DOCUMENT RESUME

ED 161 535 PS 010 181

AUTHOR Klorman, Rafael; And Others
TITLE Effects of Coping and Mastery Modeling on Experienced and Inexperienced Pedodontic Patients' Disruptiveness.
INSTITUTION Rochester Univ., N.Y. Coll. of Arts and Sciences.
PUB DATE [78]
NOTE 29p.; Study 1 of this report was presented at the meeting of the American Association for Dental Research (Las Vegas, Nevada, June 1977)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Adjustment (to Environment); Behavioral Science Research; Behavior Change; *Behavior Patterns; Behavior Rating Scales; *Change Strategies; *Dentistry; *Elementary School Students; *Modeling (Psychological); Observational Learning

ABSTRACT

This report examines the results of 3 studies on the effects of coping and mastery modeling on 106 pedodontic patients with and 30 patients without a prior filling or extraction. Before undergoing a filling, the 8-year-old subjects viewed a videotape depicting (a) a coping model receiving a filling; (b) a mastery model undergoing identical treatment; or (c) a child playing with an adult. A standardized interview indicated that subjects appropriately perceived the differences between coping and mastery models. Inexperienced patients who viewed either model were significantly less disruptive on the Behavior Profile Scale than inexperienced control subjects. Modeling did not affect experienced patients, who were significantly more cooperative than inexperienced patients. (Author/SE)

Effects of Coping and Mastery Modeling on Experienced and Inexperienced Pedodontic Patients' Disruptiveness

Rafael Klorman, Pamela L. Hilpert, Robin Michael,
University of Rochester

Christine L. G. Arata and Odd B. Sveen
Canandaigua V.A. Hospital Eastman Dental Center

Running Head: Coping vs. Mastery Modeling in Pedodontics

Abstract

This report comprises three studies on the effects of coping and mastery modeling on 106 pedodontic patients with and 30 patients without a prior filling or extraction. Before undergoing a filling, subjects viewed a videotape depicting (a) a coping model receiving a filling; (b) a mastery model undergoing identical treatment; or (c) a child playing with an adult. A standardized interview indicated that subjects appropriately perceived the differences between coping and mastery models. Inexperienced patients who viewed either model were significantly less disruptive on the Behavior Profile Scale than inexperienced control subjects. Modeling did not affect experienced patients, who were significantly more cooperative than inexperienced patients.

Effects of Coping and Mastery Modeling on Experienced and Inexperienced Pedodontic Patients' Disruptiveness

Social learning theory has generated extensive evidence of the reduction of fear by viewing a model that displays dauntless behavior toward potentially fear-inducing objects. This research has been conducted with both adults (e.g. Bandura & Barab, 1973; Bandura, Blanchard, & Ritter, 1969; Geer & Turteltaub, 1967; Meichenbaum, 1971) and children fearful of snakes and dogs (Bandura, Grusec, & Menlove, 1967; Bandura & Menlove, 1968). In recent years, there have been a number of successful applications of modeling principles in pedodontic patients' first treatment session (Hawes, Melamed, & Hutcherson, Note 1; Machen & Johnson, 1974; Melamed, Weinstein, Hawes, & Katin-Borland, 1975; Melamed, Hawes, Heiby, & Glick, 1975).

Notably, modeling interventions have proven effective also for patients who were previously extremely resistant to or fearful of dental treatment. There have been reports of successful modeling interventions with individual patients (Adelson & Goldfried, 1970; Gordon, Terdal, & Sterling, 1974) as well as controlled investigations employing adults (Shaw & Thoresen, 1974) and children (White, Akers, Green, & Yates, 1974).

This impressive array of successful demonstrations of modeling in the pedodontic setting encouraged the search for particularly effective approaches for reducing pedodontic patients' anxiety. The present research was focused on two modeling procedures delineated by Meichenbaum (1971). This theorist has defined a coping model as one who appears initially anxious in a phobic situation but who subsequently overcomes his fear and displays specific techniques for coping with anxiety. In contrast, a mastery model is one appearing dauntless and in control of the potentially fear-evoking situation

from the start. Coping models, whether live (Meichenbaum, 1971) or imaginal (Kazdin, 1974, a,b) have been shown to be more effective than their mastery counterparts in reducing adults' fear of snakes. Similar effectiveness of coping models has been achieved with test-anxious students (Sarason, 1975).

The present report consists of three studies aimed at evaluating the differential effectiveness of coping and mastery models for pedodontic patients.

STUDY 1

Method

Subjects

Subjects were 60 pedodontic patients from Eastman Dental Clinic who required a restorative amalgam, i.e. a filling. All these children received a rating of at least 2 on a five-point scale of fear of dentistry (1 = Not at all afraid; 5 = Very afraid) by their dentist or mother. The majority of the subjects (59/60) had received prior dental treatment, and none was afflicted with psychosis, retardation, or crippling physical impairment.

Three experimental groups of 20 subjects each were formed randomly with the restriction of approximate balance of age as well as race and sex distribution. As shown in Table 1, these groups, which were assigned to view one of three types of videotpaed models, were comparable on sex makeup, $\chi^2(2) = 1.76$, n.s.; racial composition, $\chi^2(2) < 1$, n.s.; mothers', $F(2,57) < 1$, n.s., and dentists' rating of fear of dentistry, $F(2,57) < 1$, n.s.; and age $F(2,57) < 1$, n.s.

Insert Table 1 about here

Procedure

After arrival at the clinic, each child was shown one of three 10-min.

black-and-white videotapes of the same eight-year-old Caucasian boy interacting with an adult.[1] In two of these tapes, this model underwent a restorative procedure. A male dentist and female dental assistant acted friendly and sympathetic while introducing the child to the equipment. They described and performed the procedures involved in a filling: application of a topical, subcutaneous injection of an anesthetic, insertion of a rubber dam, drilling, and amalgam restoration.

