgrom, et al., 1995; Murray, Liddell, & Donohue, 1989; Poulton, Thomson, Brown, & Silva, 1998). This strongly supports the idea that dental anxiety is a major cause of low rates of adult attendance at dental appointments.

The finding that people who experience dental fear tend to have poorer oral health than those with no fear suggests that many fearful patients will avoid seeking dental treatment at all or until they are at the stage where the problems they are experiencing can no longer be ignored. Once oral health problems reach this stage they usually require invasive and often painful procedures. Such procedures are likely to reinforce a dentally fearful patient's desire to continue avoiding the dentist, which continues in a vicious cycle. The situation could be very different if the patient attends the dentist on a regular basis, as problems may have been spotted and treated earlier with less invasive treatment.

From this point of view it is easy to see why as children it is important for everyone to learn adaptive and effective ways of coping with dental fear and anxiety.

Prevalence Rates of Dental Anxiety

The Dunedin Multidisciplinary Health and Development Study is one of very few New Zealand studies to investigate dental anxiety and fear (Poulton, Waldie, Thomson, & Locker, 2001) and has provided some insight into the its prevalence and development in New Zealand. In this study different measures of dental fear and anxiety were taken when participants were 15, 18 and 26 years of age. When the participants were 26 years, 20.6% were classified as having dental fears and 21.4% experiencing dental anxiety. These figures are comparable with other prevalence studies completed in New Zealand and around the world (Milgrom, et al., 1988; Milgrom, et al., 1995; Murray, et al., 1989; Poulton, et al., 1998). The study also investigated the acquisition of dental fears and compared the differing risks associated with the development of early versus late onset dental fears. This study and its findings will be discussed in more depth in the following section.

Psychological and Interpersonal Aspects of Dental Treatment

Why is it that so many people are afraid of visiting the dentist? Dental treatment does not normally pose any real danger to us and many people who suffer from dental anxiety admit that their feelings are irrational (Willumsen, 2004). However there are a number of aspects of dental treatment that contribute to the anxiety many feel when undergoing such treatment.

Fear of Pain and the Unknown

Many people associate dental treatment with pain and see this as a cause of their dental anxiety. The mouth and oral tissue contains a high number of pain receptors and even with anaesthetic techniques some dental procedures will lead to some feelings of pain in the patient (Willumsen, 2004). A study by Maggrias and Locker (2002) investigated the number of participants who reported experiencing pain while

attending a dentist appointment in the last five years. They found that 42.5% reported pain and 19.1% rated the level of pain experienced to be moderate to severe. Vassend (1993) completed a similar study but found that 60% of the participants reported experiencing pain during their last dental appointment and more than 20% reported the pain intensity to be moderate or worse.

There appears to be a relationship between level of anxiety and the level of pain reported during dental treatment. A study by Versloot, Veerkamp, and Hoogstraten (2008) into children's self reported pain during dental treatment found that children who were dentally anxious reported more pain than those who were not rated as dentally anxious. This could be because anxious children are more focused on the pain than children who are more relaxed. Others suggest that local anaesthesia is less effective in highly anxious dental patients (Fiset, Getz, Milgrom, & Weinstein, 1989). This may mean that anxiety reduces the effectiveness of anaesthetic or that such patients are difficult to administer injections to and this is why dental fears have developed (Willumsen, 2004). There is also evidence to suggest that people who are dentally anxious also appear to remember the dental experience as being more painful than non-anxious people (Kent, 1985).

If dental pain is experienced by children it can become an issue when it is ignored or denied by the dentist or parent. They may have been told that they were acting 'silly' and this can contribute to the negative associations they hold with visiting the dentist (Chapman & Kirby-Turner, 2005).

A fear of the unknown could also contribute to anxiety related to dental treatment. It is not uncommon to not know what will need to be done during a dental appointment before going, and therefore every visit can be seen as potentially threatening. Children who have not been to a dental appointment before and have not received adequate information are likely to find the situation frightening (Petersen, et al., 1978, cited in Willumsen, 2004), especially as it is likely they have heard from others that dental treatment is painful (Townend, Dimigen & Fung, 2000).

Intrusion and Loss of Control

In order to receive effective dental treatment it is necessary for a patient to position themselves in such a way that the dentist can have easy access to the inside of their mouth. This may make a patient feel vulnerable and less in control of the situation. A dentist also requires a light to be shone into the patient's mouth so as to get a clear view. A bright light shining into a patient's face can limit their view of their surroundings, which again can lead to feelings of loss of control and vulnerability.

A patient's personal space needs to be invaded by the dentist during treatment. A comfortable distance between two people is about 1-1.5 metres. If this space is not maintained people often start to feel slightly stressed and may react defensively (Willumsen, 2004). Not only does dental treatment involve an invasion of personal space that continues into the mouth, it also involves touching.

Younger children can easily become frightened by dental instruments. Sucking instruments that can often get stuck to the skin inside the mouth during procedures can be very frightening, especially if the child does not understand how the device works and what it is for. A fear of being sucked up by the device is not uncommon in younger children and could be considered the ultimate intrusion (Chapman & Kirby-Turner, 2005).

Some studies have reported that patients fear choking during dental procedures (Abrahamsson, Berggren, Hallberg, & Carlsson, 2002). As we use our mouths to breathe in air, if our mouths become blocked, as they often do during dental treatment, panic may ensue and along with defensive reactions.

Feelings of a loss of control during dental treatment can for some people contribute to the development and maintenance of dental fears. Many studies have shown that a high level of perceived control in stressful situations leads to reduced stress and averseness (Baron & Logan, 1993; Thompson, 1981). Sartory, Heinen, Pundt, and Johren (2006) found that a perceived lack of control over the dental situation and a desire for high levels of control was the best predictor of avoidance in dentally phobic patients.

Another intrusive aspect of dental treatment is that during the examination the possibility that the dentist will criticise the patient's teeth-cleaning routine or diet and be told off which can damage the patient's self-esteem and self worth (Chapman & Kirby-Turner, 2005). It is likely that the anticipation of such criticism could contribute to the anxiety felt when attending a dental appointment.

When we consider all the aspects mentioned above together it is easier to understand why dental fear is so common. Despite this, qualitative studies exploring individual patient's experiences of dental treatment are rare. The present study aims to explore what features of the dental experience children find upsetting and difficult to cope with by using a qualitative approach to gain a richer understanding.

The Origins of Dental Anxiety

A great deal of research and theorising from many different perspectives has gone into understanding the origins of fear and anxiety. The majority of research into dental anxiety has been studied within Rachman's three-pathway theory of fear acquisition (1977). Rachman developed this theory because of the inability for classical conditioning to account for all human fear acquisition. There are three pathways to fear acquisition under this theory. Classical conditioning theory is represented in Rachmann's theory as the direct conditioning pathway, which includes causes such as negative previous experiences and the poor attitude and treatment from dentists. The other processes are the indirect pathways of modelling and negative information. The three-pathway theory fits with many of the research findings into the development of dental anxieties.

Another important approach to understanding the development of dental anxiety is the individual approach. This view of the development of fear and anxieties looks at the individual differences that can leave some more prone to acquiring fears. Such differences as temperament, cognitive style, age, gender, SES, perceived efficacy, culture, family practices and level of available support have been shown to impact on

the development of dental anxieties. These ideas will be enlarged on later in this project.

Direct Conditioning Pathway (Past Experiences)

A significant relationship between past negative dental experiences and the development of dental anxiety has been found in many studies of differing populations which have used a number of designs and methods (Poulton et al., 2001; Abrahamsson, et al., 2002; Ten Berge, Veerkamp, Hoogstraten, & Prins, 2002). Such experiences that occur during childhood have been shown in a number of studies to have a particular impact on the development of dental anxiety.

Poulton et al. (2001) investigated the factors contributing to the early and late development of dental anxiety as part of a longitudinal study of a group of children born in Dunedin in 1972 and 1973. Participants completed measures of dental fear and dental anxiety at the age of 15, 18 and 26. Information was collected regarding their dental experiences and their level of oral health. The findings of the research indicated that negative dental experiences later in life were strongly related to the late-onset of dental anxiety in the participants. A relationship was also found between negative dental experiences and the early-onset of dental anxiety, though this was not as strong as the late-onset.

A qualitative study investigating dentally phobic individual's views on their dental anxiety and experiences was conducted by Abrahamsson, et al. (2002). From in-depth interviews with 18 dentally-phobic individuals it was found that most participants accounted for their development of dental phobias with one negative dental experience occurring in childhood. This event was most often described as painful and the treatment from the dentist as rough.

Ten Berge et al. (2002), in their study into the etiology of childhood dental fear, found that the sequence of dental experiences may have more influence on the development of dental anxiety than the experience of invasive procedures alone. These authors found a weak yet significant relationship between the number of extractions

experienced by a child and their level of dental fear and no relation between fear level and the number of fillings. However, the findings of this study indicate that children who received more check-up appointments before their first invasive procedure were less likely to develop dental fears than those with fewer check-up experiences. This theory has also been supported by other clinical studies (Davey, 1989; de Jongh et al., 1995). This parallels with exposure therapy techniques that are commonly used to treat phobias and other anxiety disorders in clinical settings. Exposure therapy is characterised by gradually exposing the client more and more to the feared stimuli until the fearful response is extinguished or has decreased to a manageable level (Farmer and Chapman, 2008). If a child is anxious and yet they attend the dentist many times without experiencing pain, eventually the fear may diminish as it does in exposure therapy.

A number of studies have also highlighted the impact dentists' attitudes and behaviours, or children's perceptions of these, have on the development of dental anxiety (Townsend, et al., 2000; Ten Berge, 2004). Townsend et al. (2000) reported that the more dentally anxious children in their sample were more likely to report less empathetic behaviour from their dentists. Ten Berge (2004) suggests that painful procedures combined with the perception of an empathetic dentist is more likely to result in the development of dental anxiety than a painful dental experience alone.

There are however some problems with the methods used in many studies that report a relationship between past negative dental experiences and the development of dental anxiety. Many of these studies have relied on retrospective measures, some of which rely on participants recalling such experiences from their childhood. Subjective methods such as parental reports and child's self reporting via questionnaires are very common forms of data collection and cannot always be relied upon to provide valid or reliable results. Other studies that have used treatment records or oral health status to measure conditioning have not provided support for the theory.

Indirect Pathways

(A) Modelling and parental experience

A number of studies have reported a relationship between exposure to modelling of dental fear from others and the development of dental anxiety in children. However, after a more detailed analysis of the research, the relationship between modelling and dental fear becomes less clear. Many studies look at the correlation between parental fear and child fear and do not attempt to investigate a causal relationship. Many studies fail to measure parental dental fear during a dental appointment and rely on self reports or measures of anxiety while their children are undergoing dental treatment.

Townsend et al. (2000) reported a positive relationship between a mother's dental anxiety and her child's. However, though the relationship was found to be significant, it was weak. The authors also described a positive relation between the mother's state of anxiety and the child's level of fear during the child's dental appointment but pointed out that this was likely due to feelings of empathy towards the child. The children were mostly unaware of their mother's anxiety, thus providing further support against the theory of modelling and parental experience having an impact on dental fear.

(B) Negative Information

The final pathway in Rachman's theory of fear acquisition is the transference of negative information about dentists and dental visits. Many people have heard terrifying stories of dental procedures and children often pass these stories on to each other at school and it is therefore easy to believe that such stories might have an impact on the development of dental anxiety in some people. However, only a small number of studies have attempted to investigate this.

In the qualitative study by Abrahamsson et al. (2002) a number of participants identified the receiving of negative information about dental treatment from others as having an impact on their development of dental fears. In one example, a woman remembers seeing her mother covered in blood after having her teeth

removed and believed that this could have contributed to her development of a dental phobia.

Townsend et al. (2000) described the transmission of negative information about dental fear from mothers as playing a minor role in the cause of dental fear in children. The evidence used to reason this was that a positive correlation was found between the mother's and child's reported level of anxiety. It is possible that a genetic disposition could essentially account for this finding and not the social learning processes such as the transmission of negative information or the modelling of dental fear by others (Kent, 1997).

Individual Approach (Temperament or cognitive style)

Children with shy, introverted temperaments that show signs of behavioural inhibition have been shown to be more susceptible to the development of a number different anxiety disorders (Grant, Bagnell, Chambers, & Stewart, 2009). Studies have also shown support for this in regard to the development of dental anxiety (Poulton et al., 2001; Ten Berge & Veerkamp, 2005; Klingberg & Broberg, 2007).

Poulton et al.'s (2001) longitudinal studies report evidence that suggests individuals' temperaments can also influence the development of dental anxiety in early life. Participants with personalities that left them vulnerable to fear were more than seven times more likely to develop dental fear before the age of 18 than those with less fearful personalities. Vulnerable personalities were those that displayed nervousness, sensitivity, and were prone to worry.

A review of the literature regarding the relationship between dental anxiety and dental behaviour management problems was published between 1982 and 2006. This review identified a clear relationship between temperament and dental anxiety, and temperament and dental behaviour management problems (Klingberg & Broberg, 2007). Seven studies which looked at the relationship between dental fear and temperament were reviewed. The authors concluded that there was strong support for the view that dental anxiety is more likely occur in children with the traits of

shyness, inhibition and negative emotionality. Dental behaviour management problems were found to be more likely associated with the temperamental traits of activity and impulsivity.

A more recent study that investigated the role of emotional and behavioural problems in the development of dental fears in children found that children with internalising problems such as somatic complaints and withdrawal were more at risk of developing dental fears than other children (Ten Berge & Veerkamp, 2005).

Coping style has also received some attention from researchers concerned with the individual differences that impact on the development of dental anxiety in children. Coping styles such as monitoring, the focusing on negative aspects of the dental situation and the use of negative self talk have indicated poor adjustment to dental treatment (Prins, 1985), whereas the tendency to use strategies such as cognitive rephrasing, blunting, and focusing on the positive aspects of dental treatment seem to lead to better adjustment and less anxiety (Ten Berge, 2004). However, there appears to be some inconsistency in the findings between studies in this area. A more detailed review and discussion of the literature surrounding dental anxiety and coping strategies is included later.

Cognitive Behavioural Approach

The cognitive behavioural approach to dental anxiety describes its development as a vicious cycle. It starts with the patient feeling threatened by the dental experience or thinking about it. The patient's body then responds to these thoughts with the activation of the autonomic nervous system. This causes the body to increase its heart rate, blood pressure and sweating. The patient's muscles will also tense up. The theory then explains that these bodily sensations are misinterpreted as signs of an imminent threat which causes the patient to begin thinking catastrophic thoughts and therefore increase their feelings of terror and the cycle continues. Such situations will likely result in the patient attempting to avoid future visits to the dentist. The avoidance itself can lead to another continuous and vicious cycle. When a patient avoids dental

treatment for sometime it is likely that their oral health will suffer and become poor. Because of this the patient will likely develop feelings of shame and guilt and will continue to avoid visiting the dentist. Alternatively avoidance will lead to deterioration in oral health leading to the need for invasive and probably painful dental treatments which will again reinforce the patient's desire to continue avoiding dental treatment in the future (Willumsen, 2004).

Development of Dental Anxiety - A Review of the Literature

As discussed above there are a number of methodological and conceptual problems surrounding the literature on dental anxiety and its development. Studies investigating the causes of dental anxiety have produced mixed results, making it very difficult to draw clear conclusions regarding causes (Ten Berge, 2004). Most of the studies mentioned above that have investigated the etiology of dental anxiety have relied heavily on retrospective self reports from participants. This method can lead to errors and bias entering the data. Much of this research has been correlation and therefore a causal relationship cannot be found, which again means the value of the data is limited.

Dental Anxiety Measures

A number of measures have been developed in recent years that aim to assess levels of dental anxiety in adults. More recently a focus has been on developing dental anxiety measures made specifically for children.

Children's dental anxiety measures come in a range of techniques. Self report questionnaires, self reports from parents or dentists, behavioural and physiological observations, and projective methods have all been used by different studies. Self report questionnaires appear to have many advantages over the other measurement techniques. They are relatively easy and quick to administer and analyse, and they are usually flexible and inexpensive to use. Norms from different populations can easily be developed, therefore allowing comparisons to be made between cultures and

populations. Many self report questionnaires can be modified for a parent to complete when a young child is not able to (Ten Berge, 2004).

There are several self reporting questionnaires measuring children's dental anxiety. The CFSS-DS is one of the most commonly used self report measures for which norms have been developed for a number of countries (Ten Berge, Veerkamp, Hoogstraten & Prins, 2002). This scale was developed especially for children. Another scale, the DAS, was originally developed for the assessment of adult dental anxiety but has been modified for the assessment of children. This scale includes 8 items to assess children's concerns about specific dental procedures and has been shown to be a reliable and valid measure of children's dental anxiety (Wong & Humphries, 1998).

The questioning format of both the CFSS-DS and the DAS, which require the child to rate statements numerically, may be too difficult for younger children to complete competently (Howard & Freeman, 2007). This limitation of the CFSS-DS and DAS scales has led to the development of measures which use pictorial response scales instead of numerical based scales.

The SFP is a computer based measure which uses pictures of faces with varying expressions as a response scale and children must decide which expression best represents their feelings towards dealing with four different dental situations. The SFP has also shown good levels of reliability and criterion validity (Buchanan, 2005). The novelty of being computer-administered may also be an advantage as children want to complete it.

Behavioural registrations such as Frankl's rating scale (Franckl et al., 1962) and the BPRS (Hosey & Blinkhorn, 1995) have also been used to assess dental anxiety in children however there are disadvantages associated with using only behavioural assessment of dental anxiety. It is hard to separate dental fear from behavioural management problems, the child's temperament, coping ability and effect of the dental situation on the basis of behavioural assessment alone (Ten Berge, 2004). A child may not express their dental anxiety through their behaviour just the same way as a child who is acting out during dental treatment may not be dental anxious (Klingberg et al., 1995).

