

Dental Fear in Children – a proposed model

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Over the past eleven years, we have worked together to treat children who are dentally phobic. This has enabled us to develop an understanding of how children come to be dentally fearful. We have constructed a model of child dental fear which helps us in our work.

It is important to acknowledge that fear is a normal phenomenon when any of us are exposed to threat. Helping dentally fearful children appraise or evaluate threat, face their fear and build upon their strengths is the task facing dentists and, occasionally, psychologists. The consequences for children of not doing so are extreme difficulty with accepting and ultimately total avoidance of treatment. Both of these can persist into adulthood.¹

First, we propose to discuss the normality of fear in children, placing dental fear within a developmental context. We will then outline a model for assessing and treating dental fear which identifies five discrete but interrelated factors. Each of the factors and its treatment is illustrated with examples.

Fear as a normal phenomenon

Fears are found throughout childhood and adolescence. Fear is often considered to be an essential and inevitable emotion, augmenting the 'fight or flight' response in times of danger and providing an impetus to caution and prudence, thus providing children with a means of adapting to the stresses of life. It is therefore normal for children to be afraid of new and potentially threatening situations. It is also reasonable for them to be scared of something, or a situation, which has harmed them before.

A first response to a feared object or stimulus is to avoid or escape the fearful situation. Avoidance reduces fear and is therefore rewarding. Unfortunately, it does not allow the individual to find out if his first impressions were correct or not; that is, it reduces the opportunities for learning.

Prevalence studies describe varying incidence of dental fear in children in Northern Europe (3% – 21%), depending on the age of the child and the measure of

dental fear used².

In general, girls report more fears than boys³. There is constant debate as to whether this is due to:

- an inherent timidity in girls
- their upbringing (adults encourage girls to display their fear and boys to hide it)
- boys being less willing than girls to disclose their fears.

In reality, all three factors are probably acting.

There is an increase in the number of fears from infancy into young childhood, some studies showing a peak at 11 years old, and then general decline in the number of reported fears into adolescence. Some studies have shown that there is an increase in the number of reported fears around the age 9–11, peaking at 11³.

Intense fears are comparatively rare in childhood and there is a spontaneous improvement in many of them. When they do persist, they develop into phobias or 'clinical fears'. These cause distress, are more resistant to change, and may require therapeutic intervention. It is important to note that there is no way to predict which intense fears will spontaneously resolve and which will go on to meet the

two years duration of 'phobia'.

A phobia is often regarded as special form of fear which:

- Is out of proportion to the demands of the situation
- Cannot be explained or reasoned away
- Is beyond voluntary control
- Leads to avoidance of the feared situation
- Persists over an extended period of time
- Is unadaptive
- Is not age or stage appropriate

Clinically, fear usually has to reach the level of phobia before it is treated. This is commonly considered to be a fear which has a duration of more than two years or an intensity that is debilitating to the client's lifestyle. These strict definitions may need a more liberal interpretation when considering dental fears and phobias. Many children are not allowed to avoid, even if they would wish to, and the dental and, sometimes, the general health of children could be seriously affected if avoidance for two years was used as a criterion for treatment.

Dental fear:

- can arise because of particular events e.g. past trauma in the dental surgery² (previous learning) or during other medical procedures (the generalisation of fear).⁴
- can be transmitted from an anxious parent or friend, reading a comic or watching TV (vicarious learning)^{2,4}
- may be located in the vulnerability of the individual, who may be inherently fearful and thus more vulnerable to being traumatised.⁶ The more robust the child, the greater will be the capacity to deal with events.

The Relationship Between General Fear and Dental Fear

The nature of the fears change as children mature and their cognitive capacity increases. In infancy and very early childhood, fear is usually a reaction to the immediate environment, for example loud noises and looming objects. A very young child may find the smells of a dental surgery and the sounds of the

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equipment working overwhelming. It would be perfectly reasonable for a toddler to view a dentist in protective glasses and face mask as 'a large, looming object'. Visits for a toddler to the surgery with happy older siblings or parents need not actually accomplish an examination, but serve to familiarise the child with this strange environment. Often, if left to explore quietly on her/his own (a careful check on safety being maintained unobtrusively by surgery staff) s/he will spontaneously act out appropriate behaviour such as climbing onto the dental chair.

