Applying the Social Learning Theory to Children with Dental Anxiety

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Abstract

Through a review of the literature dental anxiety has been found to be prevalent and problematic within the child population. Dentists are forced to treat the dentally anxious child in such ways that do little to reduce the anxiety of the child and in some cases cause dental anxiety to increase. This article seeks to apply Albert Bandura's social learning theory to reduce dental anxiety in children, in a preventative nature. A description of the social learning theory is offered as well as evidence indicating the effectiveness of applying the social learning theory to dental anxiety in children. Finally, suggestions for applications within the dental office are discussed.

Keywords: Dental anxiety, social learning theory, fear development, modeling

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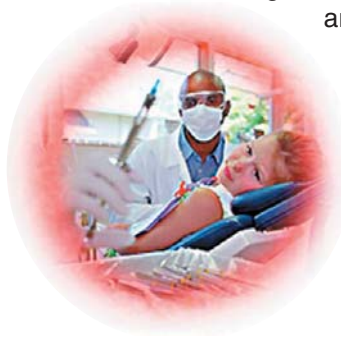
Introduction

The focus of this article is to explore the concept of reducing dental anxiety in children by utilizing the social learning theory developed by Albert Bandura.[1] There is a lot to be reaped by the cross section of psychology and dentistry. The concept of fear or anxiety is purely psychological in nature, but when fear is applied to the field of dentistry the two fields must work hand in hand to help both patient and dentist achieve the best care for children suffering with dental anxiety. This paper will begin by discussing the prevalence of dental anxiety in children. The focus of the paper will then move to how dental anxiety is learned in children and into a specific discussion on the social learning theory developed by Albert Bandura. The majority of this paper will apply the social learning model to dental anxiety and explore options dentists have in reducing anxiety in their child patients. The references discussed in this paper were found by using the literature search engines Psych-Info and Medline.

Prevalence of Dental Anxiety

A child ridden with dental anxiety presents a challenging situation for any novice or advanced dental practitioner. Levy and Domoto found dentists consider the fearful disruptive child to be among the most problematic in their clinical work.[2] Yet, dental anxiety has been found to be prevalent within the child population. Raadal et al. reported out of a sample of 895 urban US children from the ages of 5 to 11, 19.5% of the children were found to have high levels of dental fear.[3] Within the age group of 14-21, 23% reported to have extreme dental fear.[4] Further studies have suggested the age period between 6 and 7 years is a time when the greatest dental anxiety exists.[5] Herbertt and Innes found children from the age range of 8-9 years were the most stricken with dental anxiety and the least cooperative during dental treatment.[6] Children between the ages of 4-14 reported specific fears of the dentist, with the highest ranking being choking followed by a fear of injections and drilling.

The problem with dental anxiety in children is not that it exists, but the anxiety related behaviors negatively effects the dental treatment of children. High levels of fear in children during dental examinations predicted the degree of disruption during actual dental treatment.[7,8] If a child refuses to open his or her mouth, or worse decides to tantrum in the middle of a dental procedure, the child is left without the necessary dental treatment. Children are left with little knowledge of how to positively address their dental associated fears; thus, they revert to destructive ways of coping such as refusal and tantrums during dental treatment.

The inability to treat children with dental anxiety is considered to be an important public health concern recognized by the dental community. Corah's study indicated three quarters of the dentists surveyed reported patient's dental anxiety was the greatest barrier to regular dental care.[9] If dental anxiety is not reduced in the beginning of a child's dental treatment, it can grow and become even more devastating to the child. There is evidence to suggest a child's disruptive behavior due to dental anxiety, if left unchecked, actually increases with additional dental treatments.[10,11]

The problems associated with dental anxiety are not limited to the dentally anxious child. The dentist involved with treatment of dentally anxious children also endures difficulty. Along with the frustration that would understandably occur with a resistant, disruptive child, a dentist may also suffer from anxiety. Melamed and Williamson reported many dentists admit they themselves become anxious when working with anxious patients.[4] The combination of frustration and anxiety felt by the dentist could possibly be projected unconsciously back onto the child, making the dentist visit even more unpleasant for the child and creating a never-ending cycle of anxiety between dentist and child.