The two tapes were identical except for the model's behavior. In the mastery tape, the boy seemed interested, appeared to enjoy finding out about treatment procedures, and was well-behaved throughout. In the coping tape, the model appeared initially fearful, hesitant to even enter the office. Gradually, he became less apprehensive, and by the end of the procedure he no longer appeared fearful. The control tape depicted the same child teaching an adult male a table hockey game.

After seeing the videotape, the subject was led to the operatory. Dental treatment was administered by one of five pedodontic residents in conjunction with a dental assistant. All practitioners followed a semi-standard procedure similar to that depicted in the mastery and coping tapes. The dentists were unaware of the specific tape seen by the child and treated a comparable number of children in each experimental group, $\chi^2(8) = 8.11$, n.s.

Throughout the dental treatment, two trained observers blind to videotape assignment were stationed behind a one-way mirror and, every three minutes, counted the frequency of the 24 anxious and uncooperative behaviors included in Melamed et al.'s (1975) Behavior Profile Rating Scale[2] through the completion of the first restoration. Each of the categories in this scale has a weight based on its disruptiveness, as rated by dental judges. The final score on

this measure consists of the sum of the weighted counts divided by the number of three-min periods.[3] In this study, the median agreement over behavior categories for the 12 pairs of 10 observers involved was 81%. The duration of the observed portion of treatment, as shown in Table 1, was comparable for all groups, $F(2,54) < 1$, n.s.

At the end of treatment, the dentist rated the child's nervousness in the session on a five point scale (1 = Not at all; 5 = Very much). Finally, before coping and mastery subjects left the clinic, they were asked two standard open-ended questions to check on their perception of the model's behavior: a) "How was the boy feeling at the beginning of the film?," and b) "How was he feeling at the end of the film?" Because this procedure was not instituted until the latter part of the study, and some subjects could not stay after the completion of treatment, these data were available for only 13 subjects.

Results

Subjects' Perception of the Model

The answers to the open-ended questions were sorted into categories by a judge blind to the respondents' group assignment. The majority of mastery subjects (6/8) viewed the model as "happy" at the beginning of the film, whereas all responding coping subjects (5/5) described him as "scared" ($p = .03$, Fisher's exact test). On the other hand, mastery and coping subjects were equally likely to describe the model's behavior at the end of the film as "better" (2/8 and 2/4, respectively) or "happy" (6/8 and 2/4, respectively). For the limited number of subjects assessed, then, this interview supported the success of the experimental manipulation.

Measures of Uncooperativeness and Anxiety

As shown in Table 2, attending dentists rated all three groups as comparably low in nervousness, $F(2,22) < 1$, n.s.

Behavior Profile Scale means and standard deviations also appear in Table 2. These scores were lowest for coping subjects, but differences between groups did not reach significance in an analysis of variance of the three groups' data, $F(2,54) < 1$, n.s., or in analysis of covariance, $F(2,53) = 1.25$, n.s., which adjusted statistically for younger children's tendency to obtain higher scores on the Behavior Profile Scale, $r(58) = -.28$, $p < .05$. However, the planned comparison of coping and control subjects' adjusted scores approached significance, $t(53) = 1.76$, two-tailed $p < .10$.

A subsidiary analysis indicated that the above results were typical for most children, regardless of the particular dentist to whom they were assigned for treatment.

Insert Table 2 about here

Discussion

The weakness of these results contrasted with the impressive and replicable effectiveness of previous reports (e.g. Melamed et al., 1975). In fact, even the coping group's mean score on the Behavior Profile was as high as the untreated control groups' in Melamed et al.'s work. There were two major probable reasons for these differences. Possibly, the present video-taped modeling procedures were not powerful enough to override these patients' previous pedodontic experience. Conceivably, the effectiveness of modeling would be enhanced by greater emphasis on the fundamental characteristics of the model, e.g. through flashbacks and by the demonstration of a specific coping technique. Alternatively, the effectiveness of modeling techniques might be limited to patients studied in their first exposure to pedodontic treatment, like those in Melamed et al.'s (1975) or Machen and Johnson's (1974)

investigations. Studies 2 and 3 were designed to examine the effectiveness of improved modeling videotapes on experienced and unexperienced pedodontic patients, respectively.

STUDY 2

Method

Subjects

Subjects were 46 patients from Eastman Dental Center who had previously received a restoration. They were selected and assigned to experimental videotapes by the same criteria as in Study 1, except that no restriction was placed on patients' rated fear of dental treatment. As shown in Table 1, the three samples did not differ in sex composition, $\chi^2(2) = 3.91$, n.s.; racial makeup, $\chi^2(2) < 1$, n.s.; fear of dentistry, as rated by the mother, $F(2,39) < 1$, n.s., or the dentist, $F(2,40) = 1.77$, n.s.; or age, $F(2,40) = 1.11$, n.s.

Procedure

The mastery and coping tapes were essentially identical to those employed in the preceding study, except for the addition of a simulated post-treatment interview at the end of the tape. In this flashback, the model was asked to review his feelings throughout the session. The mastery model indicated that he had experienced no fear or discomfort throughout treatment. The coping model stated that he had been afraid initially, but that he had found the procedure to be not at all bad. In addition, the model stated that, in an effort to control his anxiety, he had counted to 10 during the injection, insertion of the rubber dam, and drilling. The control tape depicted the same child playing a game of darts with an adult male. The same model as in Study 1

was employed for all three tapes.