Dental Anxiety Treatments and Coping Skills

A number of studies have begun investigating the effectiveness of different forms of treatment aimed at reducing levels of dental fear in child and adults.

Research into the use of cognitive behavioural approaches to the treatment of dental anxiety in adults has shown them to be effective (Getka & Glass, 1992). This form of therapy combines behavioural strategies, such as relation training and gradual exposure, with cognitive techniques, such as attention control and positive self talk, to help teach clients ways of overcoming and managing their fears effectively. Education and homework also play a part in CBT treatment for dental anxiety. Studies into the effectiveness of CBT therapy with children with dental anxiety have also reported positive results (Ten Berge & Veerkamp, 2005). Teaching children to use cognitive coping strategies alone has also been successful in reducing children's dental fears when compared with children who received no training (McMurray, Bell, Fusillo, Morgan & Wright, 1986).

Other studies have assessed the impact of specific coping training such as modelling, distraction, and perceived patient control. Distraction was found to reduce levels of anxiety in children in a number of studies (Stark, Allen, Hurst, Nash, Rigney, & Stokes, 1989). Peer-modelling via video-tape has been shown to be an effective way of reducing anxiety and increasing co-operation in children during dental treatment. After children had watched a video of other children using different coping strategies they reported less anxiety than those who did not (Melamed, Yucheson, Fleece, Hutcherson, & Hawkes, 1978; Klingman, Melamed, Cuthbert, & Hermezc, 1984). Modelling was found to be more effective if children were asked to practice the strategies while watching the video (Klingman et al., 1984).

More recent attempts have been done to teach children coping strategies which match their coping style (Christiano & Russ, 1998). This technique has shown limited success for participants who experience high levels of anxiety (Christiano & Russ, 1998). However, Seigal (1998) notes that it is important that children are given time to practice the skills and are exposed to the strategies for sufficient time in order for

them to be effective. This is a possible reason for inconsistent findings between studies.

A different approach to the management of dental anxiety that does not include strategy instruction was investigated by Shapiro, Melmed, Sgan-Cohen, Eli, & Parush (2007). They looked at the impact a sensory adapted dental environment (SDE) had on reducing anxiety in children. SDE is created by using dimmed lighting, vibroacoustic stimuli and deep pressure. A significant reduction in the level of anxiety was seen in patients who experienced SDE compared with those in the traditional dental environment.

Coping

In the previous section the nature of dental anxiety was discussed. In this section the literature investigating the coping strategies children use to deal with the anxiety and pain caused during dental treatment will be reviewed.

This section will begin with an introduction to coping and its importance in life. The concept of coping will be defined and conceptual aspects of children's coping discussed. A review of the literature regarding the coping strategies children use during dental visits will follow, including a discussion of the methodological issues inherent in the literature concerning children's coping.

Introduction

Children's coping and the types of strategies they use to deal with stressful situations has become the focus for an increasing number of researchers. In the last 20 years the number of studies relating to this area has increased steadily. This may have coincided with a change in understanding of the experience of childhood. Previously many believed that childhood was a safe time when little stress was experienced. Now it is widely accepted that childhood can be a very stressful time and the traumas experienced in childhood can have a major impact on us for the rest of our lives (Murphy & Moriarty, 1976). Increasingly, parents wish to shelter their children from traumatic situations but there are times when this is not possible and children must develop their own ways of coping. Children who are protected from many stressors may fail to develop the coping skills that are required to deal with stress involved in everyday life as an adult. This may result in them becoming vulnerable to such stressors (Murphy & Moriarty, 1976). It is also widely accepted that many of us grow and gain strength from dealing with stress and would suffer from boredom and its associated emotional, cognitive and somatic problems if we were never to experience stress. This is supported by the desire of many of us to actually seek out stress and stressful situations in the form of risk taking and adventure sports (Lazarus and Folkman, 1984). This highlights the fact that stress and therefore coping are a part of

everyday life and the development of adaptive coping skills is necessary for us to live a happy and fulfilling life.

Coping – A Definition

Lazarus and Folkman (1984) define coping as the “consistently changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141). This theory of coping forms the basis of many studies into children’s coping even though it is based on adult coping research (Skinner & Zimmer-Gembeck, 2007). Known as a transactional approach, this theory highlights the context and the attempt to cope and views coping as a dynamic and ever-changing process that is affected by the environment, the individual and their interactions with each other. Coping is seen as a process in that it is always changing and therefore varies depending on the specific situation or context a person is coping with or within, and also means that the type of strategies used to cope can change while dealing with the same stressor. For example, it may be necessary for a person to use different coping mechanisms when dealing with the loss of a loved one from when one is visiting the dentist. In the case of someone dealing with bereavement, the coping process is likely to continue for some time and within that time the ways they will deal with the emotions and stress will vary. Such changes occur when the relationship between person and environment changes. Lazarus and Folkman (1984) use the concepts of appraisal and reappraisal to explain such changes. Appraisal occurs when the individual evaluates the situation and assesses what significance it has on their wellbeing. Reappraisal occurs when new information regarding the situation is introduced to the individual and therefore they must re-evaluate what the impact will be on the individual’s wellbeing.

A coping episode can be defined by breaking it down into the coping response, the coping goal and the coping outcome. The coping response is an intentional act, either physical or mental, that is initiated in reaction to an apparent threat. The coping goal is the aim or purpose of the coping response, which will usually include a reduction in the stress or other negative aspect of the threat (e.g. pain) (Lazarus and Folkman,

1984). The coping outcome is the direct result the coping response has had. The outcome depends on the coping response and goals and whether the response was successful or not depends on what the coping goal was (Lazarus and Folkman, 1984).

A spontaneous coping response to a threat is a stress reaction, not a coping response which is always intentional. Because the situations and resources available to a person vary with every coping episode, there is an almost endless number of specific coping strategy examples (Skinner & Zimmer-Gembeck, 2007). A review by Skinner, Edge, Altman and Sherwood (2003) found over 400 different labels of coping strategy categories.

There are a number of alternative ways of categorising coping styles and strategies. Behavioural versus cognitive coping separates the behavioural coping strategies such as muscle relaxation or tension and cognitive strategies such as positive self speech. Behavioural strategies can be measured via observation or self report whereas cognitive strategies can only be assessed using self report (La Greca, Silverman & Lochman, 2009). Folkman and Lazarus (1988) categorised coping strategies as problem-focused versus emotional-focused coping. Problem focused coping refers to the coping strategies aimed at changing the threatening or stressful situation whereas emotional focused strategies are those that aim to make the emotional consequences of the situation more bearable.

The approach versus avoidance type of classification measures coping along a continuum from seeking to approach the perceived threat or stressor to avoiding it. Information seeking versus information avoidance is a similar way of categorising coping but instead focuses on either the seeking out of information about the threat or trying to avoid all information related to it. High and low monitoring, or blunting versus monitoring, is another way of grouping coping strategies and is similar to those mentioned above. This theory explains why predictability sometimes reduces stress and sometimes increases stress as well as accounting for the individual differences in people's preferred coping styles. It attempts to account for why some people when in a stressful situation prefer to know what is about to happen and seek out information (monitoring) and why others like to be distracted from the negative event (blunting).

Miller's theory states that everyone has a dispositional coping style where they either lean towards blunting or towards monitoring strategies when faced with an unpleasant situation (Miller and Grant, 1979).

Blunting can include spontaneous internal techniques such as thinking about something else, using positive self talk, intellectualising and re-interpreting the event. Blunting strategies can also employ external tools such as listening to music, reading, or working on a puzzle or mathematic problem (Miller and Grant, 1979). Monitoring strategies include anything that involves focusing and finding out more information about the event or situation. Examples of such strategies include asking questions related to the procedure or situation, hypervigilance and seeking out information on when they may experience pain or discomfort (Miller and Grant, 1979).

Primary versus secondary coping is yet another way coping strategies have been differentiated. This method separates coping strategies into 3 categories. First are primary controls which are actions that are intended to change the events or conditions. Second are secondary controls which are designed to adjust one's own behaviours or cognitions to the demands of the situation. Relinquished control is when no coping strategies are employed (Weisz, McCade & Denning, 1994).

Skinner et al. (2003) argue that single function distinctions (such as blunting versus monitoring) are not good ways of categorising coping strategies because coping instances are multidimensional and serve many purposes. They therefore suggest that action types are better ways of categorising. After reviewing 100 studies assessing coping, they developed a list of thirteen categories that represent the most of the coping strategies used. These include problem solving, information seeking, helplessness, escaping, self-resilience, support-seeking, delegation, social isolation, accommodation, negotiation, submission, and isolation. Skinner and Zimmer-Gembeck (2007) found that children and adolescents tend to rely mostly on just 4 of these families; support-seeking, problem solving, escape and distraction.

Coping Measures

The two main methods for assessing coping are observation and self report. Many studies assessing coping strategies have used both methods and take advantage of the benefits both offer. Observational methods have the advantage of allowing more than one observer's assessment which increases the reliability of the data. The data also avoids bias and other problems associated with self reporting.

Self reporting has many advantages over observation. It allows for the measurement of cognitive coping strategies such as self speech and thought stopping. It also identifies subtle strategies that cannot be viewed via observation. Although optimal, very few studies investigating dental coping have utilised the advantages both methods offer by employing both methods to collect data (Miller, Sherman, Combs, & Kruus, 1992).

There are a number of specially designed measures that assess children's coping during dental procedures. The Cognitive Coping Interview (CCI) was developed by Curry and Russ (1985) as a tool to systematically measure children's cognitive coping strategies employed during stressful dental visits. The CCI consists of 12 questions and is administered immediately following the dental procedure. The children's responses are classified into six different categories which are reality-oriented working through, positive cognitive restructuring, defensive appraisal, emotion regulating cognitions, behaviour regulating cognitions and diversionary thinking.

The Child Behaviour Style Scale (CBSS) was developed by Miller (1987). It is designed to assess the tendency for children to use a monitoring or blunting style of coping when faced with a threatening or stressful situation. It is not used to measure coping in the dental situation specifically. The scale includes four uncontrollable and stressful situations and each situation has eight coping options, half which are monitoring strategies and half which are blunting. The child is asked which strategies they are would use when in each of these situations.

In most studies investigating the coping strategies children use in the dental situation, pre-validated or designed scales or interviews were not used and, if they were, the

original measures were usually altered. Instead, most researchers designed their own interview questions or questionnaires. Even though many of the questions were based on theory and research there is still such great variation in the terminology and use of categorisation. This makes comparisons between studies extremely difficult. Skinner et al. (2003) support this with their findings from analysing over 100 coping studies and failed to find two studies that used the same categorisation systems. Furthermore some studies used just two or three different categorisations and others used up to 30. In total, a list of over 400 labels was found for coping strategies. This is likely the cause of the slowed progress within the coping field (Skinner et al, 2003).

Compas, Conner-Smith, Saltzman, Harding Thomsen, and Wadesworth (2001) reviewed the progress and issues within child and adolescence coping research. Included in this was a review of questionnaires, interviews and observational coping measures. These authors state that the high number of differing measures used and the lack of agreement between studies in terms of classification in approaches to measurement also contribute to the difficulty in integrating and comparing findings between studies on coping. The authors suggested that the questionnaires reviewed often lacked clarity and specificity in their items, researchers did not differentiate between coping goals and strategies and there was often an overlap in assessment of coping and psychopathology. A smaller number of interview measures aimed at investigating children's coping are available; these were identified as being able to provide richer information and understanding (Compas et al., 2001). However, there can be problems with retrospective interviews as they rely on the child's memory and therefore can underestimate the number of coping responses used. This can be overcome slightly by employing a more structured interview schedule that provides good prompting. Observations were found to be useful for the validation of self reports but provide limited assessment of cognitive coping strategies.

Conceptualisation and Methodological Issues in Childhood Coping Literature

There are a number of conceptualisation issues present in the literature surrounding coping in childhood and adolescence. Issues involved in the categorisation of coping

strategies and coping measures have been briefly addressed above but will be discussed in more detail in this section. There are also a number of methodological issues rife within coping research.

Inconsistency in Definitions and Operationalisation of Elements

It is evident within the literature regarding children's coping that there is inconsistency with respect to its conceptualisation (Compas et al., 2001). Of major concern is the lack of a clear model of coping that accounts for the impact developmental stages have upon coping in children, adolescence and adults. Many theories of coping are based only on research with adults and do not account for the cognitive, social, and physiological changes that occur as part of natural development and therefore alter the way we cope with stressful situations (Compas et al., 2001). Examples of these are the development of meta-cognitive skills in middle childhood which enables children to use self-talk, the move away from a close parent-child relationship and the increased importance of peer relationships that occurs in late childhood and adolescence. These developments alter the coping strategies an individual will adopt during this phase.

A lack in consistency in conceptualisation can also be seen in the different names and labels given to coping strategies in different studies in the area. This has resulted in an impossibly large number of categories and strategy labels between studies, making it virtually impossible to make comparisons between studies (Skinner, et al., 2003). However, recent developments in the area have highlighted the complex and multi-dimensional nature of children's coping and a general consensus views simple, single dimensional models as insufficient. These models are not complex enough to differentiate between the many different coping responses children have in stressful situations. Hierarchical models including first order and higher order dimensions appear to have more support from researchers in the area but further work is needed to develop theoretically significant dimensions that clearly reflect childhood coping (Skinner, et al, 2003).

Methodological Issues in Children's Coping Research

This lack of consensus towards a conceptualisation of children's coping has also led to problems in the approaches to measurement. There are now individual measures that have been developed for specific studies in the area (Christiano & Russ, 1996; Miller, Roussi, Caputo & Kruus, 1995). This has meant that comparing and integrating findings from different studies has been very difficult and therefore drawing clear conclusions about children's coping has not been possible. If more of a consensus can be developed regarding the concept of children's coping then more standardised measures can be created and therefore make it possible to make comparisons and increase our understanding of children's coping (Skinner et al., 2003).

Factors Impacting on Children's Coping Skills

Factors such as stage of development, age, coping style, and level of anxiety all appear to impact on the types of strategies children employ during stressful situations such as dental treatment.

Studies investigating children's coping have suggested that a child's developmental stage and age impacts on the types of strategies they employ (Melamed et al., 1978; Curry & Russ, 1985; Van Meurs, Howard, Versloot, Veerkamo, & Freeman, 2005). These studies have found that older children are more likely to employ cognitive based coping strategies whereas younger children rely more on behavioural strategies (Van Meurs et al., 2005). Literature concerning child development helps to explain and support this finding as cognitive control does not start to develop until children reach middle to late childhood (Jensen, 1971). Other studies have focused on children's preferred coping styles. Miller et al. (1979) report that people tend towards monitoring or blunting styles of coping and this tendency will impact on the types of strategies they employ and how effective they are for them.

A relationship between the level of dental anxiety a child experiences and the coping strategies they use has also been reported (Versloot, Veerkamp, Hoogstraten, & Martens, 2004). Children experiencing higher levels of anxiety have been found to use

more strategies and are more likely to use internally based coping methods (Versloot et al., 2004). Prins (1985), reports that highly anxious children use negative self talk strategies more often than non-anxious children during dental treatment. Another study found that children with low levels of dental anxiety used more cognitive strategies and those with high anxiety used more behavioural strategies (Curry & Russ, 1984).

Children's Coping Strategies during Dental Visits

The previous sections introduced coping, discussed the many definitions, models and theories concerning children's coping, and looked at coping measures and conceptual and methodological issues present in the study of children's coping in general. This section will now focus on children's coping with dental stressors specifically. Previous research investigating the coping strategies employed by children during dental procedures will be the main focus here. A review and discussion of specific studies will be included. The chapter will be divided into the different studies' findings regarding behavioural and cognitive coping strategies. A general critique of these studies will follow.

To date very few studies have published findings concerning the coping strategies children use while attending a dental appointment. Many children have to cope with high levels of anxiety that may begin well before entering the dental clinic and continue throughout the visit. During invasive procedures children may also employ coping strategies to deal with pain and discomfort. As discussed earlier, the strategies children use will depend on a number of things. Developmental stage, coping style, and level of anxiety will all have an impact on the tools a child has available to cope with the stresses of the dental situation.

Coping Strategies Identified in Literature

Most studies have focused their investigations on both the behavioural and cognitive coping strategies children use during dental treatment (Curry and Russ, 1985; Prins,

1985; Miller et al., 1995; Versloot et al., 2004; Van Meurs et al., 2005). However, as mentioned previously, studies in this area differ in their classification of the different coping strategies which makes comparisons between studies difficult. Despite this, this section will discuss and attempt to compare the findings from these studies.