How Does this Fear Develop?

In order to reduce dental anxiety in children, it is important to understand how this fear developed or was learned by the child. The majority of the psychological field believes fears are learned, which is very important for the focus of this paper. If a fear can be learned, it can also be unlearned. Rachman developed a model to describe how fear is learned.[12] Rachman's model consists of three main pathways of learning fear: conditioning, information pathways, and modeling/vicarious learning.[12] Due to space constraints only modeling and vicarious learning will be discussed.

Social Learning Theory

Albert Bandura developed the social learning theory in the late 1960's. Bandura's initial work with social learning addressed the development of aggression in children from the ages of 3-5 with the infamous BoBo doll modeling experiment. The social learning theory has been expanded to take into account how children acquire new fears and also addresses the flip side of helping children cope with their fears. The social learning theory holds that children can learn through observations of others or from vicarious experience through others. Essentially, the social learning theory believes an individual, or in this case a child, can learn from watching another person's experience of a situation. By observing the person's experience, that particular experience also becomes the child's. Bandura states, "Many intractable fears arise not from personally injurious experiences, but from seeing others respond fearfully toward or be hurt by threatening objects. Similarly, evaluations of places, persons, or things often originate from exposure to modeled attitudes."[1, p. 61] An example of dental anxiety in relation to the social learning theory would be a child watching another child patient tantrum during dental treatment. The social learning theory would state the very act of observing a negative reaction to dental treatment could cause the observing child to become fearful of dental treatment.

There is evidence to suggest observation and vicarious experience do influence dental anxiety. Ost and Hughdahl's study on dental phobia found 68% of their sample of dental phobics acquired their fear through conditioning, but more importantly they also found 12% of adult dental phobics can trace their dental fear back to a vicarious experience in their past.[13] Further research has also demonstrated the effects of social learning in the acquisition of dental anxiety in children. Townsend et al. found a modeling pathway was directly behind the conditioning pathway in their research on the development of dental anxiety.[14] Townsend et al. used self-report (Dental Anxiety Scale, State Anxiety Scale, Trait Anxiety Scale) and observation measures (Dyadic Prestessor Interaction Scale) to find mothers of anxious children were significantly more anxious than mothers of nonanxious children, suggesting children are vicariously developing anxiety through their parents modeling of anxiety.[14] Other research has also found evidence to support children's dental anxiety may be linked to a parent's dental fear.[15] The modeling and vicarious learning theory seems more applicable for children that exhibit dental fear on their first visit to the dentist. Children naive to the dental office cannot be conditioned to fear a stimulus they have not encountered. Learning to fear dental treatment through observation and vicarious learning seems more salient.

Not only does the social learning theory help explain the prevalence of dental anxiety; it can also be helpful in reducing dental anxiety in children. Currently, dentists use a variety of techniques like the tell-show-do technique, voice control, hand-over–mouth (HOM), and nitrous oxide to help control disruptive behaviors in children. For some children these techniques can be very helpful; however, improper usage, or in cases of diagnosable dental anxiety, these treatments can be ineffective and detrimental to children.

Dentists have been taught to be firmer, use louder voices, and restraint techniques such as voice control or HOM if necessary to control disruptive behavior in children. These methods may work in the short-term, but the child in the long run may have an increase of anxiety, aggression, or avoidance of the dentist.[4] The use of voice control and HOM techniques are considered useful and effective forms of controlling disruptive behavior by the American Academy of Pediatric Dentistry[23], but these techniques have a high potential to be used improperly or to be perceived by the child as a punishing situation. HOM in particular is considered a last resort technique that should be considered fully before use.[24] Research indicates punishing actions towards the child may condition the child to become even more fearful of the dentist.[4] The use of nitrous oxide is widely used for young children that exhibit disruptive behaviors during dental treatment. Research on the use of nitrous oxide suggests, once again, the use of this gas with children in a stressful situation may cause the child to become even more disruptive during future administrations of nitrous oxide.16 If the social learning theory is used in the form of a preventative technique, the frequency of use of other techniques such as HOM and voice control would be reduced and the potential conditioning of further dental anxiety also reduced.