After viewing the appropriate videotape, the subject was asked to rate (0 = Not at all; 1 = A little; 2 = A lot) how "happy" and how "scared" the child depicted in the film appeared at the beginning and at the end of the film.

Next, the subject underwent a semi-standard dental treatment comparable to that in Study 1. During this period, his anxious and uncooperative behaviors were scored on the Behavior Profile Scale by two trained observers blind to experimental group assignment and stationed behind a one-way mirror. The Behavior Profile Scale was modified by dropping selected categories that involved indirect inferences about the child's behavior. Also, the scale was scored for the entire session as well as up to the insertion of the rubber dam, because following this procedure, treatment sessions varied somewhat with regard to duration, number and location of fillings, and extent of drilling. Therefore, the measure based on the early part of the treatment insured that the observations were conducted over a period of comparable duration and nearly identical dental procedures for all children.[4]

Two judges who jointly observed 74% of the sample achieved reliability coefficients of .94 and .83 on the total unweighted and weighted scores respectively. The comparable coefficients for data collected through insertion of the rubber dam were both .95.

At the conclusion of treatment, ratings of cooperativeness were sought again from the attending dentist, who was unaware of videotape assignment. These judgments were recorded on Frankl, Shiere, and Fogels' (1962) four-point scale (1 = Definitely negative; 4 = Definitely positive), and definitions

for each point on the scale were provided to the dental judges.

Results

Post-Videotape Interview

Figure 1 depicts the mean answer to each question for each experimental group.[5] Analysis of variance disclosed that the three samples differed in their perception of the model's happiness at the beginning and end of the videotaped episode, Groups x Points $F(2,38) = 4.77$, $p < .02$). Two-tailed t-tests indicated that, as hypothesized, only coping subjects perceived the model as significantly happier at the end than at the beginning of the episode, $t(38) = 4.46$, $p < .01$. Similarly, groups differed in their ratings of the model's fearfulness (Groups x Points $F(2,37) = 3.50$, $p < .04$). As hypothesized, coping subjects rated the model as significantly less scared at the end of the episode, $t(37) = 4.69$, $p < .01$, while mastery subjects failed to report a change in the model's fear during the videotaped episode, $t(37) = 1.25$, n.s. The control group also rated the model as less scared at the end of the tape, $t(37) = 3.50$, $p < .01$, perhaps because they assumed that the model was less afraid after a protracted interaction with an adult. On the whole, then, the results indicate that the videotapes accurately conveyed to the child the intended experience of the model.

Insert Figure 1 about here

Measures of Behavioral Disruptiveness

Table 2 lists each group's mean and standard deviation on the Behavior Profile Scale and the dentist's post-treatment ratings. There were no overall differences between groups on scores based on the period ending with insertion of the rubber dam, $F(2,31) < 1$, n.s., or for the entire session,

$F(2,39) = 1.06$, n.s. Similarly, dentists rated all groups as highly cooperative and did not discriminate among them, $F(2,39) < 1$, n.s.[6]

Subsidiary analyses of these measures failed to disclose differences between experimental groups when considering the subject's sex or his placement above or below the sample's median age. Similarly, no differences between groups were apparent when the above analyses were restricted to subjects who underwent more presumptive stress or painful treatment.[7] In addition, as shown in Table 1, the three groups did not differ in the duration of the treatment session, $F(2,40) < 1$, n.s. Also, although not documented in the table, the three samples were comparable with regard to the number of restorations performed during treatment, $F(2,39) = 2.59$, n.s.; dentist assignment, $\chi^2(20) = 19.84$, n.s; and the proportion of subjects undergoing a filling in the lower mandible, $\chi^2(2) = 2.59$, n.s., or a pulpotomy, $\chi^2(2) = 1.72$, n.s. (See Footnote 7). Consequently, it may be concluded that there were no apparent artifacts or confounding factors that account for the lack of modeling effects in the present study.

Discussion

In this study, great care was taken to strengthen the credibility and efficacy of the modeling procedures. These efforts were successful, insofar as the subjects in each group correctly detected the intended differences among the coping and mastery models. Nevertheless, there were no differences among the experimental groups. Thus, even the borderline findings of Study 1 were not replicated. Taken together, the two studies suggested that the previously reported efficacy of modeling in a pedodontic setting might be limited to patients without prior dental experience. This possibility was examined in Study 3.

STUDY 3

Method

Subjects and Procedure

Subjects were 30 pedodontic patients from Eastman Dental Center selected by the same criteria as in Study 2, except that they had never before undergone a dental restoration or an extraction..

The procedures of Study 2 were followed as closely as possible, and 10 children were assigned to view each of the three tapes. As shown in Table 1, the three samples were comparable in sex composition, $\chi^2(2) = 1.90$, n.s.; racial makeup, $\chi^2(2) < 1$, n.s.; fear of dentistry as rated by mothers, $F(2,27) < 1$, n.s., or dentists, $F(2,27) < 1$, n.s.; age, $F(2,27) < 1$, n.s.; and session length, $F(2,27) < 1$, n.s. The samples were also comparable in number of restorations performed during the treatment session, $F(2,27) < 1$, n.s., proportion of patients undergoing a pulpotomy, $\chi^2(2) < 1$, n.s., or drilling in the lower mandible, $\chi^2(2) = 2.40$, n.s.