Curry and Russ (1985) explored the coping strategies used by children during stressful dental procedures. Data was collected by observing and interviewing 18 children aged 8-10 years. Observations were made during dental procedures and the interviews were conducted immediately after the procedure. The authors classified the coping strategies identified into behavioural and cognitive strategies. Three behavioural strategies were identified; these were Information Seeking, Support Seeking and Direct Efforts to Maintain Control. Information Seeking is defined by the authors as “Attempts to obtain information by asking questions, vigilant watching, feeling the inside of mouth, or inspection of the instruments” (Curry & Russ, 1985, p. 63). This category is separated into the subsets, questioning behaviour and vigilant behaviour. Support Seeking includes the subcategories of physical contact and verbal contact which the authors define as “attempts to establish a supportive relationship with the dentist or assistant, involving verbal and/or physical contact” (p. 63). The final behavioural category is Direct Efforts to Maintain Control. This is when the “child attempts to actively participate in the treatment process or to set limits (Curry & Russ, 1986, p. 63). It includes the subcategories Active Participation and Limit-setting. From here a behavioural coping measure called the Behavioural Coping Observation Scale (BCOS) was developed using the three behavioural strategies and six sub-categories described above. This scale is designed to measure the behavioural coping efforts of children during dental treatment. Data is collected using 1 minute time-sampling observations. The researchers then used the BCOS to analysis the behavioural strategies used by their sample of children during dental treatment. In this study every child observed attempted to cope with the treatment by employing at least one behavioural coping strategy. One hundred percent of the sample used information seeking strategies, 60% used direct efforts to maintain control and 56.7 % employed support seeking strategies. From this study it appears that behavioural coping strategies are not the most effective techniques at improving children’s adjustment to

the dental situation. It also suggests that in some cases behavioural strategies can be related to poor outcomes (Curry and Russ, 1984; Curry, Fuss, Johnsen, & DiSantis, 1988).

In the same study Curry and Russ (1985) attempted to identify the cognitive strategies children use when undergoing stressful dental treatment. After conducting interviews with 18 children immediately following dental procedures six cognitive coping strategies were identified. These were reality-oriented working through, positive cognitive restructuring, defensive reappraisal, behaviour regulating coping cognitions, emotion regulating coping cognitions, and diversionary thinking. In this study all of the children described used at least one way of coping and most children reported using a variety of different methods. More cognitive strategies were identified by the children than behavioural. The data from this study suggests that the older children differed from the younger children in the types of coping strategies used. The older children in the sample tended to use cognitive strategies more than the younger children in the study and were less likely to seek information. Older children also tended to use a wider variation of cognitive strategies and were more likely to use positive cognitive restructuring strategies.

The tendency for older children to use more cognitive rather than behavioural strategies is supported by a study by Van Meurs et al. (2005). This study also investigated the coping strategies used by children when attending a dental appointment and the efficacy of the strategies. The influence of age, gender, level of dental anxiety, pain, and the number of caries on the type of coping strategies employed was also looked at. The authors used convenience samples of 380 children aged between 11-12 years from Northern Ireland (NI) and the Netherlands. The participants completed the DCQ which assesses their coping style and the perceived efficacy of the strategies used. The children's dental anxiety was measured using the CFSS-DS. The pain children had experienced during dental treatment was also assessed. This was done with a specially designed questionnaire. The results indicated that a wide variety of coping strategies were used by the children in the sample. Cognitive strategies were, in general, used more often than behavioural strategies and were rated by the children as being the most effective. Analysis of the results

supported the view that younger children use more behavioural strategies than older children, especially strategies that involved seeking emotional support from others. Comparisons between the Dutch (NL) and Northern Irish (NI) samples showed that the NI children more often used behavioural strategies than the children in the NL sample. The NI sample displayed higher scores on the dental anxiety measure and a higher number of NI children were classified as dentally anxious. NI children reported more painful dental experiences than the NL sample did. The authors believe these results indicate that children with higher levels of dental anxiety are more likely to rely on behavioural coping strategies. They also suggest that children who experience painful dental treatment earlier in life are more likely to develop dental anxieties.

Van Meurs et al.'s (2005) study does, however, have some limitations. The ages of the children in the samples range from 11-12 years. As the influence of age on the choice of coping strategy was being investigated, a wider age range may have provided more information. As well, the children's dental health was not directly assessed; it was just inferred from statistics that the NI population would have poorer dental health than the NL population. Therefore the differences found between the groups could have been due to cultural factors rather than dental health status.

Self speech and self regulation are examples of cognitive coping strategies. Prins (1985) investigated the use of self speech and self regulation in children when visiting the dentist. Forty children aged between 8 and 12 years were assessed by a semi-structured interview to determine if they used self speech or self regulation during dental examination. Highly dentally anxious children's responses were compared to those with low levels of measured anxiousness. The children's level of anxiety was rated on a five point Likert-type scale by the dentist during their routine dental check-ups. The interviews were transcribed and the self speech responses were divided into the groups representing positive, negative, and neutral speech. If no self speech was reported then this was divided in to the groups representing nothing and don't know. The results showed that most children reported negative self speech which focused on the painful experience such as "I keep thinking about the pain and drilling". Children who were more anxious about the dental visit were much more likely to report using negative self talk and much less likely to report using positive self talk. Not one of the

dentally anxious children reporting positive self talk examples. The author found the relationship between low levels of anxiousness and self talk was not as clear as there was no obvious specific type of self talk consistently used by this group. It was concluded that self talk can be both a tool for coping positively with the pain and a daunting dental experience but also can intensify and maintain fear and anxiety when negative self talk is used. Results showed that self regulation was not commonly used by the children in this study. Fifteen children reported using cognitive self regulation strategies such as 'I think about something funny' and twelve reported using behavioural self regulation tactics such as regulating their patterns of breathing or muscle tension. The authors concluded there was no relationship between dental fear and self regulation.

As discussed previously, coping strategies can be categorised into those that involve blunting and those that involve monitoring. A study by Miller et al. (1995) used this type of classification which looked at level of monitoring used by children when faced with threatening dental treatment. Eighty two children aged between 7 and 12 years were assessed for their cognitive disposition style, coping strategies and level of anxiety via self report and observations. The children's tendency towards monitoring in stressful situations was assessed using the CBSS (Miller et al., 1995). The CBSS children are asked to pick from a list of coping strategies the ones they would use to cope in four different stressful scenarios. Half of the options are blunting strategies and the other half are monitoring-based strategies. Coping strategies were identified from the children's self reports. Each child was asked to rate to what extent they used 15 different coping strategies. The questions were based around vigilance, avoidance, and active information seeking strategies. The child's use of sensory vigilance and question-asking strategies were also assessed by observation of a video recording of the child's behaviours during the dental procedure. The child's anxiety before and during the procedure was measured by self rating. An observer also gave ratings of the child's perceived anxiety and disruptiveness before and during treatment. The results supported the hypothesis that high monitors would be more likely to use sensory vigilance and avoidance coping strategies. Support was also found for the positive relationship between monitoring use and anxiety reports from both the child and the

observer. Children with high monitoring tendencies were more likely to experience high anxiety than low monitors. Results from this study also suggest that the use of avoidance appears to have an effect on the impact monitoring has on anxiety. Children who displayed a strong tendency to monitor and used avoidance experienced higher continuous levels of anxiety when faced with unpleasant dental procedures, whereas those children who engaged in high levels of monitoring but did use avoidance strategies tended to show high levels of anxiety prior to the dental procedure but these levels dropped considerably towards the end of the treatment. This finding suggests that avoidance strategies are not effective for children who are high monitors as their constant monitoring and thinking about the threat does not allow them to avoid it sufficiently for the avoidance to reduce anxiety.

Though the studies discussed above have provided information about the specific strategies the researchers chose to focus on, it can be argued that studies that look at a wider range of possible strategies offer more, well-rounded information about coping strategies in general. Versloot et al. (2004) looked at the wider range of coping strategies children may use in dental settings. This study investigated the coping strategies used by 597 Flemish 11 year olds when experiencing pain during dental appointments. The authors divided coping strategies up into three main types; External (e.g. I like it when the nurse holds my hand), Internal (e.g. I think about other things) and Destructive (e.g. I get angry at mum and dad at the dentist). They administered the children with the DCQ, which measured the children's level of fear, and asked them to state which strategies they used and how effective they thought they were. The children's dental status was also assessed. It was found that the children employed an extensive variety of strategies when coping with dental pain. The children used internal coping strategies most often and believed these to be effective at dealing with the pain. External strategies were used less often but were also rated as being effective and destructive strategies were found to be used very rarely and were thought to be moderately effective by those who did use them. The study also indicated that the more fearful children used more coping strategies and relied particularly on the external types. The authors suggest that such children lack the personal resources needed to effectively cope with the pain. The more fearful children

in the study appeared to have more tooth decay than the non-fearful, thus suggesting that such children tend to avoid going to the dentist therefore contributing to oral health problems.

The previous reviewed studies looking at coping strategies used by children suggest that children use a wide range of strategies to cope with dental anxiety and pain. These studies also indicate that internal strategies are more effective than behaviourally-based strategies.

Critique of Literature Regarding Children's Coping During Dental Visits

After considering the small body of research into children's coping during dental visits there appears to be a gap in the literature regarding the coping strategies used by younger children between the ages of six and ten years. Research has indicated that age and developmental level has an impact on the types of coping strategies children use. Therefore, further research involving younger children is important.

Most of the studies reviewed which investigate the coping strategies used by children in dealing with painful medical procedures and dental anxiety and pain have used self report questionnaires that only require the participant to tick or circle a response. This type of questionnaire can limit the value of the information supplied to the options available in the list. A lack of qualitative research in the area may mean that valuable information about the coping strategies used by children has not been accessed. By allowing children to use their own voices and words to describe their strategies and experiences a rich body of knowledge may be found.

Most of the studies investigating children's coping during dental treatment have been based on very small samples. This methodological issue limits these studies ability to produce valid results (Miller et al., 1992). Studies in this area have also varied widely in the specific strategies they have explored as well as their methods of categorisation of strategies. This has made comparing findings between studies virtually impossible (Skinner et al., 2003).

The present study will attempt to address some of the limitations found in the existing research.

The Present Study

Aims of the Present Study

The purpose of the study was to explore children's experiences of visiting the dentist. To achieve this, three areas were investigated. The first task of this research was to investigate children's view on what factors in the dental environment trigger anxiety. The second was to identify the coping strategies New Zealand children use to minimise anxiety during dental visits. This area was explored by asking children what they did to cope while at the dentist, and how effective they believed these strategies were on minimising their anxiety. The final area of the investigation was to find out what children perceived they needed during dental visits to enable them to cope better. Children's own ideas and views concerning dental anxiety and coping were the focus, allowing their voices to be heard.

This study will provide some insight into this area from a New Zealand perspective and contribute to the small body of knowledge that already exists concerning children's coping strategies while at the dentist.

Much of the existing research regarding the coping strategies children use in response to dental anxiety has been quantitative in nature and has used questionnaires and other quantitative assessment measures and tools which investigate the frequency of different coping strategies used (Miller et al., 1995; Vesloot et al., 2004; Van Meurs et al., 2005). Therefore, this research endeavours to provide more meaningful data that allows the participants to use their own words to describe their dental experiences and use of coping strategies and to give them the opportunity to discuss factors that may help them to cope better in the future.

The exploration of the types of coping strategies children already use when dealing with the stress and pain experienced during a dental visit will allow us to understand the processes involved and aid in the development of effective support programmes to help children who experience high levels of dental anxiety and lack effective coping skills with dental visits.

Method

Participants:

Convenience sampling was used to recruit the participants from a primary school in Palmerston North. The school was classified with a decile rating of 7 and has an ethnic composition of 76% European/Pakeha, 21% Maori, 2% Pacifica, and 1% Asian. The ethnic make-up roughly reflects the findings of the 2006 New Zealand Census (Statistics New Zealand, 2009). After permission from the Massey University Human Ethics Committee was granted, the school Principal was sent a letter inviting the school to take part in the study (Appendix A). Once the principal's permission was given, pupils in one Year 3-4 class and one Year 5-6 class were approached and invited to participate. Selection criteria included being seven years or over. This was due to developmental issues, where children younger than seven years may not yet have reached a cognitive level where they can verbalise and make sense of what they do to cope with fear and anxiety (Ablow et al., 1999). The children also had to be willing to talk about their experiences and coping strategies.

No non-consent forms were returned by parents stating that they did not wish their child to take part in the research so it was up to the child to decide if they wanted to participate on the day. All children who were present at school on the days data was being collected decided to participate. Fifty four children ranging from 7-11 years of age were included in the study. Twenty five participants were female and 29 were male.

Measures:

The Smiley Faces Program (SFP; Buchanan, 2005) is used to assess a child's level of dental anxiety. In this study it was used as a warm up for the children to get them thinking about visiting the dentist. This SFP is computer administered and was presented to the participants on the researcher's laptop computer. In the SFP the children are asked to show how they would feel in five different dental situations. The situations include thinking about going to the dentist tomorrow, waiting in the waiting

room, having a tooth drilled, having an injection, and having a tooth removed. The participants choose which of the 7 faces showing different facial expressions most represents their feelings in regard to the situation described on the screen (Appendix B). An advantage of the SFP is its use of computer graphics, which is inviting for children (Buchanan, 2005) and the researcher hoped to encourage their participation and engagement with the interview.

A semi-structured interview was used to collect information from the children regarding their dental experiences and use of coping strategies. An outline of the guiding questions for the interview is included in the appendices (Appendix C). Warm up and rapport-building questions were included at the beginning of each interview with the intention of making the children feel more at ease and open about talking about their experiences with the researcher.

The first set of questioning involved asking the child about their past dental experiences, with a particular focus on experiences where they had felt anxious or had experienced pain. This then led to asking them about the strategies they had employed to help them to cope during these unpleasant dental experiences, and what the dentist did or could have done to make the experience more manageable for them.

The second set of questioning required the children to imagine that either their younger sibling or best friend was visiting the dentist tomorrow and was very afraid and did not want to go. The children were then asked what tricks or strategies they could teach their sibling or best friend and what advice they would give them to help them cope better while they were there.

In the final set of questioning the participants were presented with a picture of another child receiving dental treatment (Appendix D and E). They were then asked what they thought was going on in the patient's head at the time and what strategies they thought the child should be using to help them to feel better. By using these three different approaches to questioning about coping strategies, if a child was not feeling comfortable talking about their own coping strategies it was thought that it might make it easier for them to talk about it from another's perspective.

As the interview schedule was semi-structured, the questions asked varied slightly between participants. At times questions did not need to be asked because they had been covered earlier in the discussion. The semi-structured format allowed for a less formal atmosphere in which it was assumed that children would feel more comfortable and would therefore find it easier to disclose their thoughts and feelings. It was important not to interrupt the flow of the conversations and to allow the child to lead the conversation rather than to ask only or all the questions on the schedule.

Before the interviews took place, the question outline was reviewed by a Senior Lecturer in Psychology, an early education educational researcher and tutor, and a teacher. Pilot interviews were conducted with two children aged nine and 12 years, this allowing for the further development and refining of the question guide.

Procedure:

Once permission was given from the Massey University Human Ethics Committee and the school Principal, a total of 60 information packs and consent forms were distributed to the children by their classroom teacher. These packs included a letter to the children and parents, a sheet with extra information for parents, a summary of the results request form, and a consent form (Appendix F). The letter encouraged the parents and children to read the information together and discuss whether they wished to participate. A time and place was arranged so that parents and/or caregivers could come and meet with the researcher to ask any questions they had regarding the study and their child's involvement. No parents or caregivers attended this meeting.

One week was given between sending out the information and the commencement of the data collection. Approval for the use of a passive consent process was given from both the ethics committee and the school's Principal. This meant that parents and caregivers only needed to return a signed form if they did not want their children participating in the research. It was asked that the forms be returned before the morning data collection was due to start.

All the testing took place in the teacher's resource room adjoined to the classroom, with only the researcher present. This location was decided as best as it was close to the children's classrooms so they could feel safe and secure but it was also quiet and free from distraction. Testing began each day shortly after the classroom roll was taken. One child at a time came in to be tested, after they had completed their turn they were asked to tell the next child on the list to come in.

Once the child was settled, a brief introduction and explanation of what was going to happen during the testing was given by the researcher. The children were told that they could stop the interview or SFP at anytime if they did not want to continue or they wished to ask a question. It was hoped that this would help the children to feel more at ease and in control of the testing situation. The child was then asked if they were willing to continue.

Once the child was happy to continue they were asked to sit at the computer and complete the SFP. The researcher read out the questions for each of the children and gave instructions about what they were to do. The children's responses were recorded by the researcher. However the results were not used for analysis in the present study.

After the SFP was completed the children were asked to sit with the researcher for the interview part of the study. The children were asked if their voices could be recorded during the interview and were able to test out the digital voice recorder and play it back so they could hear how it worked. Most of the questions asked were open and required the child to think and generate answers. A general guideline for questioning was used but the focus was on what the child wanted to say and the child was encourage to take the lead and direct where the interview went. Rephrasing was used regularly to ensure the researcher understood what the child was saying. Prompts were also made by the researcher when needed.

Once the questioning was complete the child was asked if they had any questions, thanked, and was able to choose a sticker before returning to class and calling the next child in for testing. Each testing session took between 10 and 15 minutes which was ideal for maintaining concentration and interest and meant that the interruption to the child's classroom work was limited.

Data Analysis

In the present study a thematic analysis method was used to analyse the data. Analysis began after the data was collected, which is in contrast to the grounded theory method (Boyatzis, 1998). A research driven technique described by Boyatzis (1998) was used during the coding stage. An article by Braun and Clarke (2006) which provided clear step by step instructions to the thematic analysis process was also used to guide the analysis.

Thematic analysis is a process which searches for patterns or themes present within a body of qualitative data. At its minimal level, thematic analysis describes and organises qualitative data. However it also has the ability to go further and can be used to interpret the phenomenon of interest (Boyatzis, 1998).

There are a number of advantages of using thematic analysis when analysing qualitative data. Thematic analysis does not require the user to possess a strong knowledge of the theoretical and technical aspects of approaches and is therefore especially suited to those new to qualitative research (Braun & Clarke, 2006). There is also flexibility in this approach that allows for it to be used within a number of different theoretical frameworks as it is not bound to any theoretical framework in particular.