By the early school years the fears have broadened to include the dark, staying alone (examples of fear of the unknown, which peaks at the age of nine), imaginary figures, objects and events (e.g. supernatural figures), particular people and objects and events, for example animals and thunder. At about 9 years old, fear of bodily injury also begins to feature strongly.³ These fears may reflect our child-rearing practices. Parents spend a good deal of time teaching children to 'appraise' or assess situations for potential danger or threat: crossing the road, not touching hot saucepans, not talking to strangers. The appraisal or assessment of situations is based on either previous knowledge (imparted from others e.g. mother, friends, the TV [vicarious learning]) or experience. If you get burnt touching a hot saucepan once, you are less likely to touch one a subsequent occasion. Similarly, an unpleasant experience at the dentist may make children less willing to attend again. Reappraisal of threat may solely be due to greater cognitive ability producing a different assessment of the situation. This is the basis of deferring non-urgent treatment in non-cooperative children. Conversely, all dentists will have treated happy children who, six months later, are wary on entering the surgery. They insist that no-one has told them any horror stories; it seems to be that greater maturity brings an increased awareness of the potential threat and a re-appraisal of the situation. Sympathetic handling at this juncture,

and still greater maturity, should allow further re-appraisal and thus resolve the problems.

Then, in adolescence, fears are centred around social acceptance (failure and criticism) and the future, for example the opinions of the peer group and school results and performance. This means that some teenagers will be particularly sensitive to perceived criticism of their oral hygiene (associated with criticism of appearance and a sense of failure) and of their diet.

A Model for Treating Dental Fear in Children

We believe that there are five factors which are important in the aetiology and perpetuation of dental fear:

- 1 *Fear of pain or its anticipation*
- 2 *A lack of trust or the fear of betrayal*
- 3 *Fear of loss of control*
- 4 *Fear of the unknown*
- 5 *Fear of intrusion*

Factor 1: Fear of Pain or its Anticipation

The link between actual or misinterpreted pain, or the anticipation of pain, and dental fear is well established.^{2,4} Unfortunately, discomfort and sometimes pain can still be a feature of dental treatment today no matter how careful we are about trying to ensure adequate analgesia.⁷ This ensures that there is a genuine basis for anxiety.

The other problem is that individuals, especially children, have their feelings of pain denied. We frequently see children who report that they said that they were experiencing pain, but the dentist ignored them and carried on.

Problems that a dentist is convinced are associated with misinterpretation of pain may be addressed by explaining the gate theory of pain. A very basic explanation which is suitable for children as young as five is as follows. 'You have lots of different types of telephone wires called nerves going from your mouth to your brain (touch appropriate body parts). Some of them carry "ouch!" messages and the others carry messages about touch (demon-

strate) and hot and cold. The sleeping potion stops the ouch messages being sent, but not the touch and the hot and cold messages. So you will still know that I am touching the tooth and you will still feel the cold of the water. Your brain looks out for messages all the time. If you are convinced that it will hurt, it will. This is because if I make the ouch nerves go off to sleep and I touch you, a touch message gets sent. But your brain is looking for ouch messages and it says to itself, 'There's a message coming. It must be an ouch message.' So you go 'ouch' and it hurts, but all I did was to touch you. It's just that your brain was confused.' (The language may, of course, be adjusted for older children.) If this fails to work, then active treatment should be stopped.

Factor 2: Lack of Trust or Fear of Betrayal

Rotter defines trust as, 'An expectancy held by an individual or a group that the word, promise, verbal or written statement of another individual or group can be relied upon'.⁸ An abuse of trust by one dentist may result in all dentists being distrusted. Distrust of medical personnel may generalise to dentists. Trust may also be learned either directly from the behaviour of parents, peers and so on, or indirectly from statements from others or observation of behaviour. It is therefore theoretically possible that children learn to trust or distrust dental or medical personnel from their parents before they have any direct contact with such personnel (vicarious learning).

The research evidence that is available in adults, suggests that trust of the dentist is an important factor in dental fear.⁹ There is no formal evidence to date of this in children, though clinical experience strongly suggests that it is important.

It is up to each child to give trust to a person proven to be trustworthy. At times it will not be given.

Factor 3: Fear of Loss of Control

Children are used to being cared for, or controlled by, parents and those in loco-

parentis. They have an innate sense though, of the boundary that defines social from personal control. While they are more or less happy to accede to parents' and teachers' requests to start or stop activities, their reaction, for example, to a request to 'stop breathing', clearly demonstrates that there are limits to their compliance. Experience for children within the dental surgery parallels the example above. At the simplest level, no amount of exhortation to stop being terrified can, in itself, achieve compliance, whereas children (usually) readily accept modest demands to get in the chair and open wider.