Results

Post Videotape Interview

As shown in Figure 1, the subjects' responses to the post-videotape interview were very similar to those obtained in the preceding investigation. Analysis of variance disclosed that ratings of the model's change in fearfulness across the episode varied among groups, Groups x Points $F(2,27) = 4.42$, $p < .03$. Unlike mastery, $t(27) = 1.22$, n.s., and control subjects, $t(27) < 1$, n.s., the coping group perceived a significant drop in the model's fearfulness over the simulated dental session, $t(27) = 4.10$, $p < .001$. Although perception of the model's happiness over the videotaped segment did not vary significantly between groups, $F(2,27) = 1.97$, n.s., there was statistical confirmation for

the prediction that coping subjects would rate the model as happier at the end than at the beginning of the episode, $t(27) = 2.44$, $p < .05$. Once again, then, the experimental manipulations were successful in presenting the coping model as initially fearful and unhappy and the mastery model as happy and fearless throughout.

Measures of Behavioral Disruptiveness

Figure 2 displays each group's mean score on the Behavior Profile Scale for the entire session. Scores based on the period ending with insertion of the rubber dam are summarized in Table 2. As shown in that table, both sets of data were characterized by a correlation between means and variances, so a square root transformation ($\sqrt{X + 1}$) was employed for all statistical analyses. Analysis of variance disclosed that the three groups differed significantly in disruptiveness for the entire session, $F(2,27) = 5.71$, $p < .009$, as well as for the early part of treatment, $F(2,26) = 4.36$, $p < .03$. As suggested in Figure 2, the two modeling groups were nearly identical in disruptiveness, whether assessed over the entire session, $t(27) < 1$, n.s., or over the early part of treatment, $t(26) < 1$, n.s. On the other hand, the coping and mastery group displayed significantly lower disruptiveness than the control sample over the entire session, both $t(27) = 3.10$, $p < .01$, and for the period culminating with insertion of the rubber dam, $t(26) = 2.74$, 2.50, respectively, $p < .02$. A similar, but nonsignificant trend characterized dentists' post-treatment ratings of cooperativeness, $F(2,27) = 1.06$, n.s., which are summarized in Table 3. As in the previous two studies, dentists described their patients as lying almost at the positive pole of this rating scale.

Insert Figure 2 about here

Subsidiary analyses demonstrated that differences between the modeling and control groups were not secondary to the patients' sex. In addition, inspection of the data indicated that these effects were present regardless of the dentist administering treatment.

Comparison of Experienced and Inexperienced Patients

Comparisons between the samples tested in Studies 2 and 3 seemed instructive in searching for explanations for the differential effectiveness of modeling as a function of prior experience with restorative treatment. Analysis of variance failed to detect significant differences in chronological age, $F(1,70) < 1$, n.s., and dentists', $F(1,70) < 1$, n.s., or mothers' pre-treatment ratings of the child's fear of dentistry, $F(1,69) = 1.54$, n.s.

In turn, as would be expected, a comparison of the two samples' square-root transformed Behavior Profile Scores showed that not only was modeling more effective for inexperienced subjects, Groups x Experience $F(2,69) = 4.17$, $p < .02$, but inexperienced patients were significantly more disruptive overall, $F(1,69) = 44.66$, $p < .001$.[8]

On the other hand, dentists' post-treatment ratings of cooperativeness did not differ as a function of patients' experience, $F(1,69) < 1$, n.s. Possibly, the Behavior Profile Scale measures different behaviors than those considered by the dentists' in their judgments. Alternatively, pedodontic residents may have used mostly high ratings of cooperativeness, in part, because they perceived themselves as being evaluated by the observers and experimenters.

Discussion

The results of this series of studies indicates that peer modeling has minimal effects on experienced pedodontic patients' disruptiveness during

treatment. In contrast, after exposure to a peer model, children undergoing their first restorative treatment displayed considerably less uncooperative behavior than controls. Presumably, the latter effects are due to exposure to a model rather than the mere demonstration of the impending treatment. Notably, a recent report (Melamed, Yurcheson, Fleece, Hutcherson, & Hawes, 1978) has documented the superiority in a pedodontic setting of a peer modeling videotape over one that merely provided information about treatment. Thus, the present research replicated previous reports (Melamed et al., 1975; Machen & Johnson, 1974) that peer modeling reduced pedodontic patients' disruptiveness in their initial treatment session.

The imperviousness of experienced patients in Studies 1 and 2 to these procedures probably relates to the brevity of this intervention and the relatively low levels of disruptiveness characterizing the experienced patients. In fact, previous successful applications of modeling to children's fears (e.g. Bandura & Menlove, 1968; White et al., 1974), have focused on highly fearful subjects and utilized more than a single exposure to a model. Thus, in conjunction with other recent reports (Klorman, Ratner, Arata, Sveen, & King, 1978; Melamed et al., 1978), the present research points to the importance of prior experience for understanding the pedodontic patient's behavior.

The differential effectiveness of coping and mastery models for reducing fear was not clearly established in this work. There has been little work with children on this issue. Kornhaber and Schroeder (1975) failed to detect differential reduction of children's avoidance of snakes after exposure to a fearful or a fearless model, both of whom demonstrated picking up a live snake. However, their fearful model differed somewhat from Meichenbaum's (1971)

definition of a coping model. Further apparent negative evidence on the differential effectiveness of coping over mastery models in reducing uncooperativeness among experienced pedodontic patients was reported by Melamed, Hawes, and Hutcherson (Note 2). As they wisely noted, their non-significant results may have been due to the low stressfulness of the dental examination upon which evaluation of the effectiveness of modeling procedures was based.

While the present results do not provide definitive documentation of the effectiveness of coping modeling for children, they represent initial evidence that some forms of this procedure are effective for reducing children's anxiety in dental treatment. This demonstration is important, because prior successful applications of modeling to children's fears have employed primarily mastery models. Future research should be addressed at clarifying the effective ingredients of coping models for children, e.g. the relative importance of the model's apparent decreased fear vs. his demonstration of a coping skill.

