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THE EFFECTS OF THREE TREATMENT METHODS UPON THE COOPERATIVE BEHAVIOR OF CHILDREN DURING THE FIRST DENTAL VISIT.

The University of Nebraska - Lincoln, Ph.D., 1972
Psychology, clinical

THE EFFECTS OF THREE TREATMENT METHODS UPON THE COOPERATIVE BEHAVIOR OF CHILDREN DURING THE FIRST DENTAL VISIT

by

Rodney Oral Sawtell

A DISSERTATION

Presented to the Faculty of

The Graduate College in the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Doctor of Philosophy

Department of Educational Psychology and Measurements

Under the Supervision of Professor Howard Tempero

Lincoln, Nebraska

December, 1972

TITLE

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GRAD 52002 300 5-66(7)

ACKNOWLEDGMENTS

The author wishes to thank his advisor, Dr. Howard E. Tempero, for his contributions to the completion of the present study. His constructive counsel through all phases of the research has been greatly appreciated.

The author also expresses his appreciation to the members of his reading committee, Dr. Larry Braskamp and Dr. Roger Bruning, for their helpful counsel and reactions to the manuscript.

The author acknowledges his indebtedness to Dr. Rune Simeonsson for initiating the idea of the research; to Dr. John F. Simon, Jr., director of the Clinic of Pediatric Dentistry, the University of Nebraska Medical Center; to Dr. Ronald W. Higgins, operatory dentist; and to the clinic staff for providing their services.

To his wife, Twyla, the author owes a debt of gratitude for her patience and encouragement.

R.O.S.

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CHAPTER I

INTRODUCTION

Patient management is a recurrent problem in the practice of dentistry for children--pedodontics. Dental treatment is frequently perceived as a stressful experience, regardless of age. It seems reasonable to assume that the dental experience offers a major threat to the security of the novice dental patient, particularly if he is a child. Dental procedures are often painful and the child's image of the dentist is often a fearful one. Almost from infancy, the child learns from his parents, his brothers and sisters, and friends about the unpleasant things which he can expect when he goes to the dentist. With such encouragement, it is not unusual that the child may approach the first visit to the dentist with apprehension.

Because of the child's frequent fears toward dentistry, an important part of the dental treatment may include ways of helping the child overcome his fears and accept proper dental treatment. There seems to be little doubt that fear and anxiety associated with dental procedures are major causes of neglect of oral health and of negative or uncooperative behavior in the dental situation (Johnson & Baldwin, 1968). It appears that the child's first dental appointment is an extremely significant event. If the appointment provides a pleasant introduction to dentistry, a base on which to build a good dentist-patient relationship may be established. On the other hand, an emotionally traumatic first dental experience may seriously handicap this

relationship (Wright & Alpern, 1971).

Purpose of the Study

The purpose of the study was to analyze the effectiveness of three treatment methods in reducing the noncooperative behavior and increasing the cooperative behavior of children during their first dental examination. The three treatment methods selected were: desensitization, behavior modification, and vicarious symbolic modeling. The methods were selected because they were considered particularly effective and useable in the dental environment and because they have a degree of research support.

The dental research literature does not include studies which incorporate the three treatment methods in one study. A comparative study of the effectiveness of the methods appeared to be useful, not only due to the deficiencies in the present research studies, but also in order to possibly provide some practical suggestions to the pedodontic profession in the handling of the child patient.

Methodological deficiencies in earlier studies also point to the need for the study. Many of the recent dental research studies based their findings upon the use of the Frankl Rating Scale (Frankl, Shiere, & Shiere, 1967) as the primary measurement instrument. Though the scale may have had utility in providing the investigators with a global type of evaluation, the advantages appeared to be lost in the scale's highly subjective nature and in its failure to provide quantifiable, continuous data. An innovation in dental research in the area of management of child patient behavior was introduced by

the present study in the form of a measurement instrument which provided objective measurements in the form of frequency occurrence measures taken at ten-second intervals during the various dental procedures. The frequency of occurrence instrument provided the investigator with the possibility of observing and recording the patient's ongoing behavior in the process of the dental procedures in terms of the rate of occurrence of the behavior. Another advantage of the instrument was that it allowed the observers to record multiple behaviors during the same ten-second intervals. The combination of frequency of occurrence and multiple behaviors in the one instrument made possible a more complete analysis of the patient's responses during the various dental procedures than was possible by the rating scale method.

