

Time-out: an evaluation of a behavior management technique

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Abstract

This research evaluated a behavior modification technique known as "time-out". The technique as conducted in this research involves placing a disruptive child in a chair, facing a corner of the room for three minutes or less, with release from time-out being contingent upon the cessation of the disruptive behavior. Eighty-three preschool children, ages 3-5 were seen for an examination, prophylaxis, fluoride treatment, and bitewing radiographs in one dental visit. Only 12 of the 83 children required time-out. This behavior modification technique was successful with 7 of the 12 children. The other 5 children required additional behavior management techniques. Time-out should be considered an additional approach to behavior management.

A significant minority of children display uncooperative, often disruptive behavior, in the dental office. The reasons for this behavior can be as varied as the displays of behavior themselves. They include fear of the unknown, fear of injury or pain, anxiety due to separation from parent, previous negative dental experiences, or inability to understand the situation.¹⁻⁵ The undesirable behavior can be a result of the child's or dentist's mood at the time and can depend on such things as previous happenings that day, time of day, past experiences, or a specific incident.³⁻⁶ Negative behavior can be seen at any dental visit. It can be observed in uncooperative children as well as previously cooperative children.³ In other words, a child's behavior can be variable and unpredictable.

Managing the uncooperative child and attempting to redirect his actions favorably should be one of the dentist's primary goals. Behavior modification only rarely should require such extreme measures as restraints or hand-over-mouth.⁷ Usually by using voice control, intercepting inappropriate behavior of the child, or giving short explanations, the problem can be corrected and the treatment completed. One behavior modification technique that has not been used extensively or reported in

the dental literature is "time-out". In the psychological literature time-out repeatedly has been shown to decrease undesirable behavior in normal as well as physically handicapped and mentally retarded patients.⁸⁻¹³ There are no age or IQ limitations specified in the literature for the use of the various time-out techniques. In a classroom situation a disruptive child is removed from the class and placed in a nonstimulating environment. The child is placed in a corner of the room, facing the wall, or in another room. In this way he receives no reinforcement of the unacceptable behavior from social interactions. The child is allowed to return to the classroom situation after a certain time interval or when he is ready to behave.¹⁴

Another application of time-out has been its use on disruptive "out-of-seat" behavior on school buses. This technique involved stopping the bus and turning the radio off until the desirable behavior was attained.^{15,16} In another form of time-out, mothers of disruptive children were instructed to collect all toys, turn off the television, and leave the room until the disruptive behavior ceased.¹⁷

Most uses of time-out involve one of the following: (1) the separation from interpersonal contact (placing the child in another room or in a corner);¹⁸ (2) the elimination of auditory or visual stimulation [music, television, attention];¹⁵ or (3) the elimination of apparatus [toys].¹⁷ There is no single set of operations which adequately can define time-out. There are any number of variations of the use of the technique. However, the essential feature is a period of time when positive reinforcement is not available.

Time-out can be termed contingent or noncontingent, depending on whether the child's release from time-out is dependent on his good behavior (contingent) or whether he is released after a specific time period (noncontingent). According to Hobbs and Forehand, contingent time-out yields better results because less disruptive behavior is seen during the time-out period and immediately prior to release from time-out (since the release is contingent on the child's good behavior).¹⁷ It also has been shown that short periods of time-out (one to five

minutes) are more effective than longer periods, and that lengthening the time-out does not necessarily increase its effectiveness.¹⁴

Time-out contingencies may involve a variety of components which include: (1) removal of positive reinforcers; (2) reinforcement of desirable behavior because the time-out period is determined only after inappropriate behavior is stopped; (3) isolation itself is unpleasant, and so a punishment contingency involving adverse events may be involved; and (4) operant extinction since inappropriate behavior no longer is being reinforced by social attention.¹⁹

The purpose of this study is the evaluation of time-out as a behavior modification technique to be used on the pediatric dental patient. Time-out is used in this study as a contingent isolation (or seclusion) of the child, following an instance of inappropriate or problem behavior. To our knowledge time-out has not been reported in the dental literature as a means of modifying undesirable behavior in the dental chair.