Reference Notes

1. Hawes, R.R., Melamed, B.G., & Hutcherson, S.T. Relationship between children's dental fears and the dentist's use of different reinforcement strategies. Paper presented at the meeting of the International Association for Dental Research, Miami Beach, Florida, March 1976.

2. Melamed, B.G., Hawes, R.R., & Hutcherson, S. Peer modeled fear behaviors during local anesthesia and its influence on children's dental examination behavior. Paper presented at a meeting of the International Association for Dental Research, Miami Beach, March 1976.

Adelson, R., & Goldfried, M.R. Modeling and the fearful child patient. Journal of Dentistry for Children, 1970, 37, 476-489.

Arata, C.L.G. The relative efficacy of coping and mastery models in reducing anxiety and uncooperativeness in pedodontic patients. Dissertation Abstracts International, 1977, 38, 2841-2842.

Bandura, A., & Barab, P.G. Processes governing disinhibitory effects through symbolic modeling. Journal of Abnormal Psychology, 1973, 82, 1-9.

Bandura, A., Blanchard, E.B., & Ritter, B. The relative efficacy of desensitization and modeling approaches for inducing behavioral, affective, and attitudinal changes. Journal of Personality and Social Psychology, 1969, 13, 173-199.

Bandura, A., Grusec, J.E., & Menlove, F.L. Vicarious extinction of avoidance behavior. Journal of Personality and Social Psychology, 1967, 5, 16-23.

Bandura, A., & Menlove, F.L. Factors determining vicarious extinction of avoidance behavior through symbolic modeling. Journal of Personality and Social Psychology, 1968, 8, 99-108.

Frankl, S.N., Shiere, F.R., & Fogels, H.R. Should the parent remain with the child in the dental operatory? Journal of Dentistry for Children, 1962, 29, 150-163.

Geer, J.H., & Turteltaub, A. Fear reduction following observation of a model. Journal of Personality and Social Psychology, 1967, 6, 327-331.

Gordon, D.A., Terdal, L., & Sterling, E. The use of modeling and desensitization in the treatment of a phobic child patient. Journal of Dentistry for Children, 1974, 41, 102-105.

Johnson, J.E., & Dabbs, J.M. Enumeration of active sweat glands: A simple physiological indicator of psychological changes. Nursing Research, 1967, 16, 273-276.

Kazdin, A.E. Covert modeling, model similarity, and reduction of avoidance behavior. Behavior Therapy, 1974, 5, 325-340. (a)

Kazdin, A.E. The effect of model identity and fear-relevant similarity on covert modeling. Behavior Therapy, 1974, 5, 624-635. (b)

Klorman, R., Ratner, J., Arata, C.L.G., King, J.B., & Sveen, D.B. Predicting the child's uncooperativeness in dental treatment from maternal trait, state, and dental anxiety. Journal of Dentistry for Children, 1978, 45, 62-67.

Kornhaber, R.C., & Schroeder, H.E. Importance of model similarity on extinction of avoidance behavior in children. Journal of Consulting and Clinical Psychology, 1975, 43, 601-607.

Machen, J.B., & Johnson, R. Desensitization, model learning, and the dental behavior of children. Journal of Dental Research, 1974, 53, 83-87.

Meichenbaum, D.H. Examination of model characteristics in reducing avoidance behavior. Journal of Personality and Social Psychology, 1971, 17, 298-307.

Meichenbaum, D. Cognitive behavior modification. New York: Plenum Press, 1977.

Melamed, B.G., Hawes, R.R., Helby, E., & Glick, J. Use of filmed modeling to reduce uncooperative behavior of children during dental treatment. Journal of Dental Research, 1975, 54, 797-801.

Melamed, B.G., Weinstein, D., Hawes, R., & Katin-Borland, M. Reduction of fear-related dental management problems with use of filmed modeling. Journal of the American Dental Association, 1975, 90, 822-826.

Melamed, B.G., Yurcheson, R., Fleece, L., Hutcherson, S., & Hawes, R. Effects of film modeling on the reduction of anxiety-related behaviors in individuals varying in level of previous experience in the stress situation. Journal of Consulting and Clinical Psychology, 1978, in press.

Sarason, I.G. Test anxiety and the self-disclosing coping model. Journal of Consulting and Clinical Psychology, 1975, 43, 148-153.

Shaw, D.W., & Thoresen, C.E. Effects of modeling and desensitization in reducing dentist phobia. Journal of Consulting Psychology, 1974, 21, 415-420.

White, W.C., Akers, J., Green, J., & Yates, D. Use of imitation in the treatment of dental phobia in early childhood: A preliminary report. Journal of Dentistry for Children, 1974, 41, 106-110.

Footnotes

This research was partly supported by a grant from the Roche Psychiatric Institute to the first author. The College of Arts and Science of the University of Rochester provided funds for computer time. C.L.G. Arata participated in Study 1, which is based on portions of a doctoral dissertation in Psychology at the University of Rochester (Arata, 1977). R. Michael participated in Study 2 and P.L. Hilpert in Study 3. Study 1 was presented at the meeting of the American Association for Dental Research, Las Vegas, June 1977.

We acknowledge the generous contributions to the research of Ralph Barocas, Michael Chandler, Richard DeFrank, Ellis Gesten, Daniel Kirschenbaum, Barbara Melamed, Lawrence Ota, and David Sieg, Jr. The staff of Eastman Dental Center was greatly helpful, especially Stephen Adair, Charles Brenner, Howard Bricker, and Ronald Kwasman. The research could not have been conducted without the invaluable participation of numerous devoted undergraduate observers, particularly Benjamin Dykman and Janice Krinsky.

Address requests for reprints to Rafael Klorman, Department of Psychology, River Campus Station, University of Rochester, Rochester, New York 14627.