An inadequacy frequently found in many previous dental studies was the failure to operationally define the target behavior. Often such constructs as anxiety and fear were used without consistent agreement between the studies as to what was meant by the terms (Johnson & Baldwin, 1968; Sarason, 1960). The present study operationally defines the behavior it was attempting to modify. The behavior of the patients is not described in terms of constructs representing the inner states of the individuals, but set up criteria for defining cooperative behavior that were observable, measurable, and capable of being replicated by other experimenters (Chambers, 1970).

In order to provide comparability to earlier studies in the

dental research, the study incorporated some of their standard features, namely, a questionnaire of child variables, the Taylor Manifest Anxiety Scale, and the Frankl Rating Scale. The use of these instruments was for descriptive purposes and were not used as the major sources for data.

One of the purposes of the study was to examine the causes of behavior and not be limited to statements about relationships, as was the case in many of the correlational studies (Wright & Alpern, 1971). Consequently, attempts were made to design an experimental study which incorporated such features as strictly controlled conditions, randomization, and two control groups.

Limitations of the Study

It is not the purpose of the study to make broad applications and generalizations beyond the clinic populations investigated. Replications and varied research designs should be implemented with varied populations in private practice and in other clinic settings before gross generalizations from these data would be considered applicable. The fact that two extremes existed in the population, namely, lower socioeconomic families and higher socioeconomic families of the professional personnel who were employed or were students in the medical center, may have limited the generalization of the results to other types of populations outside of the center.

Two areas of questionable validity existed as a result of the design of the study: (a) What were the reactive effects of the

experimental arrangements upon the subjects? That is, was generalization possible to non-experimental settings? (b) What was the interaction effect of selection biases and the experimental variables? That is, was this a unique population. Did this population cause the treatments to be less or more effective?

Hypothesis

There is a significant difference among the effects of the five treatment methods: desensitization, behavior modification, vicarious symbolic modeling, placebo control, and control.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter consists of a selective review of literature concerning aspects of dental research related to the topic of the study and a selective review of the research and theoretical literature pertaining to the choice of the three treatment methods as effective means of modifying the behavior of children.

Management of Child Behavior in the Dental Environment

Many observations and opinions are found in the dental literature concerning the management of child behavior in the dental environment. The necessity for child management procedures was recognized by Raymond (1875) as early as the nineteenth century. He described children as timid during their first dental visit and suggested beginning with a simple procedure. His suggestion of the need to form a good opinion seems to be the first recognition of the psychological aspects of child management in the dental situation.

McElroy (1895) stated that the meaning of "dentistry for children" and "pain" were synonymous to the public. She recommended using truthfulness, kindness, firmness, and sincerity. She stated that although the operative dentistry may be perfect, the appointment is a failure when the child departs in tears. McElroy was the first to evaluate the success of a child's appointment on anything other than a technical basis.

Representative of many of the early writings in the field of pedodontic dentistry was the work of McBride (1930). His studies consisted of a series of observations and opinions taken from clinical practice, but having no experimental basis. McBride suggested that to be successful with children a mechanical approach must be avoided. He recommended a friendly and personal approach, but did not hesitate to recommend firmness when necessary. He was the first to classify behavior patterns of children in the dental situation and to suggest procedures to meet these problems.

More recent studies in the field of child management in the dental environment have focused attention upon the possible variables which may influence the behavior of the child in the dental setting. The rationale for such studies was that if the causes for the child's behavior could be located then, possibly, some type of prevention or preparation could be made by manipulating the variable for the advantage of the child and the dentist. Some of the more important variables that have been investigated and reported in the dental literature included the following: maternal anxiety (Johnson & Baldwin, 1968, 1969); presence of the mother in the operatory (Frankl, Shiere, & Fogels, 1967; Venham, 1972); appointment length (Lenchner, 1966); birth order (Defee & Himelstein, 1969); age (Klein, 1967); patient's perceived control over procedures (Corah, 1972); preappointment letters (Wright & Alpern, 1971); degree of patient's knowledge of his problem (Wright & Alpern, 1971); sibling support (Ghose, Giddon, Shiere, & Fogels, 1969); number and quality

of previous medical contacts, socioeconomic class, race, and sex (Wright et al., 1971).