This technique is being investigated because it gives the potentially cooperative child a chance to calm down, while at the same time it is a relatively passive method of management which parents easily understand and accept.

Methods and Materials

Eighty-three black preschool children, 34-56 months old, from local Head Start programs were seen in the Postgraduate Pedodontic Clinic of the Medical College of Virginia, School of Dentistry. Only some of the children had previous dental experience. Preappointment letters with instructions for preparing the children for their appointments were sent to the Head Start teachers (i.e., telling them to go into as little detail as possible about the dental appointment and suggesting that the children ask the dentist any questions they might have). The purpose was to standardize the preparatory information the children received prior to the examination.

Each patient received a complete dental examination, prophylaxis, topical fluoride treatment and two bitewing radiographs by the same dentist. During the appointment the children's behavior was videotaped. The child's first disruptive incident was handled with a brief request for cooperation and the second incident of uncooperative behavior resulted in a contingent time-out (not to exceed three separate periods of three minutes). The child was removed from the dental chair and placed in a small chair in the corner of the room, facing the wall. He was told to sit facing the corner until he "calmed down, quit crying, and was ready to help". A timer was set for three minutes and the child was ignored. If the child attempted to get up, turn around, or talk he was told again to face the wall until he was ready to help. As soon as the child indicated he was ready to cooperate he was allowed to return to the dental chair. If, after three minutes, the

negative behavior had not ceased, the instructions were repeated and the timer was reset for a second three-minute period. This was repeated for three, three-minute intervals. If at the end of this time the disruptive behavior had not ceased, more conventional behavior techniques were attempted. Voice control, verbal reprimand, hand-over-mouth, and restraints were used (in the order listed) to complete treatment when necessary.

Attempts were made to standardize the entire procedure when possible. Warnings and explanations were standardized using the same phrases and words whenever feasible. The same dentist (wearing a white jacket) did all the examinations and followed a set appointment protocol. After the appointment was completed all children received a gift as a token of affection and were thanked for their assistance and help in the examinations.

After all 83 appointments were completed the tapes were reviewed by two judges (both pedodontists) and the Frankl behavior scale was used to evaluate behavior.²⁰ Each child was scored using the four-point scale shown in Table 1.

Table 1. Frankl Categories of Behavior

Rating 1. Definitely Negative	Refusal of treatment, crying forcefully, fearful, or any other overt evidence of extreme negativism
Rating 2. Negative	Reluctant to accept treatment, uncooperative, some evidence of negative attitude but not pronounced, i.e., sullen, withdrawn
Rating 3. Positive	Acceptance of treatment; at times cautious, willingness to comply with the dentist; at times with reservation, but patient follows the dentist's directions cooperatively
Rating 4. Definitely Positive	Good rapport with the dentist, interested in the dental procedures, laughing and enjoying the situation

The Behavior Rating Scale was used to rate the following phases of the appointment:

1. Entrance into the operatory
2. Examination with mirror and explorer
3. Rubber cup prophylaxis
4. Fluoride treatment (4-minute) using upper and lower fluoride trays
5. Bitewing radiographs (two)
6. Receipt of gift and exit from room.

The number of minutes and times that time-out had to be used were noted as well as the stage of treatment when it was used. The effect of previous experience, age, and sex on the children's behavior also was noted.

Results

Interrater Agreement

Using the following standard rating reliability formula,

the index of reliability between the two raters was 90.4%. The scores given to each child by the observers were within one behavior rating category of each other for all phases of treatment evaluated. When differences of one rating category were excluded, interrater reliability between the two raters was 100%.

$$\frac{\text{Number of agreements}}{\text{Number of observations}} \times 100\% = \text{inter-observer reliability}$$

Subject Behavior

Statistical evaluation was performed using the chi square cross-tabulation. Of the 83 children examined only 12 (14%), 8 females and 4 males, had disruptive behavior requiring the use of time-out. Disruptive behavior was determined to be the uncooperative behavior of the child