Due to the theoretical flexibility of thematic analysis it is important for the researcher to make the theoretical position of the thematic analysis clear (Braun and Clarke, 2006). The present study will be using thematic analysis as a way to reflect the participants' reality, experiences and meanings of their dental visits and therefore will be taking an essentialist/realist theoretical stance. With this approach language is seen as a way of communicating meaning and experiences (Potter & Wetherell, 1987). As a result, the analysis of the present study will allow for the exploration of the participants' dental experiences, coping and needs as expressed by them during interviewing. At this point it is also important to acknowledge that the researcher plays an active role in analysis of the data. It is the researchers thinking about the data and making links within the data that produces the final themes (Taylor & Ussher, 2001).

A brief outline of the thematic analysis process of the present study will be described. In this study Braun and Clarke's (2006) six phases of analysis were followed. Only the first five phases will be described below as the sixth phase is concerned with the production of the final report.

The first step involved becoming familiar with the data. The researcher did so by conducting the interviews herself, thereby going into the analysis with some prior knowledge of the data. The data was recorded on a digital voice recorder which was played through in its entirety again while the researcher transcribed the data. Interviews were transcribed in verbatim form and included punctuation. Braun and Clarke (2006) highlight the importance of including punctuation in the transcription as the meaning of the data can be altered. Once the interviews had been transcribed in their entirety they were read through again to ensure familiarity. During this phase notes were made on the possible themes arising from the data.

The second step was concerned with the development of codes. The researcher compiled a list of the possible coping strategies used during dental visits which included strategies identified by previous research and theories concerning coping strategies in general. Once coding began it became apparent that there were a number of strategies present in the data that had not been accounted for in the original code so these were added during the coding process. Coding was completed manually by the researcher and involved highlighting the data in different colours to represent the presence of differing codes.

The search for the themes present within the data was the focus of the third step. During this phase the list of all the codes was broken up and then grouped together into potential overarching themes. The relationship between the different codes was considered by asking what was similar and different about each of the codes and how each code related to one another. Sub-themes were also introduced at this. To aid in this process a mind-map was used. A number of different variations of themes were developed before a map of candidate themes graduated on to the next stage.

In the fourth phase of analysis the candidate themes were reviewed and refined. Two levels of review took place. Firstly all the coded extracts under each of the themes was

looked at and the question, “do these all form a coherent pattern?” was asked. Some re-working took place in order to ensure that all data extracted fitted well under each of the themes. The second part of refining the themes involved considering the themes in relation to the complete set of data, asking the question “do these themes accurately reflect the data and its meanings?”. The transcriptions were re-read at this point to search for any codes or information that had been missed. Re-reading also helped to ensure that the themes were represented the data fully and accurately.

In phase five of analysis the themes are defined and given names. The essence of each theme was identified and a clear definition of each theme was outlined.

This process of analysis was performed separately for each of the three areas of interest in the study, anxiety triggers, coping strategies and needs.

Results of the analysis are presented in the next section.

Results

The present study explored children's experiences of visiting the dentist. Coping with anxiety during these dental visits emerged as the main focus. Three aspects of coping were investigated. Firstly, it was necessary to find out what it was that children had difficulty coping with while at the dentist and what triggered feelings of anxiety in them (Triggers). The questions asked to investigate this were: What is it that makes coping difficult? And what is it in the dental environment that triggers anxiety in children? The second aim was to identify what kinds of coping strategies children are using to help themselves cope better when feeling anxious at the dentist (Coping Strategies). The third area of interest was to find out what children thought the dentist could do to help them to cope better (Needs) by questioning what participants thought would make coping with dental treatment easier.

The data relating to the factors which trigger dental anxiety in the participants has been classified into five major themes (Sensations, The Unknown, Negative Beliefs, Loss of Control, and Mistrust). Participants' responses in regards to the coping strategies they use to combat their dental anxiety were also classified into five main themes (Seeking Reassurance, Control, Escape, Physical Interventions and Passivity). Finally the participants' responses to questioning about their needs was categorised into four different themes (Information, Increased Control, A Positive Atmosphere, and Distractions). Descriptions of these themes and sub-themes will be presented in the following sections with examples in the participants, own words from the transcribed interviews to support each theme.

Factors Triggering Anxiety in Children

One of the aims of the present study was to find out what factors in the dental experience children find provoke or diminish their anxiety during dental visits. This provided an understanding of the types of factors that children have to cope with in

the dental situation. The key questions of interest here were: What is it about going to the dentist that causes children to become anxious? And what is that they are having difficulty coping with?

Thematic analysis of the data found the presence of five overarching themes to represent the anxiety triggers that children described impacted on their ability to cope at the dentist. The themes are i) Sensations, (ii) The Unknown, (iii) Negative Beliefs, (iv) Loss of Control, and (v) Mistrust. These themes and their sub-themes will be presented below, with reference to examples from the interviews.

Theme 1: Sensations

In relation to questions regarding what children found upsetting at the dentist, most children described at least one sensation they experienced that triggered anxiety in them. These included pain, the thought of pain, and sounds.

Subtheme 1: A real pain

The most commonly described anxiety-provoking sensation was pain and many children went to the dentist with the anticipation of experiencing pain. The two following examples present children talking about how their previous painful dental experiences have led to their anxiety about future dental visits.

Interviewer - Ok so can you remember the last time you went to the dentist?

Participant 6a - Yes. I had an x-ray done and I had to get a tooth out...

Interviewer - Oh dear. Can you remember how you felt while you were there?

Participant 6a - Not happy basically

Interviewer – So not good. Nervous?

Participant 6a - Yeah. I was just relieved that I didn't have to have a filling done for the 5th or 6th time.

Interviewer - Okay so you've had fillings before?

Participant 6a- Just about every time.

Interviewer - And how do you feel when you have to have a filling?

Participant 6a - Very unhappy coz I hate the drill and the clamp- that really hurts.

Interviewer - Yeah it sometimes digs into your gum.

Participant 6a - Yes it does always with me.

Interviewer - Yeah it's not nice.

Interviewer - Can you remember the last time you went to the dental nurse?

Participant 27a - No...well it was a while ago.

Interviewer - Can you remember what happened while you were there?

Participant 27a - Um well the dentist just looked at my teeth and that's pretty much it.

Interviewer - Yip did she give them a clean?

Participant 27a - Yip

Interviewer - Did it taste nice?

Participant 27a - Yip. I only like the blower and the water.

Interviewer - Yip. Did you feel nervous at all?

Participant 27a - Yes. Yip I did coz I really don't like going to the dentist.

Interviewer - Why don't you like going to the dentist?

Participant 27a - Coz it hurts.

Interviewer - Can you remember a time when it's hurt?

Participant 27a - Yes when I had to get a filling. It really, really hurt. It actually really hurt when she was trying to put it in.

Interviewer- Oh that's not very nice. And how did you feel at the time? Can you remember?

Participant 27a - Um...I felt sort of sad and hurt at the same time.

Subtheme 2: Fear of Pain

The fear of experiencing pain was often expressed by participants who had never experienced pain at the dentist for themselves but knew that others had and that it was likely that they too would experience pain at the dentist.

Interviewer - So do you like going to the dental nurse?

Participant 1a - Not very much really.

Interviewer - Why don't you like it very much?

Participant 1a - Because I get worried I will have holes and need a filling. Fillings hurt don't they?

Interviewer - Have you ever had a filling before?

Participant 1a - No because...I haven't.

Subtheme 3 - Sounds

Sounds heard while at the dentist were also described as increasing their anxiety by a number of children. The noise of the dentist's drill featured almost exclusively in the data.

Interviewer - So you don't like having to visit the dentist?

Participant 6a - No I don't.

Interviewer - What is it that you don't like about it?

Participant 6a - It's the uncomfortableness of the drill. It doesn't hurt as such it's just that noise. You know it's not going to be good by that sound.

Interviewer - So what do you do when you are at the dentist that helps you to feel better about being there?

Participant 13a - Most of the time I can just close my eyes and try to relax and I'm okay. The only thing I have a problem with is the sound of the drill. I can't ignore that.

Interviewer - Oh yeah that's really hard to get away from isn't it. Hard to distract yourself from.

Participant 13a - Yeah it makes me feel funny inside when I hear it.

Interviewer - Funny in a nervous way?

Participant 13a - Yeah nervous and scared. Like butterflies in my tummy.

Theme 2: The Unknown

A theme of the Unknown featured in many of the interviews with children when they discussed why they felt anxious at the dentist.

Subtheme 1: Getting close to a stranger

Not knowing the dentist or dental nurse and being expected to talk and be touched by someone they did not know can cause many of the participants to feel anxious. In the example below a participant describes how she did not like having to talk with the dentist, who to her was a stranger.

Interviewer - Okay so you don't like going to the dentist very much. Why don't you like it?

Participant 2a - I don't really like going to the dentist coz you have to talk to her and it's kinda scary coz I don't know what to say. I didn't like her questions.

Interviewer - Would you rather she didn't say anything to you?

Participant 2a - Yeah.

Another participant stated the following with regard to what he doesn't like about visiting the dentist.

Participant 24a - She's like right up close in my face looking at my teeth and I don't like it. I don't even know her.

Interviewer - Yeah it's a bit strange having someone you don't know so close to you. How does that make you feel?

Participant 24a - A bit nervous I guess.

Again the theme of feeling uncomfortable being so close to a stranger causing anxiety is shown in the example from the interview with Participant 24a.

Subtheme 2: Strange feelings, noises, smells, tastes, and sights

Another aspect of the Unknown theme was the strange sensations experienced during the dental visit. Many children described odd feelings, noises, smells and sights that were not explained to them and this often left them feeling anxious and unsure.

Participant 19 talked about how scary she found the drilling sensation when she did not know what it was.

Interviewer - So what didn't you like about going to the dentist?

Participant 19b - When she drilled that buzzy thing in my teeth.

Interviewer - That made you feel nervous?

Participant 19b - Yip I didn't know what it was and it felt really yucky.

Interviewer - Yeah that's pretty scary when you don't know what's happening.

Would it have helped if the dentist told you what it was?

Participant 19b - Maybe, but it would still be yucky.

Below is an example taken from an interview with Participant 26. She experienced anxiety on hearing the dental nurse talking to her assistant about her teeth in technical terms that she did not understand. This left her feeling nervous and unsure about what it might mean for her and her teeth.

Interviewer - So did the dental nurse talk to you while you were there?

Participant 26b - No she talked lots to the other lady that was there though.

Interviewer - Oh yes. Did she have an assistant helping her?

Participant 26b - Yeah but it was confusing all these numbers and letters she said. And I didn't know which teeth she was talking about unless she was touching it. And I didn't know if she was saying they need fillings or not.

Interviewer - Oh no. So that made you worry a bit then?

Participant 26b - Yes. It made me scared.

Subtheme 3: Unknown protocol

Not knowing what to do and when to do things at the dentist such as when to sit up and when to respond to questions from the dentist and when it is not necessary was another aspect of the unknown that featured in the data. The following participant describes her first experience at the dentist and why she found it frightening.

Interviewer - Can you remember a time when you went to the dental nurse and felt nervous?

Participant 23b - Yes.

Interviewer - Can you tell me about it?

Participant 23b - I remember the first time I went I was scared. I didn't know what to do. The dental nurse was asking me things but I couldn't answer because too much stuff was in my mouth and I didn't know what to do.

Interviewer- Yeah that sounds like it was a bit scary for you.

Theme 3: Negative Beliefs about Dentistry

Subtheme 1: Irrational beliefs/Catastrophising

Many children had irrational beliefs about what was happening to them when they were at the dentist. Things like choking or dying were mentioned. Understandably this left them feeling highly anxious about visiting the dentist.

Interviewer - Do you like going to the dentist?

Participant 25b - If I have to have something done to my teeth I sort of don't like it.

Interviewer - Yeah that's understandable. Have you ever had to have something done to your teeth before?

Participant 25b - I had to have a filling when I was little but when I went a little while ago my teeth were just a little bit grey inside there, my 2 little teeth, so I had to have a some little baby fillings.

Interviewer - Okay so little baby fillings for little baby teeth. Did it hurt you when you had them done?

Participant 25b - Um well when she was putting water into the first one I sort of nearly choked a bit.

Interviewer - Oh no and that was a bit scary I bet.

Participant 25b - Yip because I said "I'm about to choke" and she said "No. We wouldn't let you choke".

Interviewer- That's good. Did that make you feel better when she said that?

Participant 25b - Hmm a little bit but it was still a bit yuck.

Interviewer - Oh no that sounds a bit scary.

Participant 25b - It was filling my mouth up with water.

Interviewer - And you didn't like that feeling.

Participant 25b - No. It felt like I might choke and not be able to breathe.

Interviewer - Oh that's not nice. She needed a sucker thing to suck all the water out for you. Does she have one?

Participant 25b - No

Subtheme 3: Scary Stories

Many children suggested that they were scared of visiting the dentist because of scary stories they had been told by family and sometimes friends. One participant said the following:

Interviewer- So do you have brothers or sisters?

Participant 6b - Yip, older brother and sister.

Interviewer - Are they pretty happy about going to the dentist?

Participant 6b - One's at Ross. She calls her dental clinic the murder house.

Interviewer - The murder house?! Where do you think she go that from?

Participant 6b - Her friends at school tell each other scary stuff about what the dental nurse does and she tells me.

Interviewer - How does that make you feel about going to the dentist?

Participant 6b - A little bit scared.

Theme 4: Loss of Control

A lack of control featured in the discussions about what makes children feel anxious about going to the dentist. Not being able to talk, to sit up, not being able to breathe, having a light shining in your eyes and having someone standing over you were all examples children gave of things they found frightening at the dentist. Running through each of these examples are the feelings of loss of control and of being trapped.

One participant talked about how the light shining in his eyes left him feeling trapped.

Participant 7a - The worst part is probably the light shining in your eyes, you feel trapped.

Interviewer - Yeah that's not nice. Do you ever get sunglasses to wear?

Participant 7a - Sometimes but they are always too big and that doesn't help me see any better anyway.

Interviewer - Yeah.

Participant 7a - I don't like not being able to see what's happening.

Another participant talked about how not being able to breathe or swallow while receiving dental treatment left her frightened.

Interviewer - And how did you feel when you were sitting in the chair?

Participant 8b - Not very good because I couldn't swallow when I needed to and I couldn't actually breathe out of my mouth so my nose actually hurts.

Interviewer - Yeah I hate not being able to breathe out of my mouth.

Participant 8b - And the water tastes really yucky.

Interviewer - Yeah. And how did you feel when you couldn't breathe properly?

Participant 8b - A bit scared.

Participant 20 describes having trouble coping while at the dentist because of the lack of control he feels.

Interviewer - So is there anything that you do to make yourself feel better when you are at the dentist and it's hurting?

Participant 20a - You just can't really do anything at the dentist. You have to lie down and let the dentist do what she wants. I don't like that, especially when it hurts coz you just want it to stop but you can't do anything.

Theme 5: Mistrust

The theme of mistrust and lack of confidence in the dentist was also present in a number of the discussions with the participants. This led to the participants feeling anxious about attending the dentist again. One participant outlined his fears in the dentist's ability below.

Interviewer - So can you remember the last time you went to the dentist or dental nurse?

Participant 1a - Hmm I remember last time I went was when I got my tooth put back in.

Interviewer - Oh put back in. Did your tooth get knocked out?

Participant 1a - Yeah

Interviewer - Was that pretty scary?

Participant 1a - Mmmm

Interviewer - How did you feel? Did you feel okay about going to the dentist to get it fixed or...?

Participant 1a - Nah nah nah. They didn't know what they were doing.

Interviewer - Oh no so you felt like the dentist didn't know what they were doing?

Participant 1a - Nah

Interviewer - Oh gosh so that made you feel a bit scared then?

Participant 1a - My tooth is crooked and if it stays like that any longer it will just go and fall out.

Interviewer - So what's happened now? Does it still need fixing?

Participant 1a - Hmm

Interviewer - Okay. Um so did you feel happy about going to get it fixed?

Participant 1a - Certainly not...

Interviewer - Certainly not... or so were feeling pretty unhappy?..

Participant 1a - Way down the last one (Referring to the saddest face on the Smiley Faces Program).

Interviewer - Way down to the very unhappy face? That's not so good.

In summary, the factors that triggered participants' dental anxiety were identified and categorised into five themes. *Sensations*, including pain, a fear of pain, and sounds, were important factors that participants highlighted as increasing their level of anxiety. Being forced into the *Unknown* was another common theme producing anxiety in participants. *The Unknown* included factors such as getting close to a stranger, strange noises, feelings, tastes, sights, and smells, and not knowing the rules around attending the dentist. *Loss of Control* was another theme that was commonly repeated in the

data. Participants often reported feeling trapped and felt helpless when receiving dental treatment. *Mistrust* of the dentist and their ability to help also featured as an anxiety-inducing factor in the data.

Coping Strategies

The second aim of the present study was to identify what types of coping strategies children are using when they attend the dentist. One of the major questions guiding the research was: What are the coping strategies children use when attending the dentist?

The results of the analysis indicated the presence of five overarching themes within the data that relate to the coping strategies used by children at the dentist. These are: (i) Seeking reassurance, (ii) Control, (iii) Escape, (iv) Physical Interventions and (v) Passivity.

Each of the five themes and their related subthemes will be presented in the sections below. Examples of each of the themes and subthemes will be provided in the form of samples taken directly from the interview data.

Theme 1: Seeking Reassurance

The first major coping theme found to be present in the interview data was seeking for reassurance. This theme was further broken down into the three sub-themes of comfort from a person or object, self reassurance, and seeking reassurance from the dentist.