Though many variables that may influence the behavior of the child in the dental environment have been investigated in the dental literature, all previous studies have been basically correlational and retrospective in nature and were based on data obtained from questionnaires and rating scales. An example of correlational, retrospective study in the area of variables that may influence the child's dental behavior was a study conducted by Wright and Alpern (1971). Wright et al. investigated the relationship of several antecedent variables as they related to the behavior of 64 children, ages 36-67 months during their first contact with a dentist. The first appointment was selected as a condition in the study since the initial dental contact had been emphasized as important in the literature and previous dental exposures would have introduced another variable (Offord, 1963; Olsen, 1965; Sharma & Brown, 1967). The purpose of the study was to develop an instrument that would predict the behavior of the child in the dental environment. The predictive variables were collected by means of a self-administered questionnaire completed by the mother during the child's first dental appointment. The child's behavior during the appointment was rated by the staff and then compared with the questionnaire ratings. The experimenters used such variables as whether or not the child believed he had a dental problem when he came to the dentist; a measure of the mother's anxiety; the quality and number of the child's past medical

experiences; the child's attitude toward physicians; and the socioeconomic status of the family. Several variables which were found to be significantly related to the children's cooperative behavior included the following: the mother's anxiety as measured by the Taylor Manifest Anxiety Scale; socioeconomic status; the child's attitude toward physicians; the quality of the child's past medical experiences; the child's awareness of his dental problem; and the mother's self-rate anxiety on the questionnaire.

While the Wright et al. (1971) study provided useful information about possible relationships between the variables and the child's behavior in the dental environment, the investigators were not able to make statements about the causation of behavior. In addition to the weaknesses inherent in the correlational method, the study was open to question due to its retrospective nature, i.e., attempting to go back in time to select antecedent variables that presumably account for present behavior. In such a retrospective study no control group was possible nor was it possible to manipulate controlled variables in order to measure significant effects upon behavior. The subjectivity and unreliability of questionnaires and rating scales, as the chief data collecting and measuring intruments, also cast doubt upon the validity of the study.

While correlational studies have been prominent in the dental research literature, several controlled experimental studies that pertain to the topic of the present study have been conducted recently. Adelson, Liebert, Poulos, and Herskovitz (1972) used a

modeling film for the purposes of reducing children's fear of dental treatment. Thirty children (fifteen above the age of seven and fifteen below), who were reported as fearful by their parents, were used as the subjects. One-third of the children in each group saw the film which the experimenters produced, "The Red Toothbrush"; one-third saw an American Dental Association film entitled, "The Child's First Visit"; and one-third served as untreated controls. Attitudes were measured using a rating technique. Among the younger children, more positive overall attitudes toward dentistry and a greater willingness to visit the dentist were obtained by those who saw "The Red Toothbrush" than by those in the control condition. There was no difference between the younger children who saw the ADA film and the controls. It was reported that agreement on whether improvement had occurred was perfect among three independent raters.

Machen and Johnson (1972) tested for possible effects of desensitization and model learning on the behavior of young children on three sequential dental appointments. Thirty-one subjects, with no previous dental experience and ranging in age from three to five years of age, were randomly assigned to either a desensitization, model learning or control group. Before their initial dental visit, the desensitization group received a twenty-minute therapy session in which they were presented objects associated with dentistry arranged in a hierarchy of anxiety production. The model learning group was shown an eleven-minute videotape of a child exhibiting positive behavior during a dental visit. The control group received no

instructions from the investigating team prior to the first visit. The dental appointments consisted of a clinical examination, a prophylaxis, and intraoral radiographs during the first visit. Preparation and placement of an amalgam restoration was completed during each of the second and third visits. The behavior of the children was rated independently by two previously trained observers. The results of the study showed that both therapy groups had significantly more positive behavior than the control group during visits two and three. No differences were observed for the first visit.