Table 2. Sex and Previous Dental Experience Versus Use and Success of Time-Out

	Previous Dental Experience (N = 32)	No Previous Dental Experience (N = 51)	Females (N = 43)	Males (N = 40)
Children who did not require time-out	29	42	35	36
Children who required time-out	3	9	8	4
Successful time-out	2	5	5	2
Unsuccessful time-out	1	4	3	2

Table 3. Phase of Treatment Versus Use and Success of Time-Out

Phase of Treatment	Children Requiring "Time-Out" (N = 12)	Time-Out Successful	Successful Alternative Treatment Used ^a
Entrance	5	2	HOM ^b Restraints
Examination	3	2	HOM ^b Restraints
Prophylaxis	2	2	—
Fluoride	1	0	HOM ^b
Radiographs	1	1	—
Exit	0	0	—

^a Voice modulation used on all patients

^b HOM = Hand-Over-Mouth

which prevented the continuation of treatment (Frankl category #1). The method was successful with 7 (58%) of the 12 children (5 females and 2 males). Successful versus unsuccessful time-out was determined by the ability of the operator to complete the appointment with ease and with no further acts of disruptive behavior. The other 5 children (42%) who did not respond to time-out, required additional behavior management methods. Time-out was successful with 2 out of the 3 children with prior dental experience (Table 2). In the group of 12 children who had behavior problems, the ages ranged from 34 to 56 months with 9 of the children being under 47 months of age.

When looking at phases of treatment during which behavior problems occurred, we found that five children were put into time-out upon entrance into the operatory, three during the examination, two during the prophylaxis, one during the fluoride treatment, one during the radiographs (none required time-out during the exit period, Table 3).

All the behavior problem children received Frankl ratings of "1" (definitely negative) before being placed into time-out. Upon cessation of the negative behavior and upon returning to the dental chair the behavior rating range varied from a score of "3" (six children) and "4" (one child) in the successful time-outs.

Discussion

Although trends are seen in the data, the number of behavior problem children was so small that only one of the observations, age and frequency of time-out used was statistically significant. Younger children had poorer behavior. As a result, this group received more time-out experiences ($p < .05$). Success or failure of time-out or the number of time-outs used was not related to the age of the child, previous dental experience, or sex. There was a trend toward more negative behavior upon entrance into the operatory than during any other stage of treatment.

The question arises as to why this technique is successful. If the child is in a threatening situation (i.e., the dental chair) it would seem that being taken out of the dental chair and being placed in another chair would put him in a less threatening situation. If this were the case it would follow that the child would prefer to stay in time-out rather than go back into the dental chair. None of the 12 children who were placed in time-out chose to remain in that situation. Even those children on whom time-out was unsuccessful didn't choose to remain in time-out. Rather, they chose to remain uncooperative in both situations. We hypothesize that from the child's point of view, the lack of interpersonal contact and social interaction (i.e., the child facing the corner of the room) is as threatening as the dental chair and dentist. Time-out may be effective in some cases because it does not allow "escape" from the situation. It maintains the child's at-

tention to the situation at hand because the "unknown" factors are not eliminated. These reasons may contribute to the 58% success rate with time-out.

Of the seven children who responded to time-out, one required three 3-minute time-outs, one required two 3-minute time-outs, and five required 3 minutes or less in time-out. According to this study it appears that if a time-out is to be successful as a behavior modification technique, its effectiveness will be highest during the first 3-minute period.

Of the five children requiring additional behavior techniques, all required voice modulation, all required hand-over-mouth, and two required restraints as well. Regardless of the method used, treatment was completed on all 83 children.

Conclusions

In this study time-out was successful in 58% of children rated as "definitely negative" behavior problems. In the proper setting (allowing for available office space and time) time-out should be considered as an early behavior management technique (i.e., after voice control but prior to hand-over-mouth or the use of restraints). This study showed a trend toward poorer behavior in younger children during entrance into the operatory and examination phase. Practically, if time-out is not successful within the first three-minute time period it probably will not be successful with additional time-out periods, and other behavior modification techniques should be attempted.

Because this has been the only study of this type done in the dental field, we are unsure on which age group time-out would be most appropriate. It is hoped that this study can be duplicated using children of varying ages to determine on which age group it is most effective.

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