Sub-theme 1: Seeking Comfort from a Person or Object

Evidence highlighting most children's need for reassurance while at the dentist was apparent throughout the interview data in this study. Almost all the children

interviewed stated that they would prefer having a parent present in the room while they were being seen by the dentist but it was the younger children who were more likely to describe receiving physical contact from a parent or nurse to help them to cope. Most suggested holding someone's hand was a good way to cope when they were feeling nervous or were experiencing pain.

Interviewer - So you've been to the dentist and felt pretty scared and nervous before

Participant 25b - Yip

Interviewer - So was there anything that you did that made you feel a little bit better about being there?

Participant 25b - Well my mum came with me and pulled up a chair so she was close to me and held my hand. That helped me feel a bit better.

Interviewer - That's nice. So that made you feel happier about being at the dentist?

Participant 25b - Yeah

Many children described how receiving comfort from an object such as a teddy bear also helped them to cope better when at the dentist though, again, this was more likely to be the younger children in the sample suggesting this.

Interviewer - So while you were sitting in the dentist's chair and feeling nervous was there anything that you did that made yourself feel better?

Participant 28a - I was just holding really really tight to the hand thing...the handle bars.

Interviewer - Yip. Do you think that helped you to feel better about being at the dentist?

Participant 28a - Yeah

Interviewer - Was your mum or dad with you?

Participant 28a - My mum was and so was my sister coz she had to go too.

Interviewer - And did they help you?

Participant 28a - The last time they helped me at the dentist was when I was probably last year.

Interviewer - And when they helped you what did they do?

Participant 28a - She used to bring my favourite toy and I had 2 injections and they were like holding it up and going dadada. It made me feel really comfortable.

Subtheme 2: Self Reassurance

The analysis uncovered another aspect of the reassurance theme which was using self reassurance to enhance coping during dental visits. Using positive self talk or saying encouraging things inside their heads to aid with coping while at the dentist was regularly described by children throughout the interviews. The themes of reassurance and encouragement were very often a part of these statements.

Interviewer - So just pretend you are at the dentist and feeling really nervous. Is there anything that you do that helps you to feel better?

Participant 23b - Um I hug my mum.

Interviewer - You hug your mum. That's such a good thing to do to make yourself feel better.

Participant 23b - But if she's not there I just keep telling myself not to worry, you're going to be fine.

Subtheme 3: Seeking Reassurance from the Dentist.

Another part of the reassurance theme was the reliance of some children on the reassurance from the dentist. Children described feeling better when the dentist used reassuring comments and chatted to them either about what was happening to their teeth or more general everyday things.

Interviewer - So is there anything that you do while you are with her that makes you feel better?

Participant 16a - Well I like talking with the dentist.

Interviewer - Yeah what do you talk to her about?

Participant16a - Um...well school and my new puppy.

Interviewer - Oh yes so you like to chat about other things like school and home. Do you ever like talking about your teeth or what the dental nurse is doing to your teeth?

Participant 16a - I sometimes feel better when the dental nurse tells me that my teeth are all healthy and I don't need any fillings or anything scary done.

Interviewer - Yeah? So you like to talk about your teeth when she reassures you that everything is going to be okay?

Participant 16a - Yeah. She's kind so that feels nice. And it's good when I don't need anything done.

Other children described feeling reassured and safer when they could ask the dentist questions about the treatment they were receiving. When the children were provided with reassurance they felt safer and that they could place their trust in the dentist to look after them and their teeth.

Interviewer - Is there anything that the dentist does that makes you feel better, more comfortable being there?

Participant 11b - Well she asks me if I have any worries or questions before we start.

Interviewer - And that makes you feel better?

Participant 11b - Yeah it makes me feel a bit better.

Interviewer - That's good. Do you ask her questions?

Participant 11b - Sometimes- but not really.

Interviewer - What do you ask about?

Participant 11b - Once. Once I asked her if it was going to hurt.

Interviewer - What did she say?

Participant 11b -She said it might pinch and be a bit uncomfortable but not hurt really.

Interviewer - Did that reassure you and make you feel better about what was going to happen?

Participant 11b - Yip.

Theme 2: Control

The search for control was another theme that emerged from the children's responses regarding the types of coping strategies they used while at the dentist. The theme of control was then divided into two sub-themes. These are cognitive control and feeling like I'm in control/internal locus of control.

Subtheme 1: Cognitive Control

Many children described using their minds to control what they were thinking and feeling while at the dentist. Children described forcing themselves to think logically

and to get real about what was really going to happen while they were at the dentist. They controlled their mind to 'get real' by telling themselves things such as Participant 17.

Interviewer - Is there anything that you say to yourself – maybe inside your head – when you are at the dentist that makes you feel better about being there?

Participant 17a - Um yeah I think it's fun, they're not going to do any harm, it's not like they will put you to sleep and chuck you in lava.

Interviewer - That's right, I don't think that would happen. So you kind of tell yourself that nothing that bad is going to happen so you'll be okay?

Participant 17a - Yeah

Others suggested that the best way to cope was to stay in control of yourself and what you are feeling. Comments such as this one made by Participant 13 *"Stay calm and controlled and it will be okay"* and Participant 1 *"Just don't get frustrated or it will be worse"* were common.

Other children controlled their cognitions by reframing the situation in a positive light.

Interviewer - Is there anything that you try to think about when you are at the dentist?

Participant 3a - I just try to think like it just tickles and it tastes quite nice and it's good for my teeth.

Interviewer - Yeah, it does taste nice sometimes. So you just try to think about the good things that happen at the dentist?

Participant 3a - Yes like the tastes you get and that you get to get out of class for a bit too.

Subtheme 2: Feeling Like I'm in Control/ Internal Locus of Control

Children often talked of coping better at the dentist when they felt they had some sense of control over what was happening.

Interviewer - Was there anything that the dental nurse did that made you feel better?

Participant 28a - I could ask her for a break if I needed it, so I could have a chance to calm down.

Interviewer - That's good so you would have felt okay about asking her to do that?

Participant 28a - Yes.

Interviewer - And do you think she would let you?

Participant 28a - Yeah I think so.

Participant 6 felt that a good way to cope was to ask for help from the dentist. He was happy to take control and ask for something that would help him to cope better.

Interviewer - Ok so in this photo here there's a boy who's about to get his teeth drilled. You can see he's got a couple of dentists around him trying to fix his teeth. Is there anything that you think he should do that would make him feel better?

Participant 6a - He could ask for an injection or to be put to sleep if he was finding it too hard.

Interviewer - That's a good suggestion. Do you think you would do that if you were finding it hard at the dentist?

Participant 6a - Probably.

Interviewer - Yeah? And you think that would help you?

Participant 6a - Yeah except that last time I went for a check up I really didn't want an injection. I hate the ones in my arm enough!

Interviewer - Yeah an injection sounds a bit scary doesn't it.

Participant 6a - It's the uncomfortableness of the drill. It doesn't hurt as such.

Other children displayed a strong internal locus of control and felt like they were able to cope well at the dentist because they had looked after their teeth and therefore would have nothing to worry about.

Interviewer - Ok so can you remember the last time you went to the dentist?

Participant 8a - Yes

Interviewer - Was it recently?

Participant 8a - Ah yes it was about three weeks ago.

Interviewer - Ok so that's still pretty fresh in your memory then. Can you remember what happened there?

Participant 8a - Yeah I just needed to get a check up coz earlier this year I had to get a few teeth out so they just wanted to see if it was going to be one or two teeth. They were baby teeth that fell out on their own.

Interviewer - Ok cool. So if you think back to the time when you had your teeth out. How did you feel?

Participant 8a - Um... I felt pretty confident that there wasn't much wrong because I make sure that I brush my teeth every day. And it makes you feel more confident if you've brushed your teeth every day.

Interviewer - Very good, I like to hear that. So you didn't feel scared or nervous?

Participant 8a - No

Interviewer- Pretty relaxed?

Participant 8a - Yip

Interviewer - That's really good. Do you think there is anything that you do or you think that about that makes you feel that way? Relaxed and cool?

Participant 8a - Well it's just that I feel relaxed because I look after my teeth and if there was anything wrong it probably wouldn't be a big deal.

Theme 3: Escape

Using escape as a form of coping while at the dentist was another theme that arose from the interview data. This theme was broken down into cognitive subthemes of 'My happy place' and 'Thinking about something else', the behavioural escape subthemes of avoidance and aggression, and the external escape strategies of distraction and rewards.

Subtheme1: Cognitive Escape - 'My Happy Place'

Many children described coping at the dentist by escaping from the often unpleasant present situation with their thoughts. Many described escaping the situation by "going to my happy place" or "thinking about something else" which usually involved them in thinking about doing something they enjoy. Most of the older children reported using these strategies as well as a number of the younger children. Some children could describe their happy places in detail and it appeared that they used this coping strategy in many different stressful situations. Examples of these escape strategies can be seen in the following excerpts.

Interviewer - Okay so I'll show you this picture here. It's of a little girl getting dental treatment and she's not very happy about it. What do you think she should do right now to make herself feel better?

Participant 27a - Um well...try not to think about it

Interviewer - Yip...?

Participant 27a - And try to think of a happy place.

Interviewer - Wow that sounds cool. Can you tell me what a happy place is?

Participant 27a - Well...it's a place you think about that makes you feel happy and safe inside.

Interviewer - Oh okay. So you imagine that you are there instead of at the dentist?

Participant 27a - Yeah.

Interviewer - What a good strategy! Does it help you feel better?

Participant 27a -Yeah, usually.

Interviewer - Gosh so you were feeling nervous. And so did you do anything to make yourself feel less nervous while you were there?

Participant 12a - Um... well I just kind of went with it coz I usually don't go there much so and I knew it would be pretty short.

Interviewer - So you focused on that. Did you say anything inside your head?

Participant 12a - I thought like "it'll only take 5 minutes and it will be over".

Interviewer - Yeah and did you try to think about anything else?

Participant 12a - Um yeah I tried to think about playing play station coz that's what I like.

Interviewer - Oh okay so you thought about something you liked. And do you think that worked?

Participant 12 - Well yeah pretty much if you just think about something you like it takes your mind off things. So I just thought about a game I was playing the day before and stuff.

Interviewer- So while you're at the dentist is there anything that you do to make yourself feel more comfortable?

Participant 16a - Um...usually I have a look around the room and observe all the things on the wall. Then once I've done that heaps I think about lots of different breeds of dogs.

Interviewer - Ah ha, that's a good distraction technique so you obviously like dogs and thinking about them makes you feel good.

Participant 16a - Yeah I really like dogs so thinking about them makes me feel good and it distracts me from feeling nervous.

Subtheme2: Behavioural Escape

Behavioural escape was another coping strategy suggested by the children. This included physically avoiding the situation by running away or hiding.

Interviewer- What about if you had a best friend who had to go and was really unhappy about going. Would you suggest they did anything or give them some advice?

Participant 6a - Yeah I'd give them some advice on a hiding place. There are lots of good hiding places at this school.

Interviewer - Is there? But what if they had to go and couldn't hide? What would you say they should do?

Participant 6a - Um just go to sleep. Stay up really late the night before and then yeah...

Interviewer - So then they can fall asleep in the dentist chair.

Participant 6a - Yeah

Interviewer - That's very creative suggestion! Do you really think it'd work?

Participant 6a - I reckon it's worth it maybe if you don't want to go.

Participant 6a also suggested that getting himself hurt might get him out of going to the dentist and even suggested that this would be a more pleasant alternative to having to go to the dentist. Another talked about pretending to be sick so they could avoid going.

Interviewer - So what do you think you could do to make it better for yourself?

Participant 6a - Except knock myself out. No.

Interviewer - No?

Participant 6a - But it would have to be without a bleeding nose.

Interviewer - Oh what do you mean by that?

Participant 6a - I was thinking when I was laying in bed one night that I could just get someone to punch me and then I'd get knocked out and wouldn't have to go or if I did I wouldn't know what was happening.

Interviewer - But then you'd have a sore nose or head to deal with.

Participant 6a - But I'd rather have a sore nose than teeth and have to go to the dentist.

Interviewer - Can you remember the last time you went to the dental nurse?

Participant 9a - Well I remember the last time I was supposed to go to the dentist.

Interviewer - Oh yes, but you didn't go?

Participant 9a - No. Mum told the dental nurse I was sick coz I wouldn't go.

Interviewer - Gosh, you must have really not wanted to go.

Participant 9a - No. I hate it there.

Interviewer - Oh dear. So you can you tell me about another time that you did go to the dentist?

Crying, getting upset and getting angry were other ways children suggested were ways of avoiding dental treatment. Examples of children avoiding dental treatment by getting upset and crying are shown below in segments from two interviews.

Interviewer - Can you remember a time when you went to the dentist and felt really scared or nervous?

Participant 13a - Yeah once when I was a bit younger I had to go and didn't like it. I cried and cried and they ended up letting me go home.

Interviewer - Really?

Participant 13a - Yip

Interviewer- So you didn't end up getting the treatment you went for?

Participant 13a - Nope.

Participant1b - One time the dental nurse was going to pull out one of my teeth but I got really scared and cried and screamed.

Interviewer - And did she pull it out?

Participant 1b - No. It fell out on its own later.

Interviewer - Oh so it was a baby tooth then?

Participant 1b - Yeah.

One child responded aggressively to questions about what he might be thinking during treatment.

Interviewer - Just pretend that you are sitting in the dentist chair like the girl in this photo. What would you be thinking right at that moment?

Participant 1a - Get off my face!

Interviewer - Would you?

Participant 1a - Yeah

Interviewer - And would you say anything out loud to the dentist?

Participant 1a - I'd probably just go "don't get that drill near me".

The children who did suggest these types of coping strategies usually admitted that they rarely worked and suggested other strategies they used to cope once there that were more effective.

Subtheme 3: External Escape Strategies - Distraction and Rewards

Most children identified relying on external distractions as a way of coping with dental anxiety and pain. Many of them agreed that using external distractions was an effective way of escaping from their anxiety for a short time. Some believed that these distractions also helped them deal with pain while at the dentist. Descriptions of using distraction activities supplied by the dental nurse such as the puzzles and games placed on the ceiling above the dental chair were common, while others said they listened to the radio if it was on in the clinic.

Interviewer – So is there anything that you do when you are at the dentist that makes you feel better?

Participant 6a – Um...

Interviewer – You told me before that you sometimes try to think about things that make you happy. Is there anything else that you might do to take your mind off what is happening?

Participant 6a - Well sometimes I do the maze that's on the roof.

Interviewer - Oh yes. Did the dental nurse put one up above the dentist's chair?

Participant 6 - Yeah

Interviewer - Cool. Okay so sometimes you do that. And does it make you feel better?

Participant 6a - Yeah. I've tried to do the maze up there like 6 times and I still haven't been able to finish it.

Interviewer - Wow so it keeps your mind occupied for a while then?

Participant 6a - Yeah, it's fun.

Interviewer - Does it make you feel less nervous?

Participant 6a - Yeah I think so. It stops me thinking about what the dental nurse is doing.

Participant 12b - Oh yeah. The dental nurse I go to. She has a radio and she has it on all the time.

Interviewer - And do you think that helped?

Participant 12b - Kinda

Interviewer - Yeah? And you think it might have helped you feel less nervous when you focused on the music?

Participant 12b - Yes, I liked it. And it made me feel good.

Interviewer - That's good. Maybe more dental nurses should do that.

Participant 12b - Yeah.

Theme 4: Physical Interventions

Relying on physical interventions as a form of coping when visiting the dentist was the fourth theme identified in the data. This theme is made up of the subthemes tension, relaxation, and release.

Subtheme 1: Tension

Most children reported using their bodies in some way to help them cope with the stress involved in visiting the dentist, some suggested using these techniques without being asked and others reported this after being asked by the interviewer directly. Tensing their body or parts of their bodies was one way many described coping.

Interviewer - Did you do anything with your body when you felt nervous?

Participant 14a - I just lay there frozen with my muscles all tight.

Interviewer - So you tensed all your muscles?

Participant 14a - Yip

Interviewer - Did that make you feel better.

Participant 14a - I think so...yes.

Some talked about holding or squeezing something in their hands and suggested that this often helped them to feel better.

Interviewer - Did you have your mum or your dad with you?

Participant 5b - My mum and my sister, she had less time.

Interviewer - She didn't need a filling?

Participant 5b - Um no she just needed to get her teeth checked.

Interviewer - Yeah? And so did it help you to have them there?

Participant 5b - Pretty much.

Interviewer - Yeah did they hold your hand?

Participant 5b - My mum did a few times.

Interviewer - She did? That's good.

Participant 5b - And I got to hold a ball too.

Interviewer - You got to hold a ball?

Participant 5b - Yeah

Interviewer - Did that make you feel better too?

Participant 5b - Yeah. Squeezing it real tight was good.

Interviewer - So while you were sitting in the dentist's chair and feeling nervous was there anything that you did that made yourself feel better?

Participant 28a - I was just holding really really tight to the hand thing the handle bars.

Interviewer - Yip. Do you think that helped you to feel better about being at the dentist?

Participant 28a - Yeah

Subtheme 2: Relaxation

Relaxation was another form of physical intervention described by some children as a way of coping with nerves or pain while at the dentist. Some children talked about relaxing their muscles.

Interviewer - So what do you think it was that you did that made you feel okay about being at the dentist?

Participant 17b - I just try to relax. And like go sort of all floppy.

Interviewer - So just relaxed all the muscles in your body? Did that make you feel better about being at the dentist?

Participant 17b - Yip.

Another common way children spoke about relaxing was by closing their eyes. More than half the children interviewed reported doing this at the dentist.

Interviewer - Ok so in this picture here there's a little girl getting dental treatment and she's not very happy about it. What do you think she should do at this time to make herself feel better?

Participant 26a - Just close your eyes, relax and try and go to sleep.