The dental surgery might be considered to be an inappropriate setting for devolving control to children. Indeed, it is often quite difficult to ensure that they have some control when their mouths are full of dental instruments.

Perceived or experienced control is the critical factor and absolute or objective control may not be required. Perceived control is achieved through

- the provision of information e.g. the 'Tell-Show-Do' technique, which also serves to reduce the unknown (see below). Overtly offering children the opportunity to ask questions enhances their control over information gain.
- offering decisional control. Letting a four year old child choose which tooth to polish first (not whether they have the polish or not) gives them an appropriate degree of control. Six-year-olds are capable of deciding whether or not to have a local anaesthetic for a particular restoration, but not whether or not to have the restoration. 10-year-olds may request that easy treatment is completed at a particular appointment because they have exams afterwards or they are not feeling well.
- offering control over the noxious stimulus e.g. a hand-up stop signal or a supervised 'play' with the equipment. (The latter is a particularly good way of dealing with non-acceptance of the aspirator.) There is some evidence that introducing a stop signal for a non-stressful situation may heighten anxiety.

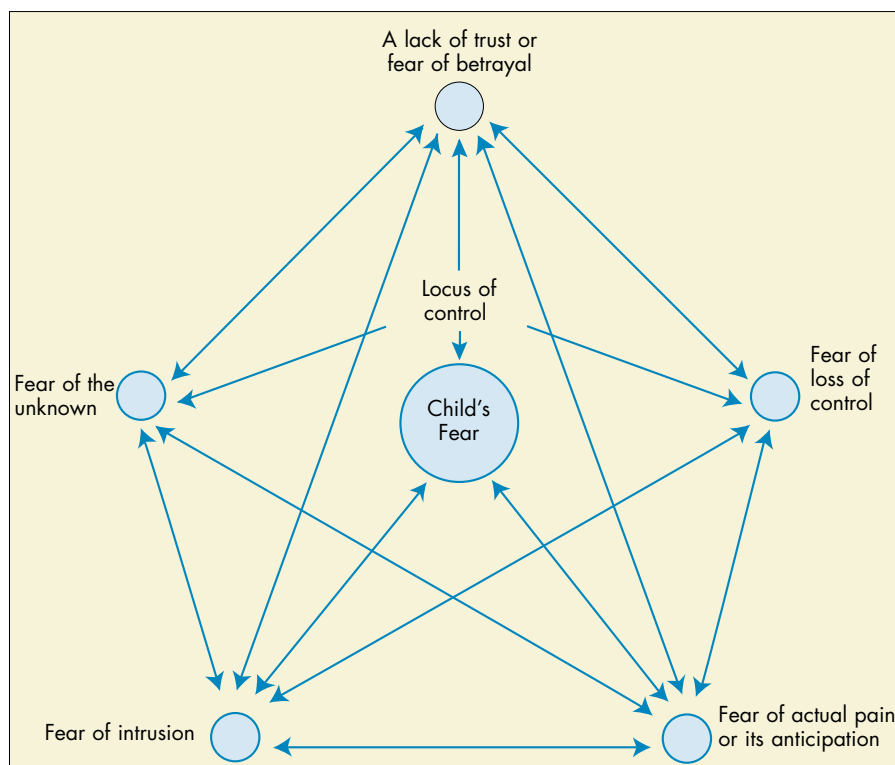


Figure 1 Proposed Model of Dental Fear in Children

ety.¹⁰ Presumably, this is because it raises the awareness of the possibility of pain or threat. Thus, the introduction of a stop signal during a prophylaxis would be appropriate for children who were showing signs of fearfulness, but would be inappropriate for those who are obviously confident.

It is important to remember that the level of control offered to a child has to be developmentally appropriate. In the absence of any research data, this must be a matter of clinical judgement.

An appropriate level of perceived control can be highly protective in potentially traumatic situations.

Factor 4: Fear of the Unknown

In anyone's eyes, a visit to the dentist may be classified as a potentially threatening situation. Any appraisal of the situation is going to be done from that point of view. 'Helpful' comments from the mother such as, 'It won't hurt,' even before an examination, are going to raise the possibility in the child's mind of being hurt. However, it is important to provide accurate information about possible discomfort immediately before the event. Provision of such information a long time in advance may only serve to increase fear of the unknown and the anticipation of pain.

The poorer the quality and quantity of information provided by the dentist about the situation, the more important

such misinformation from others becomes. Inadequate information also results in a reduced likelihood of the normal reactions to uncertainty and fear being overcome. The provision of a developmentally appropriate level of information will not only reduce fear of the unknown, but also foster a sense of control as described above.