1. Measures of autonomic arousal were obtained in all studies, but will not be reported in detail because they yielded no significant differences between experimental groups. In Study 1, the Palmar Sweat Index (Johnson & Dabbs, 1967) and radial pulse rate were measured upon arrival at the clinic, after viewing the appropriate videotape, and immediately after the injection of the anesthetic. In Studies 2 and 3, the electrocardiogram, skin conductance, and digital blood volume were monitored throughout dental treatment. Electrodes and transducers were attached after the post-videotape interview.

2. The items comprising this inventory and their weights are as follows: inappropriate mouth closing (1), choking (1), fidgeting (1), crying at injection (1), refusal to sit back (2), attempt to dislodge instruments (2), verbal complaints (2), questions regarding pain (2), white knuckles (2), negativism (2), closing of eyes (2), verbal message to terminate (3), refusal to open mouth (3), rigid posture (3), crying (3), dentist's use of loud voice (3), use of restraints (4), kicking (4), standing up (4), rolling over (4), flinging of arms (5), dislodging of instruments (5), refusal of dental chair (5), fainting (5), and leaving the dental chair (5). The definitions for these categories were graciously provided by Dr. Melamed.

3. Although this report is based on the weighted counts of the previously listed categories, statistical analyses of the unweighted rate of behavior counts indicate that the two sets of measures are highly correlated and yield nearly identical results.

4. The items dropped were questions regarding pain, negativism, and dentist's use of loud voice. Scores based on behavior through insertion of the rubber dam were available for 12 coping subjects, 11 mastery subjects, and 14 control subjects.

5. These data were available for 16 coping subjects, 14 mastery subjects, and 11 control subjects.

6. These data were available for 17 coping subjects, 14 mastery subjects, and 14 control subjects.

7. The factors considered for this purpose were (a) the experience of physiological monitoring; (b) a score of at least 2 on the mother's rating of fear of dentistry; (c) a score of at least 2 on the comparable rating by the dentist; (d) the experience during treatment of a filling in the lower

mandible, a procedure which is more painful than a restoration in the upper mandible; and (e) the experience of a pulpotomy, which requires more extensive drilling than a simple restoration.

8. As indicated in Table 1, duration of the session was somewhat shorter (2.5 three-min periods) for inexperienced patients. This difference was statistically significant, $F(1,69) = 5.36$, $p < .03$, but session length was nonsignificantly correlated with Behavior Profile scores among both experienced, $r(43) = -.01$, n.s., and inexperienced patients, $r(27) = -.05$, n.s. Thus, the difference in session length does not seem to relate to the greater disruptiveness of inexperienced patients.

Table 1

Background Variables for the Groups in each Study

Group	Sex[a]		Race[b]		Fear Rating: Mother		Fear Rating: Dentist		Age		Treatment Duration[c]	
	M	F	C	NC	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Study 1												
Coping	9	11	14	6	2.30	0.92	2.59	0.58	7.93	2.46	12.90	3.39
Mastery	12	8	14	6	2.25	0.55	2.42	0.51	8.61	2.41	12.40	4.18
Control	13	7	15	5	2.25	0.55	2.40	0.61	8.35	2.22	13.55	4.36
Study 2												
Coping	5	12	8	9	1.75	1.24	2.35	1.50	8.53	2.21	13.81	5.94
Mastery	6	9	8	7	1.60	0.63	2.00	0.93	7.97	1.90	14.80	4.04
Control	9	5	9	5	2.00	1.36	1.71	0.47	8.15	2.20	13.50	4.59
Study 3												
Coping	7	3	6	4	2.30	0.82	2.10	0.57	7.80	1.71	12.80	4.73
Mastery	6	4	5	5	1.90	0.99	1.90	0.99	8.26	2.24	10.80	3.49
Control	4	6	7	3	2.10	1.20	1.90	0.99	8.06	1.60	11.10	2.81

[a]M = Male; F = Female

[b]C = Caucasian; NC = Non Caucasian

[c]In three-min units

Table 2

Mean and Standard Deviation for Each Group and Study on Behavior Profile Score and Dentists' Ratings

	Behavior Profile Scale					
	Whole Session[a]		Early Treatment		Dentist's Ratings[b]	
Group	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Study 1						
Coping	7.90 (7.60)[c]	5.04	----	----	1.78	0.67
Mastery	10.09 (10.35)[c]	5.98	----	----	1.86	0.69
Control	10.68 (10.72)[c]	6.49	----	----	1.56	0.73
Study 2						
Coping	1.88	1.30	2.30	2.63	3.35	0.86
Mastery	1.33	1.24	1.97	2.54	3.64	0.50
Control	1.91	1.14	2.06	1.82	3.64	0.63
Study 3						
Coping	2.79	1.89	3.89	2.07	3.60	0.70
Mastery	3.38	2.98	4.48	3.73	3.50	0.85
Control	7.04	4.07	8.10	3.89	3.10	0.88

[a]In Study 1, these scores were obtained through completion of the first filling.

