Disruptive Behavior Across Dental Visits

**ABSTRACT**

The present study evaluated the efficacy of providing time-based breaks via an automated cuing device to children receiving restorative dental treatment. The study employed a multiple baseline research design across participants. Results demonstrated reductions in escape-related behaviors (i.e., crying, body movements) for all children and reduced the need for physical restraint. Finally, this study provided further support to the use of escape in the dental setting.

**INTRODUCTION**

- Nearly one in four children seen by dentists present with marked behavior management problems. Disruptive behaviors can expose the child to increased risk of harm.
- Numerious interventions have been established to expedite the treatment of disruptive children. However, both pharmacological (i.e., general anesthesia, sedation) and aversive behavioral interventions (i.e., physical restraint) are not considered as optimally acceptable to parents.
- Less aversive, more acceptable treatments have been used as an alternative to more intrusive procedures (i.e., voice control, distraction, modeling, Teli-Show-Do, and positive reinforcement). Criticisms of these techniques include recognizing the appropriate intervention for the situation, time, and effort to implement the protocols, and progress monitoring.
- Escape procedures may be a better option. These techniques are effective in reducing problem behaviors as well as providing a cost-effective procedure that requires minimal time to prepare and/or implement. Escape is predicated on the notion that disruptive behaviors are performed in order to avoid something aversive. Regular use of escape from aversives reduces the need to engage in disruptive behaviors.
- Noncontingent escape (NCE) allows for response-independent access to escape on a fixed-time schedule. This procedure aims to break the association between disruptive behavior and the availability of escape by providing escape arbitrarily (i.e., by a time schedule) rather than based on the child’s behavior.

**METHOD**

**Participant and Setting**

- Five children between the ages of 4 and 7 years were recruited for this investigation from the patient pool at the University of Nebraska Medical Center (UNMC) Pediatric Dental Clinic.
- To be eligible, the participant must have demonstrated “definitely negative” or “negative” levels of disruptive behavior as indicated by a “1” or “2” respectively on the Frankl Scale during previous dental treatment. Finally, the child must require at least 3 additional visits for restorative dental procedures.

**Apparatus**

- Data were collected using an interval recording coding form. During the Treatment condition, a MotivAider was attached to the dentist’s waistband to signal time-based breaks. This pager-sized device produces a pulsing vibration on a fixed-time schedule.

**Design and Procedure**

- **Design:** This investigation used a multiple baseline design across participants.
- **Baseline:** Procedures during baseline were those typically followed at the dental clinic.
  - Topical & local anesthetics
  - Mouth prop between the upper and lower teeth and removal of the tooth decay via a dental handpiece (i.e., drill). Placement of the dental restoration (e.g., filling, crown).
  - Following treatment, each patient received a prize (e.g., stickers, balls, toy jewelry).
- **Treatment:** The dentist was fitted with a MotivAider and instructed to follow standard dental procedures. Prior to the start of treatment, the dentist showed the subject the device and said, “Look at this page. It tells me when we are supposed to rest. Whenever it buzzes, we will stop and take a break.” Initially, the frequency of the breaks occurred often (e.g., 15-20 seconds) and was thinned to a terminal schedule of 60 seconds. Break length varied from 10 seconds. The schedule of noncontingent escape was thinned based on a downward trend of disruptive behavior.
- **Reliability:** Reliability observations were conducted on 29% of the observations. Interobserver reliability was determined by calculating the number of agreements between observers on the occurrence and nonoccurrence of disruptive behavior, dividing by the number of agreements plus disagreements, and multiplying by 100. Overall reliability for disruptive behavior was 91%.

**Treatment Intensity**

- To ensure the integrity of the independent variable, the project dentist’s use of the noncontingent escape contingency was recorded. Integrity of the noncontingent escape procedure was calculated for 55% of dental visits and was found to be 94%.

**Participants**

- Summary of Intervals Involving Restraints
  - **Visit 1**
    - Melissa: 11
    - Elaine: 4
    - George: 6
    - Tanya: 18
    - Kevin: 6
  - **Visit 2**
    - Melissa: 0
    - Elaine: 0
    - George: 5
    - Tanya: 7
    - Kevin: 2
  - **Visit 3**
    - Melissa: 0
    - Elaine: 0
    - George: 5
    - Tanya: 7
    - Kevin: 2
  - **Visit 4**
    - Melissa: 0
    - Elaine: 0
    - George: 5
    - Tanya: 7
    - Kevin: 2

**Summary of Disruptive Behaviors**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Visit 1</th>
<th>Visit 2</th>
<th>Visit 3</th>
<th>Visit 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melissa</td>
<td>78%</td>
<td>73%*</td>
<td>27%*</td>
<td>12%*</td>
</tr>
<tr>
<td>Elaine</td>
<td>53%</td>
<td>67%</td>
<td>22%*</td>
<td>23%*</td>
</tr>
<tr>
<td>George</td>
<td>44%</td>
<td>49%</td>
<td>61%</td>
<td>89%</td>
</tr>
<tr>
<td>Tanya</td>
<td>81%</td>
<td>57%*</td>
<td>35%*</td>
<td>-</td>
</tr>
<tr>
<td>Kevin</td>
<td>49%</td>
<td>45%</td>
<td>48%</td>
<td>35%*</td>
</tr>
</tbody>
</table>

*Noncontingent escape visits

**RESULTS AND DISCUSSION**

- **NCE procedure was associated with decreased disruptive behavior across dental visits for all children (22% overall decrease).**
- **Strengths**
  - Supports use of escape-based procedures in dental setting
  - Implemented with high integrity-no booster sessions for behavior change agents
  - Visits no longer with treatment
  - 1st study to use NCE in health care setting
  - 1st study to use NCE with typically-developing children
- **Limitations**
  - Unknown influence of dentist behaviors in combination with treatment
  - No systematized method to thin schedules
  - Time limits
  - Low number of participants limits generalization

**Future Studies**

- Increase magnitude of reinforcer
- Replicate with more children in dental setting as well as extend to other professions
- Work toward making interventions attractive and feasible for applied settings to implement

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