The most usual way in which a dentist provides information is the 'tell-show-do' technique. We would suggest that 'explain-show-do' is a better maxim. It suggests a less didactic approach with a broader information base; not only what an item of equipment is and how it feels, but what it does. It offers an opportunity to try equipment in a non-threatening way in the mouth as well as on a finger. For example, the airtor is a 'tooth shower' which whistles and squirts water. It washes the dirt out of teeth. A demonstration out of the mouth can be followed by a demonstration in the mouth. If no bur is used, the chuck may be 'stroked' against the tooth to assist in the understandings of the sensations to come. An anaesthetised tooth may be compared with the contra-lateral tooth to pre-empt any misinterpretation of residual, non-painful sensations, such as vibration, from the tooth during cavity preparation. This is particularly important prior to use of the slow handpiece, where the vibrations are often misinterpreted as

pain (see below). Above all, 'explain-show-do' overtly offers permission to ask questions and request further information.

Factor 5 : Fear of Intrusion

Dentistry is invasive: X rays, fillings, extractions; that is, it is primarily on a physical dimension/plane. Intrusion is more subtle. It involves impinging on the patient's personal space and into a bodily cavity; the mouth. It involves touching. And all this is only for an examination. Impinging on a patient's personal space is something that is taken for granted by professionals. They perceive this as part of their caring role, even if the patients dislike the procedure intensely.

Some children find this invasion of personal space very threatening. It may evoke withdrawal by younger children and comments, usually from older children, such as, 'I don't like the thought of that thing squirting up inside my tooth,' 'The bottom injection feels as if it is going down the back of my throat.' 'I can cope with injections anywhere else, but not in my mouth.'

The impact of four-handed dentistry was described by one child like this, 'I hate being all crowded in when you [dentist and nurse] have your eight hands in my mouth.'

Intrusion may also involve a threat to the persona. For example the child who refuses to attend because every visit involves perceived criticism from the dentist about how poor his/her diet is and how inadequate his/her cleaning. This is demoralising. HRC spotted a successfully desensitised 8-year-old child in the shopping centre one Saturday, eating sweets. A smile and the remark, 'I can see you,' were the only comments made which were pertinent to the 'offence.' When a sibling attended for treatment the following week, the mother reported that her eight-year-old would be quite happy to have any treatment necessary, but was terrified of receiving a 'good telling off.'

Threat to the persona may be as subtle as the dentist using his/her powers

of persuasion to gain compliance with a previously agreed task which is currently being refused. For example, an older child became anxious that H. R. Chapman (HRC) would persuade her to comply with previously agreed tasks. This had been successful in helping the child to progress through a desensitisation package until the point was reached when she became highly anxious that HRC would be a 'snake charmer', intruding into her persona and 'manipulating' her so that she complied against her own free will. Most children would accept such persuasion as demonstrating faith in their ability to complete the task, but for this child, it was construed as the dentist overriding her decisional control.

Fear of intrusion is the most difficult part of the model for the dentist to address.

The model described above may be summarised by Figure 1 on page 410.

Linking Constructs

This model enables the dentist to identify the major source of fear. By building up children's strengths and minimising their vulnerability, even relatively small changes can make considerable differences.

The model is not static or unidirectional. The factors seem to be inter-related to some extent as illustrated in the last example of intrusion/decisional control.

One of the most readily identifiable links is that of 'locus of control'¹³, which links fear of the unknown with fear of loss of control. Locus of control reflects/determines the level of information individual children need to reduce their fear of the unknown and it also determines how much control they instinctively need. 'Locus of control' may be defined as 'an expectancy that reinforcement is under one's own control.' This expectancy was presumed to result from generalisation of previous experiences and reinforcement of control. Locus of control may be 'internal' (coming from within the person), or 'external' (coming

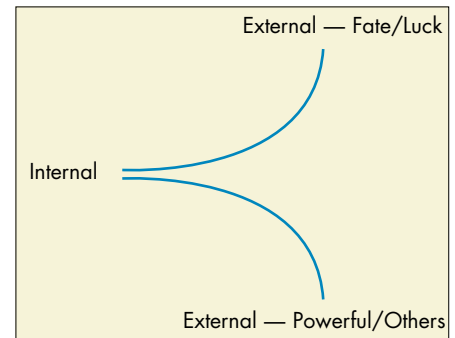


Figure 2 Locus of Control

from outside the person). External locus of control may be sub-divided into 'fate/luck' and 'powerful others'. (Figure 2)

There is a continuum along the scale with very few children falling at either extreme of the scale. Individuals may have varying loci of control for differing situations, but they are unlikely to differ enormously, tending to cluster around a point on the continuum.