How Does the Social Learning Theory Work?
The social learning theory works through five different elements: self-efficacy, performance accomplishment, vicarious experiences, verbal persuasion, and emotional arousal.[1]

Self-efficacy is the over arching concept in the social learning theory. The goal of the social learning theory is to build self-efficacy or to build an individual's perception of capabilities for performance.[17] Bandura states, "Perceived self-efficacy not only reduces anticipatory fear and inhibitions but, through expectations of eventual success, it affects coping efforts once they are initiated".[1, p. 80]

The building of self-efficacy takes place through performance accomplishment, vicarious experiences, verbal persuasion, and emotional arousal. Performance accomplishments are considered to be the strongest source of self-efficacy. Successful personal experiences raise a person's

expectation of future success; repeated personal success leads to the development of strong self-efficacy.[1] Vicarious experiences builds self-efficacy by "seeing others perform threatening activities without adverse consequences can create expectations in observers they too will eventually succeed if they intensify and persist in their efforts."[1, p.81]

Verbal persuasion is thought to be the weakest of the four possibilities in developing long lasting self-efficacy. Verbal persuasion consists of individuals being led, through persuasive suggestion, into believing they can cope successfully with what has overwhelmed them in the past.[1] Emotional arousal is pertinent to self-efficacy in perceived threatening situations. Due to the fact high arousal typically lowers performance success, individuals are more likely to expect success when they are not feeling highly aroused or not feeling the physical or emotion sensations connected with anxiety or fear.[1]

Application of Social Learning Model to Children with Dental Anxiety
If a dentist waits until the dental appointment to address a child's dental anxiety, in relation to the social learning theory, it is too late to reduce the fears of the child. The majority of the application that can be done with the social learning theory for dental anxiety must be done on a preventative level. The child should encounter aspects of the social learning theory before the first dental treatment or restorative appointment. The preventative interventions can take the form of film or in-vivo modeling and participant modeling. The social learning theory was founded on children ranging in age from 3-5 years of age; however, research pertaining to the influence of the social learning theory to decrease anxiety has been limited to childrenranging from the ages of 4-9. The dental practitioner will find the application of the social learning theory should be effective with children ranging from 4-9 years and only potentially effective for children younger than 4 years of age.

Filmed/In-vivo Modeling
Filmed/in-vivo modeling requires the child to watch another person (model) either on film or in-vivo (real life) going through, in this particular situation, dental treatment. During a session of filmed or in-vivo modeling a child would watch the model

move through the steps of the dental appointment demonstrating two key components of the social learning theory: vicarious learning and performance accomplishment. The child would be able to vicariously observe the model demonstrate positive coping skills such as deep breathing, relaxation, or imagery during the dental situation. The child, according to the social learning theory, would learn the coping skills and adapt the skills into their own behaviors during dental treatment. This would teach the child alternatives to cope with their anxiety, other than refusal or tantrum. An extremely important component of film/in-vivo modeling is performance accomplishment. The child must see the model successfully accomplish the dental treatment, due to the model's use of the positive coping skills. Success can be completing the dental treatment or a form of positive reinforcement.