Interviewer - Yeah that's a good thing to do. Have you tried doing that yourself when you have been to the dentist?

Participant 26a - Yip.

Interviewer - Did it help you?

Participant 26a - Yes.

Subtheme 3: Release

The final sub-theme identified under physical intervention was the release of tension. Some children described moving as a way of coping with the feelings of anxiety that would build usually when they were thinking about going to the dentist.

Interviewer - And can you remember how you felt at the time when you were sitting in the chair?

Participant 5a - Pretty nervous.

Interviewer - Yeah lots of people feel nervous when they go to the dentist. Even adults do.

Participant 5a - Adults?!

Interviewer - Yip

Participant 5a - Adults should be A-Ok

Interviewer - Yeah but some of them aren't. It can be a scary thing for lots of people to go to the dentist. So was there anything that you did to make yourself feel better or less nervous?

Participant 5a - Sometimes when I feel nervous before I go I have a few run arounds and jumping on the tramp and having some water.

Interviewer - Wow that's a good way to get rid of nerves. So you did that when you felt nervous before you went to see the dentist?

Participant 5a - Yeah before... and after.

Theme 5: Passivity

Passivity was the final theme identified in the data. It includes strategies that indicate the acceptance of having little or no control or power over the situation and involves

relying on hoping, wishing and praying that everything will be okay or relying and placing all trust in the dentist.

Subtheme 1: Wishing, hoping, praying

A number of children talked about hoping, wishing, or praying really hard that there will be nothing wrong with their teeth while they were sitting in the chair. Such themes arose when children were asked what they were thinking or saying inside their head while they were sitting in the dentist's chair. Wishing, hoping, praying became a subtheme to passivity.

Interviewer - Was there anything that you did that made you feel less nervous?

Participant 20a - Nothing

Interviewer - Did you think about anything in your head?

Participant 20a - I was thinking please don't let there be anything wrong. Please please.

Interviewer - So how did you feel when you were there? Did you feel nervous?

Participant 16b - I didn't feel too bad but I was just really hoping that I wouldn't need anything.

Interviewer - That you wouldn't need a filling or anything?

Participant 16b - Yeah. Just was really hoping hard.

Interviewer - Yeah, I think lots of people hope that!

Subtheme 2: Placing all trust in the dentist

Another related subtheme under the passivity theme was the placing of all trust and reliance in the dentist and accepting there is little they themselves can do. This subtheme indicates the belief that as a patient, the child believes that they themselves have little or no control over the situation and has to trust the dentist in order to cope with the experience. This is almost in complete contrast to the theme of control outlined earlier.

Interviewer - When you are at the dentist is there anything that you do that makes you feel better about being there?

Participant 30a - No...

Interviewer - Nothing that you do or think about?

Participant 30a - Um... well there isn't really anything I can do. The dental nurse just has to do whatever she has to do.

Interviewer - Yeah. Some people try to distract themselves and maybe try to think about something else to help them feel less nervous. Do you ever do that?

Participant 30a - No, I don't think so.

In summary, the exploration of coping strategies identified a number of personal and external resources that the participants used to help cope with pain and anxiety while attending a dental appointment. These strategies were presented in five themes. *Reassurance* from others and objects were commonly used by participants to aid in their coping. Gaining some feeling of being in *control* during dental treatment appeared to be an important part of coping for many participants. They achieved this through the use of cognitive control and possessing a strong internal locus of control. *Escape* from the dental situation was another way participants described coping. This took the form of physically trying to escape from the situation as well as mentally escaping to one's happy place. Distractions and rewards also provided temporary relief

from anxiety felt while attending the dentist. *Physical interventions* like tension, relaxation, and release also provided participants with a way of managing their feelings in the dental situation. Finally, some participants used *passivity* to help manage their dental anxiety. These participants believe that there is little they can do to improve the situation themselves and therefore rely on hoping, praying, and wishing that everything will be alright, or placing all their trust in the dentist.

Needs

As well as identifying the factors that influence anxiety and the coping strategies children use while at the dentist, this project also wanted to investigate what children thought would help them to cope better while at the dentist. The participants discussed how more information, increased control, a positive atmosphere, and distractions would aid them in coping with dental anxiety. The following sections outline these areas of needs in more detail.

Theme 1: Information – Getting the facts straight

From the discussions about what would help the participants to feel less anxious and cope better while at the dentist, information stood out as a main theme. There was some debate over whether it was best to be informed by the dental nurse as to what she was doing or not. This depended on each child's personal preferences. Some felt better knowing exactly what was happening and when, while others liked to know very little of what was happening and wanted to focus on distracting themselves. However, what became apparent in the data was that all children needed more information about what happens at the dentist before they go in order for them to cope better.

The data supported the idea that there is a need for children to be educated about what actually happens at the dentist and why it is important that they receive regular treatment. Most children interviewed regarded dentistry negatively regardless of their own dental experiences and appeared to have acquired negative information from

family, friends and the community. The data highlighted this lack of accurate information as shown in the examples from the interviews below.

Some children had no idea why it might cause them to experience less pain if they have an injection rather than if they did not. If they were asked if they would like an injection, upon hearing the word injection, they flatly refused leaving them to make a decision without being fully informed about the situation.

Participant 6a - No no no. I would not want an injection. I would say no.

Interviewer - So even if an injection helped to numb your tooth so that it didn't hurt when the dentist drilled you would say no?

Participant 6a - I would not have an injection if I had the choice. I hate the ones in my arm enough let alone one in my mouth!

Many of the children interviewed wished they had been told they could take something from home such as a toy that helps them feel calm. Information about what is acceptable to bring or do while at the dentist had not been made clear to children and their families. If this had been clarified it would have enabled them to access tools that may have helped them to cope better with dental visits. This information is missed by many families such as highlighted in the segment below.

Participant 18b - Maybe if I was allowed to take something I'd take Puffin with me.

Interviewer - Who is Puffin?

Participant 18b - Um... my favourite toy.

Interviewer - Oh yeah. That's a good idea. Do you think that would help you to feel better about being at the dentist?

Participant 18b - Yip.

Interviewer - But you've never brought Puffin along to the dentist before?

Participant - No. I didn't think of it. Didn't know I was allowed. And we went straight from school so I would have had to go home and didn't have time.

The possibility of even bringing their own MP3 player was discussed by some participants so they could listen to music while they are there. Many children had never thought of this as an option and, when it was suggested, they thought it would help them to cope better while at the dentist. If children were provided with this information it could create a more positive dental experience dental for many children.

Participant 9a - I have a MP3 maybe I could take that and then I could try to focus on that instead of the pain. I never thought of that.

Another need related to the information theme present in the data concerned the dental nurse providing more information during treatment. Many did not want to know details of the treatment they were receiving but basic information such as the length of time the appointment was going to take was important. One participant discussed how it would have been easier for her if the dental nurse had informed her of how much longer her treatment was going to take. Providing reassurance that the appointment will eventually be over is needed by many participants.

Participant 25a - I kept thinking How much longer is this going to take? Because she'd taken something out of my mouth and then she was sitting there waiting for something and I thought "Oh it must be nearly finished now" but then she started to do it on another tooth.

Interviewer - Oh no. And you were like "When is this going to be over?"

Participant 25a - Yip.

Interviewer - What would you have liked the dental nurse to do?

Participant 25a - She could have let me know how much longer it would be.

Interviewer - That would have helped you feel a bit better?

Participant 25a - Yip.

Theme 2: Increased Control

A need to feel more in control of what is happening during dental treatment was evident in much of the data. Many children suggested that they feel better at the dentist when they are asked during treatment if they are okay and are given the opportunity to say no if they are not. One child suggested that even before treatment begins the dentist should tell them to say something or signal if they need a break or they are in too much pain. The need for the dentist to allow children to feel more in control and involved in their own dental treatment is essential to aid in children's coping.

Interviewer - Did the dental nurse do anything that made you feel happier about being there?

Participant 11b - Once when I was getting a filling she told me that if I wasn't feeling good in the middle of it and needed her to stop for a bit I should do this with my hand.

Interviewer - Oh wow. That was a good plan. Did that make you feel better?

Participant11b - Yes.

Interviewer - Did you have to make the hand signal?

Participant 11b - No I didn't need to.

Interviewer - That's really good then. .Would it help if all dentists did that?

Participant 11b - Yes it would be good.

Theme 3: Positive Atmosphere

Much of the data concerning the participants' needs related to the need for a positive and comforting atmosphere. This included the need for comfort and reassurance from the dentist. Many children talked about wanting the dentist to chat with them about

everyday things to help put them at ease and to welcome them to the clinic in as friendly a way as possible. Being rewarded by the dentist after treatment was another way of making a dental visit a positive experience for many children.

Subtheme 1: Comfort/Reassurance

Many children suggested that they needed comfort and reassurance from the dentist. Participants suggested that they needed to be chatted to about non-dental related things and in general being made to feel more comfortable in the situation.

Interviewer - What would you like the dentist do to make you feel better while you are there?

Participant 22a - Well the dental nurse could chat with me.

Interviewer - Okay. And what would you like her to chat about?

Participant 22a - Chat about other things – like how I’m going in school and that.

Interviewer - Oh okay cool?

Participant 22a - Yeah that would make me feel comfortable.

Reassurance about what was happening with their teeth was also an important need for some participants.

Interviewer - So what could the dentist do next time that would make you feel better?

Participant 9b - Well one thing that I would like to know is if everything is okay in my teeth. Sometimes you can be sitting there and she keeps touching all your teeth and you don’t know if there is anything wrong or not.

Interviewer - Right so you would like her to reassure you if there isn’t anything wrong?

Participant 9b - Yeah to reassure me.

Sub-theme 2: Rewards

The need to be rewarded after a dental appointment was repeatedly discussed by many of the participants. Many children suggested that the knowledge that they will receive a small reward or treat afterwards helps them to cope during the treatment and made the experience on the whole more positive for them.

Participant 2a - Mum says that if we are brave and good at the dental nurse we'll stop for a treat afterwards.

Interviewer - Really? What kind of treat do you get?

Participant 2a - Mum bought us a little pie from the bakery.

Interviewer - A little pie? Yum. So was that afterwards?

Participant 2a - Yes

Interviewer - So if you were brave and went to the dentist you got a little treat afterwards?

Participant 2a - Yip

Interviewer – So did knowing that help you to feel better at the dentist?

Participant 2a - Yip I felt happy.

Interviewer - What else could the dentist do to help you to feel happier about going to see her?

Participant 18b - Well she could give us a sticker or one of those butterfly things. That makes me feel happy.

Interviewer - Yeah a little treat always helps me feel happier.

Theme 4: Distraction

A number of children suggested the need for more activities or tools to allow for more distraction. Many of the participants had experienced some distraction activities at the dentist but felt that they needed more to enable them to cope better.

Many participants mentioned that their dentists had posters with pictures and puzzles on the ceiling for them to complete while receiving dental treatment, but they also suggested the need for more or for these to be changed regularly.

Participant 4a - She has a maze up there.

Interviewer - Oh yes. On the roof above the chair?

Participant 4a - Yeah, it's pretty cool but I've done it lots of times before.

Interviewer - Oh do you think she needs to put a new one up there?

Participant 4a - She could put lots of them up there so when you had finished one you could do another one.

Interviewer - What a good idea!

A desire for music to be used as a tool for distraction or relaxation was made by many of the participants. Bringing their own iPod or MP3 players with them was suggested and others were happy enough for the radio to be playing in the background.

Participant 27a - Yeah it would be nice if she had the radio on. It would make me feel more comfortable.

Interviewer - Yeah? Do you think that you might try to focus on that rather than what she was doing to your teeth?

Participant 27a - Maybe, but it wouldn't be able to block out the sounds of the drill.

Interviewer - No but would it help other times?

Participant 27a - Yes

Some participants hopefully suggested the need for a T.V, DVD player or play station mounted on the ceiling above the dentist's chair for the ultimate distraction device.

Participant 21b - I wish there was a T.V up there to watch.

Interviewer - Yeah? Wouldn't that be great!

Participant 21b - Yeah but it probably wouldn't happen.

Interviewer - Maybe one day all dentists will have them. Do you think it would help you?

Participant 21b - Yip it would make me love going to the dentist.

Many participants wanted to be allowed to bringing things with them from home to help with distracting themselves.

Participant 10b - Yeah if I had known I could bring something from home I would bring my squeezey ball.

Interviewer - Oh yeah. Is that like a stress ball? Something that you squeeze to help you feel better?

Participant 10b - Yip. I'd take that.

In summary, the exploration into what children feel they need in order to cope effectively with dental anxiety uncovered several themes. Being provided with accurate *information* about dental treatment and health is vital for children to be able understand and accept what happens at the dentist. It was clear from the data that the need for accurate information about dental care is not always being met. A need for children to feel they have some *control* of the situation is needed. Allowing children to

make their own decisions about treatment and encouraging them to ask questions and express their needs or concerns during treatment aids children's ability to cope better. Children also expressed a need for the creation of a positive atmosphere in the dental clinic. When the dentist displays a caring and reassuring nature towards the children they tend to cope better. Participants also suggested that receiving a reward after treatment increased their positive feelings about dental treatment. Distraction was another need many participants believed was important in allowing them to cope more effectively with dental anxiety.

From the analysis it is clear that there are strong similarities in the themes uncovered in the analysis for both the coping strategies children used and their needs. It appears that while some children are already using the coping strategies mentioned it may be that if more of their needs were met more children would be enabled to use them and the children who already use them may be enabled to use the strategies more effectively and efficiently. The needs analysis suggests that there are still a number of things that could be improved upon in order to allow children to cope more effectively during dental treatment.

Discussion

The results of this research indicate that there are a number of factors present in dental situations that children find difficult to cope with. These findings are supported in the literature regarding children's dental experiences, though there has been little research into this area specifically. The study also suggests that children use a variety of strategies to help themselves to cope with such factors during visits to the dentist, some of which tend to be more effective than others. This finding is supported by a number of studies, though some of the coping strategies identified vary from the present study. A number of themes representing what participants need to help them to cope better with dental treatment have been revealed. These are closely related to the coping strategies many children said they already employed. If these needs were fulfilled it would enable children to use their coping strategies more effectively.

This chapter will summarise and interpret the present study's findings, discuss these findings in relation to previous research and literature in the area, and a consideration of the limitations within the study will be made. This section will be presented thematically, discussing the three areas of analysis in separate sections.

Factors Triggering Dental Anxiety

Sensations, The Unknown, Negative Beliefs, Loss of Control and Mistrust were the themes that arose from the analysis of the data surrounding participants' responses to questions about what they find difficult to cope with in the dental setting.

Sensations, such as pain and the noise of the dentist's drill, were upsetting and difficult to cope with for many participants. All children reported that pain was the main cause of their dental anxiety. Even participants who had never experienced pain at the dentist before reported that a fear of pain was the most upsetting factor involved in attending the dentist.

It is widely accepted that the expectation of pain will cause most people to feel fear or anxiety and if possible most people will seek to avoid painful situations. In the case of dentistry it is often not possible to avoid painful treatments and people need to face the pain and fear or find ways of coping with it. Anxiety produced by the anticipation of feeling pain at the dentist is well supported by the literature (Prins, 1985; Vassend, et al., 1993) although most research in this area has focused on the cause as being a result of participants' past painful experiences during dental treatment. Interestingly, some of the participants in the present study who had never experienced pain while at the dentist still reported pain as being the major reason for their dental anxiety. It is suggested that parents', siblings' and friends' scary stories may have contributed to this, and this is supported in the literature (Berstein et al., 1979; Klingberg & Berggren, 1992; Klingberg et al., 1995).

The theme of the Unknown encompasses a range of problems reported by children. Being in very close proximity to a stranger caused children to feel anxious. Shyness is often experienced by people when others stand too close whether we know them or not (Willumsen, 2004), so it is understandable that this is also the case during dental treatment. Most children are taught about the dangers of talking with strangers and are warned not to interact with them. It seems reasonable therefore, for them to be wary of having to be so close to someone they do not know, especially when their parents are not present.

Not knowing what is happening to them can cause anxiety. Children may find it hard to comply with dental treatment when they do not understand the sequences of treatment, the reasons for it and the consequences of not complying. It may be that a child's understanding of the reasons for dental treatment depends on their developmental stage and Piaget's theory suggests that this stage may not be reached until the age of 10-12 years (Inhelder & Piaget, 1958). Therefore it is important that children are given age appropriate explanations for treatment to reduce fears of the unknown and of non-compliance.

This need is not limited to children. Petersen et al.'s (1978, cited in Willumsen, 2004) study found that a sample of adults about to receive oral surgery experienced

moderate to severe anxiety before the surgery. They stated the main cause of this was uncertainty due the lack of information provided to them about the procedure.

Many children in the present study held negative beliefs concerning dental treatment. Some children thought these negative feelings had come from hearing frightening stories about others' experiences with the dentist. In the literature concerning the development of fear and anxiety, an information pathway has been identified.

Rachman's theory of fear acquisition suggests that receiving negative information from others can lead to the development of fear and anxiety (Folkman, 1984). Other studies (Townend et al., 2000; Abrahamsson et al., 2002) describe how receiving negative information about dental treatment from others had an impact on their development of dental fears.

The theme, Loss of Control, featured in the data of the present study. The loss of control the participants felt while at the dentist was seen by them as increasing their feelings of anxiety. The suggestion that experiencing feelings of loss of control during dental treatment is evident in much of the research concerning general anxiety in adults, and there is some literature which support this in children in dental specific situations. Milgrom et al. (1992) report that adolescents who described feeling a loss of control while at the dentist were more than 13 times likely to report high levels of dental anxiety and those who reported pain and perceived loss of control were more than 15 times more likely to refuse to visit the same dentist again for treatment than those who had not experienced pain or loss of control.