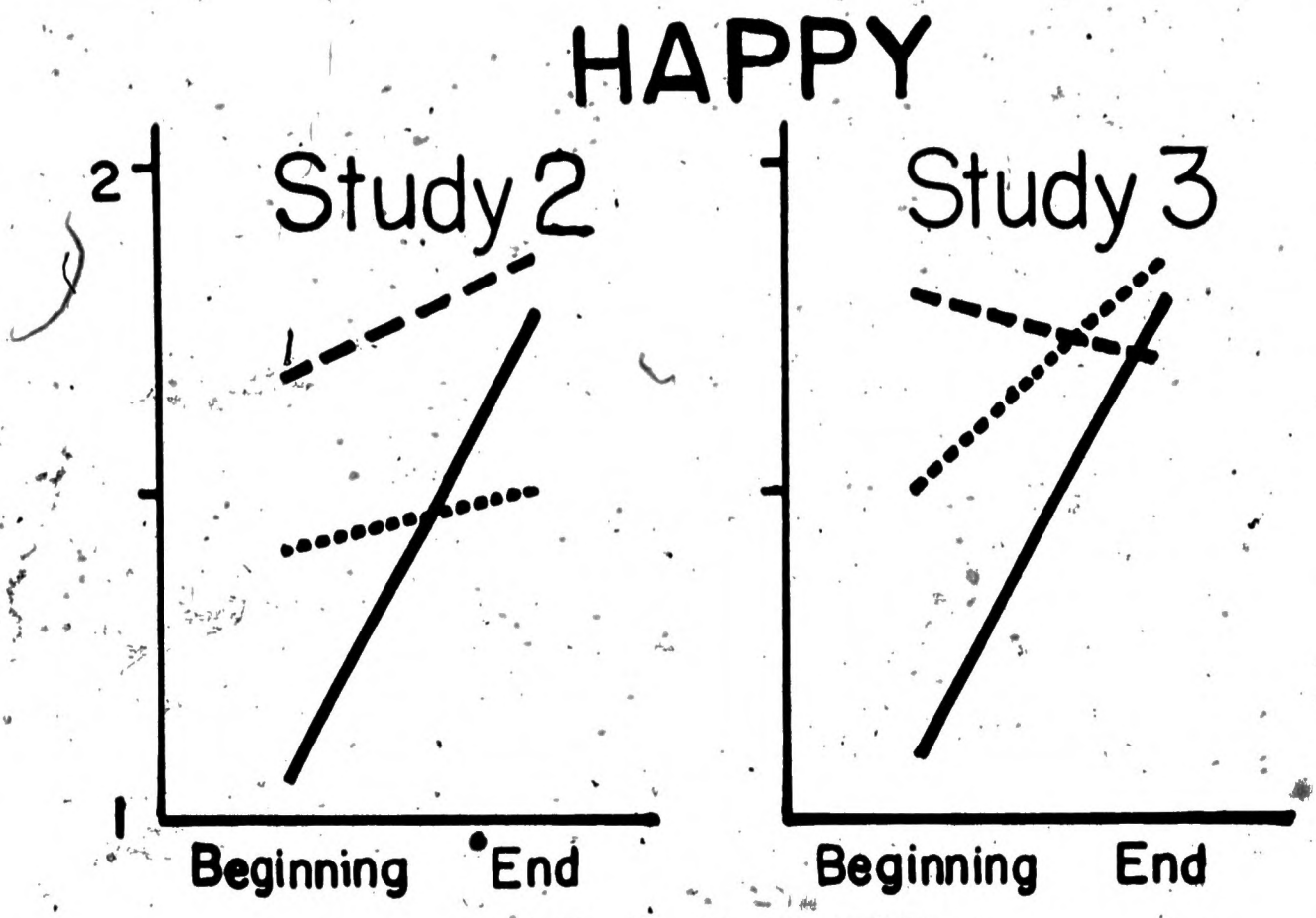
[b]Scores for Study 1 are based on a five-point scale; high scores denote nervousness. Scores from Studies 2 and 3 are based on a four-point scale; high scores denote cooperativeness.

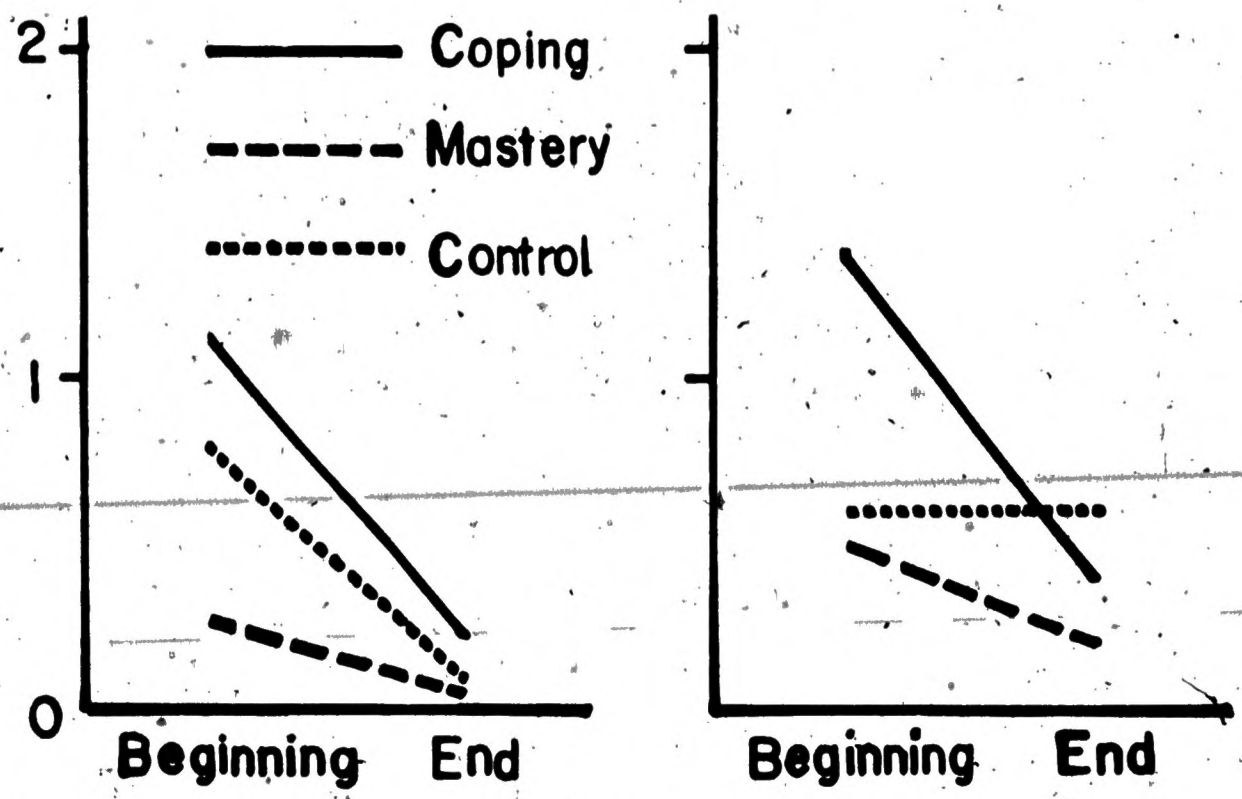
[c]Scores adjusted statistically for chronological age.