Children with a strong internal locus of control will want to actively participate in decision-making with regard to things such as treatment planning. They will require quite a lot of information before they take any decisions. (This is best facilitated by the use of sketches to explain technical procedures at an appropriate level.)

Children with a 'powerful others' external locus of control may say, 'You're the expert, Doctor; you do what you think is best' or 'What do you think I should do, Mummy?' This type of child may be obviously distressed and yet fail to use the agreed stop signal. They may need to 'learn' how to use it by practising use of the signal during an atraumatic procedure such as a prophylaxis.

Children with a fatalistic external locus of control will persist in ascribing their high decay rate to having 'soft teeth like my mum' rather than to the constant consumption of sweets, no matter how often it is explained otherwise.

An easy way of assessing young child patients' locus of control is to offer a choice of two pairs of protective glasses to wear. Children with a strong external locus of control will not be able to choose. Forcing decision taking will result in

stress. Individuals with a strong internal locus of control will be very positive in the choice. Children with an intermediate locus of control will 'not mind' (ie can't choose) about the choice of glasses, but will choose which tooth to polish first during a prophylaxis.

Flexibility of the model

This model works to explain both increases and decreases in the level of fear experienced. For example:

- fear caused by the unknown can be addressed directly by providing information (explain-show-do), but also indirectly by increasing perceptions of control and trust.
- improving trust and control will reduce fear. Conversely abuse of trust and lack of control will increase fear.
- Pain and/or the denial of its experience will heighten fear. The provision of information about possible pain, the recognition of pain and steps taken to deal with it will reduce fear.

There are occasions when it is not possible to directly manage the important variable e.g. a painful procedure where, for some reason, total pain control is not possible. By working on one or more of the other variables, it may still be possible to influence the outcome for the child for the better.

The multi-directionality of the models particularly important when dealing with fear caused by concerns over intrusion, the factor which is the most difficult to address directly. But this may be dealt with by addressing one or more of the other four factors. A sympathetic approach to the problem, coupled with a negotiated control over the intrusive procedures and a fostering of trust are the best approach. Consider, for example, the following scenario where an older child for whom the unknown, anticipated pain and intrusion were particularly important, was given significantly more control over the noxious stimulus (an inferior dental block) than dentists would normally consider giving. The child had been seen by HRC over the course of several years, and issues of trust had been dealt

with previously. She had successfully been desensitised to infiltration injections, but had to have an inferior dental block for restoration of a first permanent molar. The child's need for detailed information meant that she demanded to know if a lower injection would be any different. HRC, feeling that to falsely reassure her that it would be exactly the same as an infiltration would be an abuse of trust, explained very carefully that it would feel a little different. The child took this to mean that it would be painful and that topical anaesthetic would not work. (Topical anaesthetic is routinely used for inferior dental blocks with anxious patients because they expect it, having been used to it being used for previous infiltrations. Not using it generates anticipatory anxiety that an IDB will be different for an infiltration.) She also explained that she didn't like the idea of the local anaesthetic squirting into her and the idea that the needle would penetrate further in than in the top jaw, having to pass through a greater depth of tissue. These were issues of intrusion. To overcome the impasse which arose, the child was given a probe and carefully supervised while she 'prodded' the back of her mouth where the topical anaesthetic paste had been placed ready for administering the local anaesthetic. This was substituted with the anaesthetic needle by HRC and the block was duly administered. A very high degree of control had been used to circumvent the issues of intrusion and pain.

Contextual Variables

The whole model is constantly shifting with time. This 'third dimension' reflects the changes in children's perceptions, understanding and abilities brought about by learning and maturity.

Maturity will usually work in a positive direction, serving to reduce fear. The notable exceptions are:

- fear of the unknown (see above)
- fear of failure and criticism which have their normal developmental peaks at nine and during a adolescence respectively.

Learning, for example vicarious learning (including mothers' communication of their own dental experiences), can operate either positively or negatively, increasing or decreasing fear. It is up to the dentist to ensure that positive learning experiences are provided in the dental surgery.

Summary

We have described a model of the management of dentally fearful children which helps:

- to address the issues at a developmentally appropriate level.
- to identify the source of the fearfulness, if possible
- the child to face the threat by building the child's strengths in that area.

Even if, for some reason, this is not possible, it may be possible to address one or more of the other areas, exploiting any favourable opportunities and building on existing strengths.

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