The participants' feelings towards the dentist impacted on their levels of anxiety. Some children reported that feelings of a lack of trust towards the dentist and their ability to do their job well without harming them caused them to feel anxious. During dental treatment patients surrender a lot of their control to the dentist. A patient is positioned lying down with the dentist leaning over them. The experience can be perceived as being highly invasive to some people, with the close contact and invasion of personal space that is necessary during treatment. If the patient trusts the dentist the loss of control is likely to become less important. Therefore trusting the dentist is essential to get through a dental appointment without undue stress.

There is some evidence in the literature to support this finding. Liddell and Locker (2000) measured participants' attitudes towards dentists in their study which compared those with remitted dental fears with those who were still fearful of attending the dentist. Participants who were anxious and tended to use avoidance coping strategies were less trusting and had more negative feelings towards dentists and dentistry.

In summary, there are a number of factors involved in dentistry that cause anxiety and stress in many people. This study categorised these factors into the five themes of Sensations, The Unknown, Negative Beliefs, Loss of Control, and Mistrust. Distress caused by each of these themes has support from literature. There is evidence to suggest that age and developmental stage may have an impact on what a child finds frightening. For example, younger children may be more concerned with mistrust and the unknown as they are more likely to be affected by anxiety separation. Older children may be more concerned with pain, bodily harm, or maintaining social standards (Ten Berge, 2004).

Coping Strategies

The second aim of this study was to gain an insight into the types of coping strategies children use when attending the dentist. Five themes were identified in the analysis of coping strategies. These were Seeking Reassurance, Control, Escape, Physical Interventions and Passivity.

Seeking reassurance from trusted family and friends when feeling threatened is a normal human reaction. Therefore it is not surprising that in this study many children reported seeking reassurance and comfort from their parents. Participants also looked for reassurance from the dental nurse to aid in their coping. These children needed to receive reassuring comments and positive talk from the dental nurse to help feel more at ease during the appointment. A few children also mentioned that support from their siblings had helped them.

Seeking reassurance as a coping strategy is well supported by literature. Curry and Russ (1984) identified support seeking as being one of the nine coping strategies children use when undergoing stressful dental procedures. This was defined as seeking physical or verbal support from the dentist. Versloot et al. (2004) reported that 38.6% of the 11 year olds in their sample reported holding the nurses hand and 43.4% liked to have their friends with them. Both of these are classified as strategies which seek to reassure.

It is likely that the developmental stage a child is at will influence whether they use physical reassurance from another during dental treatment. It is also possible that older children are less willing to admit to using reassurance as a coping strategy as it may be seen by them as being childish.

It is interesting to note that not one participant in the present study suggested that having a friend with them during dental treatment would have helped them to cope better. Theories surrounding children's social development say that children start to place equal value in their relationships with their friends and parents in late childhood (Buhrmester, 1996). It is interesting, therefore, that friends were not mentioned by any of the older children as helping to support them when they were anxious, as had occurred in other studies with children of a similar age and level of development (Versloot et al., 2004). These studies had, however, used questionnaires with an item asking them directly if they would like a friend to be there to support them. The findings of the present study may have been different if this question was included in the interview.

Another coping strategy under the seeking reassurance theme was self reassurance. Here children used positive self talk and encouragement to seek reassurance in order to ease their dental anxiety. Prins (1985) also identified children using positive and affirming self statements during dental treatment. However a number of other studies have differed in these findings. Versloot et al. (2004) and Van Meurs et al. (2005) did not identify any self reassurance strategies. This is likely due to their use of the Dental Cope Questionnaire (DCQ) which includes only one item referring to self reassurance. This item asks the child if they tell themselves it will be over soon but fails to represent

all aspects of self reassurance as defined in this study. This is a good example of how a questionnaire can limit the richness of participant responses.

The fear induced in many participants as a result of losing control was discussed in the previous section. As losing control featured as a fear implicit in dental treatment, it makes sense that many participants sought to take control of the situation as a way of coping. Children attempted to take control in a number of ways which included using cognitive control techniques, asking questions, asking for help, and taking responsibility for what was happening with their teeth. The children said that these strategies really helped them to feel more comfortable and less concerned. Such feelings of being in control of stressful situations are seen as being important by many theorists (Rotter, 1966; DeCharms, 1968; Seligman, 1975).

Many children used cognitive strategies to take control of the situation and their anxiety. One way they did this was by 'getting real' and forcing themselves to view the situation in a realistic and logical fashion. This stopped them from catastrophising the situation or of seeing the experience as worse than it really was. Others used cognitive self controlling statements to encourage themselves to keep control of the situation and their feelings. Prins (1985) also found this and described children using cognitive manipulation including denial and relativising. Research into adult coping also supports this finding. Kent (1987) investigated adult patient's cognitive control over anxious thoughts and feelings before receiving dental treatment. Most adults in the study reported trying to control their negative cognitions before treatment and the results indicated that those with lower levels of dental anxiety felt they were more effective at using these control strategies than those with higher levels of anxiety.

Another subtheme of the control strategies participants used was 'taking control of the situation'. This is when children reported using strategies that indicated their belief that they had control over what was happening. Examples were asking questions and asking for more help in the form of pain relief or a break.

The children's belief that they could control the adverse outcome of dental treatment parallels to Bandura's theory of self efficacy, which is the belief that one's actions can

control the environment (Steinberg, 1998). The more a child experiences success with their actions the more confident they become in their ability to control.

Experimental studies with adults have demonstrated that when participants are exposed to stressful situations but also experience a strong sense of control they report less stress (Moreland & Logan, 1989; Law, Logan, & Baron, 1994). This has also been found in dental studies with children (Corah, 1973). Such studies suggest why children in the current study wished to gain some control over their treatment to help them to cope.

The theme of escape ran through much of the children's talk about coping at the dentist. Some described plans to avoid the dentist physically while the most common form of escape was to do so using cognitive techniques, such as going to one's happy place.

Few children described using physical efforts to escape from dental treatment, however those that did reported a range of ways of doing so such as crying, throwing tantrums, hiding, and becoming aggressive. Adult studies have found that many adults actively avoid the dentist as a way of coping with their dental anxiety (Vowells et al., 2005). It is possible that children do not attempt using physical escape as much as adults because their parents will often not allow them a choice. This was highlighted when the children were asked if escape techniques were effective. Most of them said they were not and they had to attend the dentist anyway and were able to suggest other strategies they would use once they were there.

It was interesting to note that this theme of escape was one of the most commonly reported coping strategies in this study. When children were asked what they would do or what they thought others who were struggling at the dentist should do, they most often reported a form of escape.

In some previous studies investigating children's coping strategies, the use of cognitive escape was not as commonly reported by participants as it was in this study (Van Meurs et al., 2005), while in others the use of diversionary thinking was found to be a commonly used coping strategy (Curry & Russ, 1985; Versloot et al., 2004). However,

these studies did not attempt to find subtypes within the diversionary thinking strategy. The present study found that children used a variety of different ways to distract themselves cognitively. Some children used the term 'my happy place' which suggests they had been taught this type of escape strategy previously. This term is a cognitive therapy technique that has been used in clinical psychology to help clients deal with anxiety. It appears that the use of this clinical strategy is now being used more and more outside of the clinical field and being used by many different people in everyday life. Other children said they just thought about things that made them happy like thinking about their friends, family or a video game they play or a book they are reading. This is important for dentists to be aware of so they could ask a child questions about what they like doing, or what they are reading and help them to form a happy place they can go to when treatment begins.

Another subtheme of escape was using external escape strategies such as distractions and rewards. Most participants reported using distraction activities supplied by the dentist, such as puzzles that were on the ceiling above the chair. Children did, however, have mixed feelings about how effective these activities were at helping them to cope.

Receiving a reward for attending the dentist was commonly reported by the children as helping them to cope. Many described how rewards helped them to feel more positive about having to go to the dentist and that thinking about the reward they would receive at the end help them to get through the appointment. This would suggest that rewarding the children's attendance at the dentist is not only reinforcing this behaviour and increasing the children's positive feelings about dentistry but the reward is acting as a distraction device to minimise the negative thoughts and anxiety induced by invasive dental treatment. This has not been a finding in many other studies, although Curry and Russ (1985) did identify Positive Cognitive Restructuring, which involves bring one's attention to the positive factors related to the dental visit which could include a reward.

In the present study some children discussed ways they coped with feelings of anxiety and pain by physically using their bodies. These types of strategies were themed into

the three subgroups of tension, relaxation, and release. Tension involved the tensing of muscles in different parts of their bodies. Some tensed their bodies by holding strongly to the arm rests, others gripped their hands together, or held something tightly in their hands. Other children tried to physically relax their muscles or close their eyes in order to aid coping, while others described needing to release the physical tension induced from their dental anxiety and coped by releasing energy through physical exertion.

Though such physical interventions appear to be understandable and common ways people deal with dental anxiety and pain it appears this has been a neglected area within the literature surrounding both children and adult coping during dental treatment. The DCQ, which is used by many studies, does not include any items that relate to physical coping strategies so studies that have used this to assess coping miss identifying such strategies. However, Curry and Russ (1985) who did use interviews did not identify any physical strategies either. Miller et al. (1995) included the clenching and releasing of fists and the relaxation of muscles in their questionnaire but these items were classified as avoidance strategies and did not make up their own category. Prins (1985) reported that children used “regulating one’s breathing pattern and muscle tension” (p. 646), though this category does not include tension and release.

The final group of coping strategies identified in the present study were themed as passivity as they reflect passive attempts to cope with dental anxiety and pain. When asked about strategies they used to help themselves feel better when at the dentist some children reported that they did nothing because they felt there was nothing they could do. Others said they just did as they were told by the dentist. These children believed they had little or no control or power over the dental situation and placed all trust and control in the dentist. Other children relied on hoping, wishing and praying that everything would be okay.

Very few other studies have identified children using these passive types of coping strategies during dental visits. However, studies with adults have recognised similar passive strategies have been recognised. Bernson et al., (2007) identified praying and despair as factors of coping strategies. Their analysis indicated that participants who

rely on these types of strategies were more likely to be irregular in their dental care attendance which suggests they were more likely to use physical avoidance as well.

Piaget's theory of magical thinking provides some support for this study's finding that some children believed that wishing or hoping that there is nothing wrong with their teeth will make it come true (Singer & Revenson, 1996). Theories of child development imply that children are more likely than adults to believe that just wishing will make something true (Bjorklund, 2005).

In summary, there have been a significant number of studies which have focused on children's dental coping strategies. The themes identified in the present study are comparable to the existing literature in the area with a few exceptions. The present study identified physical interventions such as tension, relaxation, and release as being significant strategies used by children to aid in their coping with dental anxiety and pain. Such strategies were not reported in other similar studies.

Much of the previous research into children's coping strategies during dental visits has relied upon questionnaires to gather information. This has limited the information participants could provide to the options made available in the questionnaire. The present studies use of a semi-structured interview has allowed the participants to use their own words to describe their experiences, which has resulted in more detail and a fuller picture of children's coping. The other issue highlighted in this discussion is the difference in categorisation of coping strategies and the terminology used between different studies (Miller, et al., 1992). This makes it very difficult to compare this study's findings with those of others.

Needs

Participants in the present study were asked what type of things would help them to cope better during dental treatment. This was in order to identify possible needs and areas that could be improved upon in order to make the dental experience more positive for children. The themes that arose from the analysis of needs were more

information, increased control, the creation of a positive atmosphere and additional distraction opportunities.

Analysis of the data highlighted a distinct need for children to be provided with accurate information and education about dental care and treatment. Children in the sample displayed a number of inaccurate negative beliefs surrounding dental treatment. Most children had come to believe that pain and dental treatment come hand in hand. Some children who had never personally experienced pain at the dentist still held this association. Some literature suggests that this is due to societal factors where stories and examples have been passed down from parents and older generations who received dental treatment before the development of anaesthetic and advancement in pain relief (Berstein et al., 1979; Klingberg & Berggren, 1992; Klingberg et al., 1995), although there is debate over the strength negative information has on the development of dental anxiety (Ten Berge, 2004). Such negative information may, however, induce some level of dental fear in children which has not been assessed. Today sophisticated methods of pain relief and anaesthetic are readily available and therefore pain is not likely to be as common an occurrence during dental treatment as it once was.

Children in the sample appeared to lack understanding in the reasoning behind receiving an injection of anaesthetic. From the children's accounts it seemed that they were asked if they wanted to have an injection before their teeth were drilled and were not given a clear explanation as to why an injection might be preferable to not having one. As most children would have previously received injections in medical settings and likely found the experience unpleasant it is not surprising that when given the choice of having an injection at the dentist they decide against it without realising the consequences. It is again not surprising, therefore, that these children do experience pain during dental treatment and develop negative feelings and anxiety about future dental treatment. Accurate information about anaesthetic and pain in dentistry needs to be given to children to allow them to be fully informed and to limit children's negative dental experiences.

Analysis also exposed a gap in children's information regarding what was acceptable at the dentist. Children were not aware that it is acceptable for them to bring with them a toy or other comforting possession that may aid them to cope better during a dental visit. Many children said that they would have liked to have done this and that it would have helped them to feel more comfortable but had not known it was acceptable. It may be that dentists have not considered this before and therefore it has not been given as an option. Again it is important that children are informed about their options and given the opportunity to bring things that will aid them with their coping.

Participants in the present study also expressed a desire to be given basic information about what was happening during treatment. Basic information about how long the appointment was going to take and basic details about what they were to expect during treatment was highlighted as being important to a number of children. Providing children with information like this allows them the opportunity take more control of their treatment. It is difficult for children to comply and accept treatment when they do not have an understanding of why they need to have it and what they should expect during treatment (Willumsen, 2004).

Children's need for such information is supported by research into children coping with adverse medical treatment. Dahlquist (1992) suggests that verbal explanations, demonstrations and modelling of what the procedure will involve are effective interventions which aid in the reduction of children's distress. Providing children with such information prior to medical procedures has been supported in a number of studies (Johnson, Kirchoff, & Endress, 1975; Melamed, 1977; Twardosz, Weddle, Borden & Stevens, 1986). This would seem to be a finding that could be successfully put into practice in the field of children's dentistry.

Literature in the area of coping and dental anxiety has suggested that patients, especially those with higher levels of dental anxiety, wish to feel they have some control over their situation (Logan et al., 1991). Children in the present study also expressed a desire to be enabled to take more control of their treatment and dental care. Children suggested they needed to be given the opportunity to ask questions. Dentists can be intimidating to patients especially patients who are children and so

asking questions can be difficult. Dentists need to make sure that their patients know that it is okay and even desirable that they ask any questions they have and voice their concerns before and during treatment. Some children suggested that using signals to show distress or the need for a break from treatment was needed. This may be easier for some children who are particularly anxious about voicing their concerns. Children also indicated a desire for control by suggesting that they wished to be able to control levels of pain relief. Corah (1973) investigated the effect the perception of having control has on stress during dental treatment. To study this effect children were given signals to hold up to show the dentist they were feeling uncomfortable or they wished to stop. The results of the study indicated that children with the device scored much lower on tests of arousal than those children not given the device during stressful dental procedures. A slightly more recent study by Weinstein et al. (1996) looked at children's desire to control. The results indicated that the children with high levels of anxiety when anticipating dental treatment also had a high desire for control. These findings give support to the present study's finding that children's anxiety will be reduced if they feel they have some control over proceedings.

The creation of a positive atmosphere was also expressed as a need in aiding children to cope during dental experiences. Children expressed a need for the dentist to display warmth and friendliness towards them so they felt they could ask for help should they need it and maintain a feeling of control. Looking forward to, and receiving, a reward following dental treatment was enjoyed by many, which also contributed to the positive atmosphere and associations with dental visits.

Literature surrounding coping with dental anxiety has highlighted the importance of a positive relationship and rapport between patient and dentist in order to establish trust which reduces anxiety. Expressions of empathy and friendly guidance can enhance children's co-operation during treatment (Weinstein, Getz, Ratener & Domoto, 1982). There is also literature that suggests if a patient perceives their dentist to be caring, then the negative impact of pain felt during treatment may be less than if the dentist is seen to be cold and uncaring (Berstein et al., 1979; Milgrom et al., 1992). In the same way, negative dentist behaviour has shown to increase dental fear in

children (Milgrom et al., 1992; Townend et al., 2000). This literature supports the need for the creation of a positive atmosphere in the dental clinic.

Although opportunities for distraction were available to the children during treatment many participants said they needed more. Many children reported using the distraction activities provided by the dentist but said that their effectiveness at reducing their anxiety was limited because they were provided with the same activity every visit. A need for such activities to be updated more regularly or more activities to be provided was expressed. A number of children suggested music or TV would help. Many studies have shown that distraction does decrease dental anxiety and increases positive behaviour in children during invasive dental treatment (Anderson & Baron, 1991; Klein & Winklestien, 1996; Prabhakar & Marwah, 2007).

In summary, the area of children's needs in dental settings has been relatively unexplored in previous literature. Particularly lacking is investigation in to what children themselves feel they need in order to allow them to best cope with dental treatment. Analysis in this area highlighted the need for children to receive accurate information about dentistry, allow them more control, the creation of a positive atmosphere in the dental clinic and more opportunities for distraction.

Limitations of the Study

A limitation of this study is the use of convenience sampling. The sample of children came from the same school and it was likely that most of these children had attended the same dentist at some time and this could have impacted on the experiences and coping strategies the children used. This limits the validity of the study's findings.