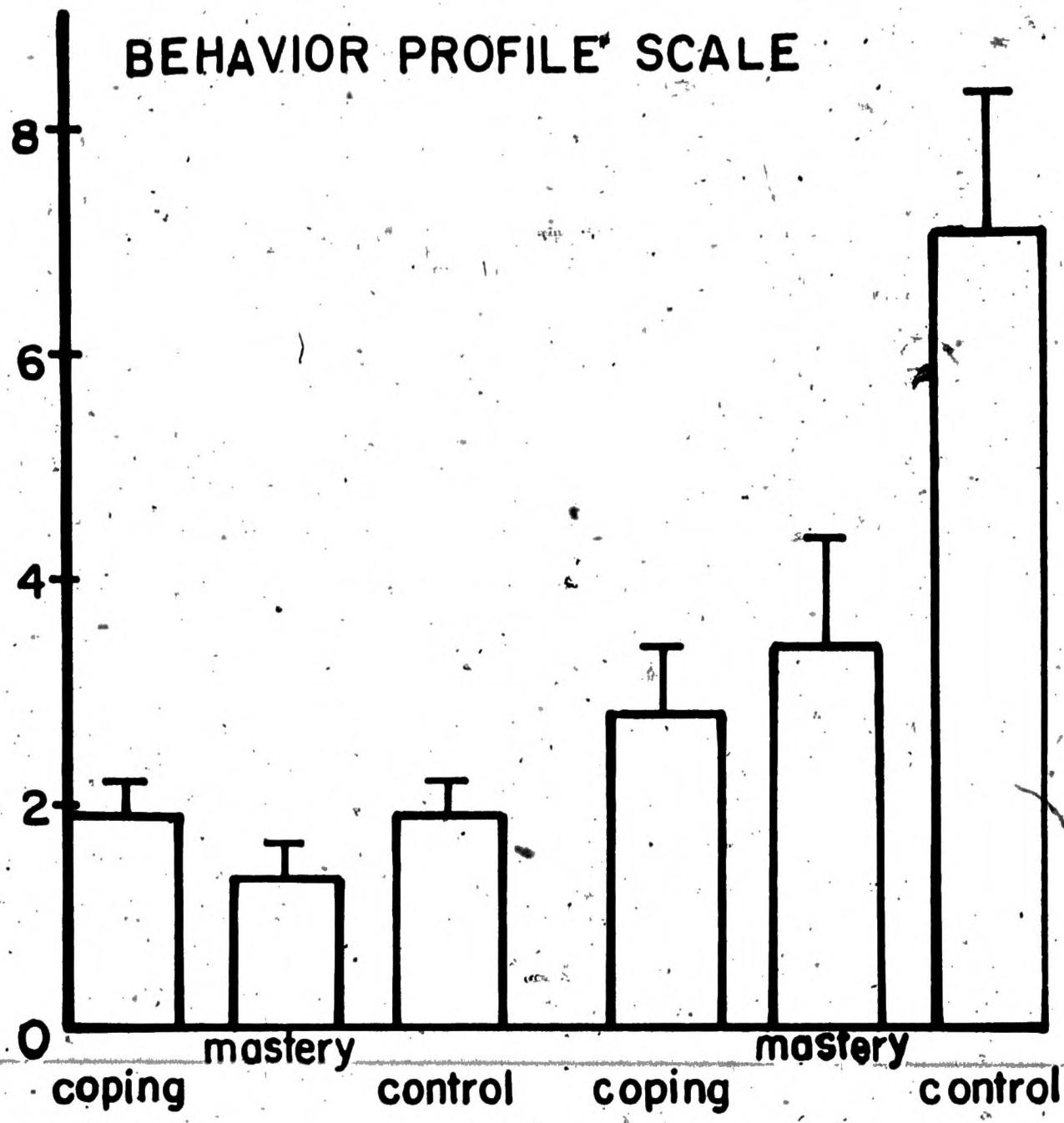
Figure Captions

Fig. 1. Mean ratings by experimental groups in Studies 2 and 3 of the model's happiness and fearfulness at the beginning and end of each videotaped episode.

Fig. 2. Mean scores on the Behavior Profile Scale for experimental groups in Study 2 (Experienced Patients) and Study 3 (Inexperienced Patients). Vertical bars represent standard errors of each mean.


HAPPY
Study 2
Study 3
2
1
Beginning
End
Beginning
End


SCARED
Coping
Mastery
Control
2
1
0
Beginning
End
Beginning
End


BEHAVIOR PROFILE SCALE
8
6
4
2
0
coping
mastery
control
coping
mastery
control
EXPERIENCED
INEXPERIENCED