Johnson and Machen (1972) conducted a study to determine whether the introduction of behavior modification techniques to young children, prior to their initial dental visit, would alter the relationship between maternal anxiety and child behavior in the dental situation, as suggested by Johnson and Baldwin (1969). Fifty-eight children were randomly assigned to either a desensitization, model learning or control group. The desensitization group received a twenty-minute therapy session, while the model learning group viewed an eleven-minute videotape of a child exhibiting positive dental behavior. Each child had no previous dental experience and ranged in age from three to five years of age. A clinical examination, a prophylaxis, and intraoral radiographs were performed. Two independent observers, previously trained in rating behavioral activities, scored the reactions of the children during six aspects of their dental visit. The mothers of the patients

completed the Taylor Manifest Anxiety Scale and a brief preoperative questionnaire. The model learning group demonstrated no negative behaviors although 50 percent of the mothers were categorized as highly anxious. Similar results were found when behavior and the preoperative questionnaire were analyzed. The introduction of model learning appeared to favorably alter the previously established relationships between maternal anxiety, a preoperative questionnaire, and child behavior in the dental situation. The desensitization and the control group did not demonstrate the same effect.

Kohlenberg, Greenberg, Reymore, and Hass (1972) used behavior modification techniques with seventeen severely retarded residents of an institution for the mentally retarded consisting of seven females and ten males, ranging in age from eight to twenty years of age. The design of the experiment consisted of three phases: baseline, treatment, and posttreatment. During the first dental appointment, baseline (prebehavior modification) measures of dental chair behavior were obtained. Between the first and second sessions, nine subjects (the experimental group) were given two forty-five minute behavior modification sessions. The remaining eight subjects (control group) received no training. The behavior modification sessions were conducted in a dental office by psychology students attired in white dental coats. The experimental group was exposed to reinforcement, shaping, and fading procedures which were designed to produce "good dental chair behavior," as previously operationally defined in the study, i.e., sitting back in the chair, paying attention to the

dentist, and opening the mouth and holding it open even after the introduction of a dental instrument into the mouth. Reinforcers consisted of various fruit juices delivered directly into the mouth by squirting them through a rubber bulb. Other reinforcers included photograph cards of professional athletes. After the treatment sessions, all seventeen subjects, both experimental and control, were rescheduled for a second dental appointment during which measurements of dental chair behavior were once more obtained. Procedures were instituted to prevent the dentist and his staff from identifying a patient as either in the experimental or control group. The target behaviors of what constituted "good dental chair behavior" were operationally defined and measured. The behavioral measures were: the amount of time the mouth was open and the number of physical restraints necessary to maintain the patient in the proper position. The results showed significant increases in the behavior desired on the part of the experimental group.

Summary and Evaluation of the Dental Research

In the above review of the dental research there was noted a continuing interest in finding adequate management techniques for pedodontic practice, with a particular interest directed toward finding and applying psychological techniques for the solution of problems of child behavior in the dental environment. The literature included opinions, clinical observations, correlational studies, and, more recently, attempts to conduct controlled experimental studies.

Even in the better of the controlled studies, there was often several major experimental defects. Some of the studies omitted the randomization of the subjects into treatment groups, thus failing to equate the groups at the beginning of the study. Variables were often determined by the questionnaire method. Behavioral measures were mainly obtained from rating scales which often did not produce continuous data and, thus, reduced the sensitivity of the measurement desired. The constructs of anxiety and fear were not operationally defined and were often used in a confusing manner, taking on different meanings depending on the particular theoretical orientation of the researcher. Frequently the operational criteria were defined in terms of the Taylor Manifest Anxiety Scale (MAS), which has serious validity problems (Jessor & Hammond, 1957; Sarason, 1960).

Research and Theoretical Background for the Choice of the Three Treatment Methods

An evaluation of the dental and psychological research literature that pertains to the changing of children's behavior in the dental environment led to the choice of the three treatment methods used in the study. Various dental studies had used one or two of the methods, but no study, to date, has combined the three in one study. In the sections to follow, the research and theoretical background for the choice of the three treatment methods are presented.

Desensitization. The therapeutic properties of direct deconitioning (desensitization) were first demonstrated by Jones (1924).