The study's reliance on the children's retrospective self report of coping strategies during dental treatment could mean that the data collected was not an accurate reflection of the children's actual use of coping strategies at the time. In some cases participants were asked to recall experiences that had occurred some months previously. This problem is inherent in studies that use such methods for data

collection. However it was not possible to assess children's coping during dental treatment as this would have been too disruptive, impacting on the children's coping and their treatment.

One of the aims of this study was to use qualitative data collection methods in order to gain a deeper understanding of children's dental experiences. The use of the semi-structured interview allowed for this but also introduced some possible bias. It is likely that the interviewer influenced some participant responses through her reactions to answers, the use of prompting and the way questions were asked.

Despite these limitations this study successfully provided an insight into children's dental experiences. The particular contributions this study makes include the identification of a number of factors which induce anxiety in children, recognition of a range of coping strategies children employ during dental treatment and the highlighting of a number of needs children identified that would help them cope with dental treatment more successfully.

Implications of Findings

This study allowed children to state the factors that they find upsetting and difficult to cope with during dental treatment. Children were also given the opportunity to discuss what they felt they needed from dentists in order to cope better with dental visits. This is valuable information that paediatric dentists and parents should consider when treating children in the future.

The identification of the factors involved in dental treatment that influence children's dental anxiety has highlighted the need for dentists to address these issues and start to develop methods of reducing their impact on patients. It has also highlighted the importance of parents not transmitting their personal views about dental treatment to their children if they are negative and unhelpful. It may be beneficial for parents to share information concerning their own dental anxiety if they also share the types of strategies they use to cope with it.

Consideration for the coping strategies that have been identified also needs to be given. Dentists and parents can encourage children to initiate the use of such strategies and help them to use them in more effective ways.

Consideration also needs to be made for the needs children have expressed in this study. With the help of schools, dentists could provide more information to parents and children about the processes of dental treatment and its importance to their general health and wellbeing. Consideration for children's age must be made when discussing dental treatment and health to enhance their understanding.

Dentists need to consider the way they behave towards their patients and understand that their behaviour can have a great impact, both positive and negative, on their patient's behaviour. They need to create a friendly and trusting relationship with their clients and allow them to feel they have some control over their treatment. Dentists may even consider implementing a signalling device which patients can use to alert the dentist they need a break or more pain relief. Finally, consideration for investment into enhancing their distraction activities and devices may be worthwhile for dentists.

Future Research Directions

The purpose of the present study was to explore children's anxiety during dental treatment, their coping strategies and their coping needs. This could lead on to future research involving the comparison between the types of coping strategies used and the children's level of anxiety which would provide more information into the effectiveness of different coping strategies. Investigating any relationships between age, gender, and coping strategies would also be of interest.

It would also be worthwhile to investigate in more detail dentists' awareness of children's coping strategies. What types of coping strategies do they recognise and see children using? What strategies do they think are the most effective at enabling children to cope with dental anxiety?

In conclusion, this study has identified a variety of coping strategies that children use to deal with anxiety and pain during dental treatment. It has also highlighted a number of areas that children believe could be improved upon in order to aid in their coping. This information can be useful for dentists and parents of children who experience dental anxiety and are in need of extra support. The study has also suggested that children need to be educated about dental treatment processes and the reasons for dental treatment as this is likely to lessen dental anxiety in many children. A suggestion for dentists to be more aware of their behaviour towards patients and to prioritise rapport building with patients was another outcome of the study. All of these suggestions are aimed at improving children's dental experiences. If children receive positive experiences related to going to the dentist early in life it is likely that they will develop and maintain these positive feelings towards dentistry and will be less likely to avoid dental treatment in the future. This will then lead improved oral health in the community and less cost to society.

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Appendix A



Massey University
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
Te Kura Pūkenga Tangata

SCHOOL OF PSYCHOLOGY
Te Kura Hinengaro Tangata
Private Bag 11 222
Palmerston North 4442
New Zealand
T 64 6 356 9099 extn 2040
F 64 6 350 5673
www.massey.ac.nz
<http://psychology.massey.ac.nz>

14th August 2009

The Principal
[Redacted]

Dear [Redacted]

I am undertaking a Masters thesis in Psychology which involves investigating the coping strategies used by children when visiting the dental therapist or dentist and I am seeking permission for the research to be undertaken at [Redacted] School.

Many of us feel fearful and anxious when faced with visiting the dentist. Occasionally people feel so anxious about the appointment that they make up excuses and avoid going and in doing so they make their dental fear worse. By not receiving regular dental checks they increase their chances of developing dental problems that require unpleasant and invasive procedures, which then reinforces their dental fear. Past research in the area of dental fear has suggested that most often dental fear begins in childhood. The Dental Jungle computer game is a resource we are developing to reduce dental anxiety for children, and there is a second part to the project which gives dental therapists and dentists information on children's feelings, with age and experience linked suggestions for working positively with children coming for a dental visit.

We are approaching your school to participate in a key aspect of the development of Dental Jungle. This involves gathering data on children's coping strategies and experiences of oral health visits. Our project is compatible with health education goals in the New Zealand health and physical education curriculum (2007).

Participation will include completing a brief questionnaire that measures dental anxiety. This is called the Smiley Faces Program and will be completed on a computer. Answering this questionnaire will take approximately 5 minutes. The second part of the study will involve an individual interview with me. The interview will include a number of questions relating to the different strategies the child uses when coping with a visit to the dentist and should take approximately 10-15 minutes. The interview will be recorded on an audiotape so that it can later be transcribed. I would like to hold the interview in a space close to the classroom where the children will feel safe but that has more privacy and less distraction than in the classroom. A teacher's resource room adjoining the classroom would be ideal. To ensure the children's privacy and confidentiality no-one else will be present during the

interviews. However, a support person is welcome to come along should a child or parent feel more comfortable with this arrangement.

In order to obtain an appropriate sample size and make-up I would like to approach one Year 5/6 class and one Year 3/4 class from your school to participate. A letter to the parents and children, an information sheet including details of the study, and a non-consent form would be sent home with the children. This way the parents and children can discuss the study together and decide if they would like to take part.

A suitable time for the data collection to go ahead can be discussed so as to avoid any major disruption for the students and teachers. I intend to ensure that no child participating in the study is disadvantaged.

The children attending your school are under no obligation to accept our invitation to take part. If, after reading the letter, a child decides to participate, they have the right to:

- decline to answer any particular question;
- withdraw from the study;
- ask any questions about the study at any time;
- provide information on the understanding that it is anonymous, and their name will not be linked with any data or used in any publications from the project;
- be given access to a summary of the project findings when it is concluded.

The ultimate aim of our project is to make dentistry positive, but if participating in the project makes a child concerned about dental treatment, parents can contact the team leader, Dr Linda Jones. She can discuss any concerns and give advice.

If you or any parents or teachers have any questions about the project or their child's participation they are welcome to contact me or Dr Linda Jones. Our contact details are on the last page of this letter. I would also like to hold a hui for parents the week before data collection begins where they can ask any further questions and any concerns they have can be addressed.

The Principal of _____ School, _____, has offered to talk to any other Principals about what it was like having the Dental Jungle researchers collect data from three classes in her school over several days. You may contact her for more information regarding this.

With this letter are copies of the letter to Children and Parents, Extra Information for Parents, and the consent form that we would like to send home to the children in your school. We will make sure that there is at least 1 week between sending home the consent form and information letters and starting the data collection. We would like you to read these and let us know if you are happy with them and the proposed distribution process. We will photocopy them ready for your distribution.

What we need from you is your consent for the children in your school to receive this material, and for me to collect data in your school. This way parents can then choose to opt out of the study if they do not wish their children to participate. In return for your school's participation we offer the School \$3 per child up to a value of \$200 worth of books for your library – from a very large selection on teeth, oral health, and going to the dentist, on Amazon.com.

Please contact me if you are interested in having your school be a part of this research or would like to know more.

Yours Sincerely

Rosie Watson
Graduate Student
School of Psychology
Turitea Campus
Massey University
(06) 3531252 or (021)1057667
R.J.Watson@massey.ac.nz

Dr Linda Jones
Senior Lecturer
School of Psychology
Wellington Campus
Massey University
(06) 356 9099 extn 6530
L.M.Jones@massey.ac.nz

- ◆ *This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application 09/38. If you have any concerns about the ethics of this research, please contact Professor Julie Boddy, Chair, Massey University Human Ethics Committee: Southern A, telephone 06 350 5799 x 2541, email humanethicsoutha@massey.ac.nz.*



If you had to go to the dentist for treatment TOMORROW, how would you feel?



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Semi-Structured Interview Schedule – Dental Coping Strategies

Introduction

Thank you for being willing to take part in this interview. I really appreciate your help with my research. Before we start there are few things I need to tell you. Because I'm going to be asking you a few questions and it will be hard for me to remember all your answers I'd like to record our voices on this tape recorder. I'll show you how it works. When I press this button it copies what I say. If you press the button for me I'll say my name and then ask you yours and we can play it back so we can hear ourselves. Is it okay if I leave the tape recorder on while we talk?

I also have to tell you that everything you tell me today will be kept anonymous. Do you know what that means? It means that no-one else will be able to tell it is you who was interviewed today. This way you don't need to feel worried or embarrassed that other people will know what you tell me.

It's also really important that you know that there aren't any right or wrong answers to any of the questions I'll ask you and if you don't want to answer any of them you don't have to. You can also stop the interview at anytime you want to. Please ask me questions anytime – especially if you don't understand the question.

Are you ready to start?

Warm up questions:

Home...school...etc

What do you like doing at school...home?

Favourite T.V programmes, movies, things to do?

Main Interview Questions

1. Can you remember the last time you went to see the dentist or dental nurse?

If yes take details of:

-Can you remember why you were there?

-How did you feel? Scared, nervous, relaxed

-Did it hurt?

If no take details of:

- Can you remember another time you visited the dental nurse/dentist
- Can you remember why you were there?
- How did you feel? Scared, nervous, relaxed
- Did it hurt?

2. What was it that made you feel like that?

What happens at the dentist that you don't like or makes you a bit scared/nervous etc?

3. Can you think of a time when you went to the dentist? Was there anything you did that helped to feel better about being there? Like a trick?

Prompt if answers no – Can you think of someone you know that doesn't like going to the dentist? What things do you think they do to help them get through it? Pretend you have a friend that doesn't want to go to the dentist. What things would you suggest they do to help them get through it?

Prompt: Some people do different things to help them cope with a visit to the dentist. It could be anything like trying to think of something else that makes you feel happy or to talk to yourself inside your head. Some people like to hold someone's hand to help them feel better. Some people like to know exactly what the dentist is doing and want the dentist to tell them as much information as they can about what is happening. Is there anything you do with your body that helps?

4. How well do you think the tricks you told me about help you to cope?

5. Can you think of any other tricks you have used?

6. Is there anything you say or think to yourself when you are sitting in the dentist's chair? If so tell me about them.

7. Is there anything you try to think about or not to think about when you are at the dentist?

8. Do you think these things help make you feel better or happier?

9. Can you think of some things that the dentist or nurse could do that will help you to feel happier while at the dentist?

10. Is there anything else that would help you to cope better at the dentist?

Prompt: Some dentists put things on the ceiling above the patient's heads so they have something to read. Others might let you listen to music or a story on an iPod. While others like to tell you exactly what they are doing to your teeth and give you a mirror so you can see what is going on in your mouth.

11. How well do you think the ideas you told me about would help you at the dentist?

Debriefing

Okay, I think that has covered everything I wanted to talk with you about. Do you have any questions you want to ask me?

Thank you for your help....you know lots of useful ways of coping with going to the dentist/you cope really well with going to see the dentist/dental therapist

Appendix D



Appendix E





Massey University
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
Te Kura Pūkenga Tangata

SCHOOL OF PSYCHOLOGY
Te Kura Hinengaro Tangata
Private Bag 11 222
Palmerston North 4442
New Zealand
T 64 6 356 9099 extn 2040
F 64 6 350 5673
www.massey.ac.nz
<http://psychology.massey.ac.nz>

Massey University Children's Dental Jungle Project Children and Parents' Information Letter

Kia ora Children and Parents

We would like to invite you to help us with the development of a new computer program we have started making called DENTAL JUNGLE. We need school children's help to tell us more about the way they feel when visiting the dental therapist and the ways they cope with these feelings.



DENTAL JUNGLE has games to help kids enjoy going to the dental clinic or dentist. Lots of people already do feel happy about dental appointments. Five and six year olds like having their teeth counted because they are just starting to get new big, permanent teeth. But not everyone is ok about going, and some children call the dental clinic names that are silly or scary. That can make other kids scared about what is going to happen at the dental clinic, when it is really all about them keeping their teeth healthy so they can have healthy and strong permanent teeth.

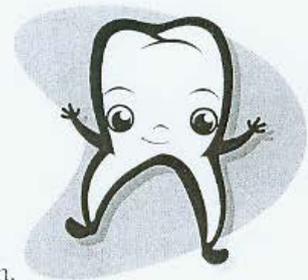
We are asking the children at your school to help us. Please talk about it, and if you are happy to help we will see you in class. If you do not want to help then please return the CONSENT page at the end of this letter with the NO circled, and return it to your teacher before **Monday 24th of August.**

We need lots of children to play one of the Dental Jungle games that we have made, about children's feelings about going to the dental clinic. In Dental Jungle it is called Smiley Faces. We have talked to your School Principal and teachers about it and you can try the game on a laptop, in your teacher's resource room.

There are other puzzle games in Dental Jungle that we are still working on. We haven't finished it yet, because we need children to tell us different ways they cope with the way they feel when visiting the dental clinic. We are looking for as many children as possible to take part in this. It will take a total of about 15 to 20 minutes of class time.

We will be giving your school \$3 for every child who volunteers, up to a maximum of \$200, to go towards books for your school library, for the help we are getting from you and your school.

Thank you for reading the letter. I hope you will help.



Rosie Watson.

Massey University Children's Dental Jungle Project

Extra Information for Parents

Thank you for reading our Letter to Children and Parents. Negative feelings and attitudes towards dentistry make it hard to achieve good oral health practices for life. The Dental Jungle computer game is a resource we are developing to reduce dental anxiety for children, and there is a second part to the project which gives dental therapists and dentists information on children's feelings, with age- and experience-linked suggestions for working positively with children coming for a dental visit.

We have approached your school to participate in a key aspect of the development of Dental Jungle: gathering data on the types of coping strategies used by children when visiting the dentist. This will include an interview between your child and the researcher, Rosie Watson. The interview will take part in the teacher's resource room at the back of the classroom. There will be no-one else present during the interview unless you or your child wishes to have a support person present with them. If this is the case then please let the classroom teacher know so that we can arrange a suitable time for everyone. The collection process will take approximately 15-20 minutes of class time. Our project is compatible with health education goals in the New Zealand health and physical education curriculum (2007).

We are happy to have up to 40 children to offer to talk about the coping strategies they use when visiting the dental clinic, and you can say if you do not want your child to be asked to do that.

You and your child/children are under no obligation to accept our invitation to take part. If, after reading the letter, your child decides to participate, they have the right to:

- decline to answer any particular question;
- withdraw from the study;
- ask any questions about the study at any time;
- provide information on the understanding that it is anonymous, and their name will not be linked with any data or used in any publications from the project;
- be given access to a summary of the project findings when it is concluded.

Please note that we do not look at your child's teeth. This is not about their teeth but how they feel about attending the dentist and the ways they cope with these feelings. The interviews will be held in the teacher's resource room and will be conducted by the researcher, Rosie. If your child wishes, they are welcome to have a support person present throughout the interview. Please inform your child's teacher if they do wish to have a support person present so a suitable interview time can be arranged.

The ultimate aim of our project is to make dentistry positive, but if your child is concerned about participating in the project due to having to talk about dental

treatment, please contact Dr Linda Jones at the School of Psychology at Massey University, Wellington. She can discuss your concerns and advise you.

If you would like to talk to Rosie about the project, or have further questions, she will be available for meeting with parents on *(Wednesday the 19th of August from 2.30pm – 3.30pm)* in the Library. Alternatively you could use the information sheet details to contact Linda at Massey University.

Rosie Watson
Graduate Student
School of Psychology
Turitea Campus
Massey University
(06) 3531252 or (021)1057667
R.J.Watson@massey.ac.nz

Dr Linda Jones
Senior Lecturer
School of Psychology
Wellington Campus
Massey University
(06) 356 9099 extn 6530
L.M.Jones@massey.ac.nz

- ◆ *This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application 09/38. If you have any concerns about the ethics of this research, please contact Professor Julie Boddy, Chair, Massey University Human Ethics Committee: Southern A, telephone 06 350 5799 x 2541, email humanethicsoutha@massey.ac.nz.*



**Massey University Children's Dental Jungle Project
Consent Form**

Kia ora _____ School Parents

Dental Jungle researcher, Rosie Watson, will be in your school in between Monday 24th and Friday the 28th of August. Your Principal, _____, is happy for us to see all the children, in Room 8 and Room 3, so...

- ◆ **send back this form only if you do not want your child to participate.**

Participation will include:

1. **Playing** the Smiley Faces game (5 minutes of your child's time)
2. **Talking** about the way they feel when visiting the dentist and the things they do or think about in order to cope with these feelings (audio-recorded) (10 to 15 minutes of your child's time)

YES NO

Child's name

Parent / Guardian's printed name:

Signature

THANK YOU

Note that this consent form will be archived at Massey University for five (5) years.

Request for Summary of Findings

Every child who participates in this study is entitled to receive a summary of the findings once it has been completed. If you and/or your child would like to receive a summary then please fill out the postal details below.

Street Address:

Town/City:

Postcode:

Alternatively on conclusion of this study a summary of the findings will be sent to your child's school. You may be able to read it there or pick up a copy there.