Film/in-vivo modeling has been found to be an effective treatment of phobias. Ollendick and King, taking into account guidelines developed by the American Psychological Association's Division 12 known as the Chambless criteria for empirically supported treatments, found live and filmed modeling to be probably efficacious in the treatment of phobia.[18] Powers, also using the Chambless criteria to determine empirically supported treatments, found 13 treatments to be empirically supported treatments for pediatric procedure related pain. Out of those 13 treatments, 5 of the treatments incorporated filmed/in-vivo modeling.[19] In another study, children between the ages of 5-11 years old who had not been to the dentist before were shown a 13 minute film of a 4-year-old boy coping with a typical dental visit.

The children that watched the film of the young boy coping with the dental visit had significantly lower scores on the Behavioral Profile Rating Scale (BPRS), an observation measure, when compared to the control group that watched a film not related to modeling.[7] Studies focused on live modeling using observation measures have found that when children observe dental appointments of other children immediately scheduled before them, the children that observed have significant reductions in disruptive behavior.[20,21] Williams et al. also found that children being observed by others also had a significant decrease in their disruptive behavior.[21]

Participant Modeling
Participant modeling involves active participation from the observer. Typically, the observer is asked to watch a model similar to that found in filmed or in-vivo modeling. In addition, the child is asked to practice or engage in the skills the model is demonstrating during the modeling. The use of performance accomplishment and vicarious experience are just as important for participant modeling as in film/in-vivo modeling. The child must see the model be successful in their experience of coping skills and in dental treatment.

Participant modeling has been found to be a well-established treatment for phobias. Ollendick and King have found participant modeling to be more effective than both film/in-vivo modeling and the classical conditioning treatment of systematic desensitization in the treatment of phobias.[18] Further evidence supports the superiority of participant modeling. Klingman et al. divided children into two groups: a participant modeling group and film-modeling group. The

participation group was asked to participate with the model in techniques of deep breathing and imagery. Klingman et al. found the participant modeling group were more cooperative and less anxious and seemed to have obtained more information from the model, in comparison to the film-modeling group. Requesting a child simply participate with the model appears to have significant increase in the effectiveness of the modeling intervention.

There are several ways to increase the effectiveness of modeling, in general whether it be filmed or participant. Characteristics of the model itself can interfere with the effectiveness of the intervention. A "good" model must be similar to the observer. Models for dentally anxious children should be a child of similar demographic characteristics.[1] The model can also be very effective if the observer looks up to the model or holds the model in high regard.[1] A good example of a highly regarded child model would be any of the current popular cartoon characters, such as Sponge Bob or Barney like characters.

Modeling effectiveness can also be increased by using a "coping" model. For dentally anxious children it has been found "coping" models are more effective than "mastery" models. A coping model would express their fears and difficulty with the modeling situation, whereas the mastery model would show "mastery" over the modeling situation. "Coping models typically present complex behaviors in small steps as they overcome difficulties similar to those to be experienced by the observer."[21, p. 75] The mastery model would not express or show any fear or difficulty with the modeling

situation. Klorman et al. found evidence using the BPRS to suggest coping vs. mastery models does not seem to influence modeling for children that have had previous visits to the dentist. However, for children on their first visit to the dentist who had watched coping models, Klorman reported a significant decrease in uncooperative behavior and the children were less disruptive than those that watched the mastery model and compared to the control group.[22] Lastly, the child must have a sense of performance accomplishment. The child should be reinforced during treatment for exhibiting positive coping skills and after treatment for a job well done. The child will then feel successful and efficacious about dental treatment.

Conclusion
A child's first visit to a dentist is a pivotal moment in the reduction or expansion of dental anxiety. With the high prevalence of dental anxiety in children and the public health problem it poses, a preventative approach could benefit both child and the field of dentistry. The social learning theory offers not only a preventative approach but also easy and effective interventions that can be used with children, in particular ranging from 4-9 years of age. A dentist can act on his own free will to reduce disruptions in his office by incorporating either films or live observations within his or her practice. The dentist can further reduce disruptions in his office by simply asking the child to practice with the model. The collaboration between psychology and dentistry offers both fields a better understanding of dental anxiety and further improves the resources available to those children that suffer with dental anxiety.

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