PEDIATRIC DENTISTRY Copyright © 1983 by
The American Academy of Pedodontics Vol. 5 No. 2

Behavior of dental assistants managing young children in the operatory

Philip Weinstein, PhD T. Getz, MS
Peter Ratener, MS Peter Domoto, DDS

Abstract

This paper describes the behavior of 30 dental assistants over 72 appointments in the management of three- to five-year-old children. Guidance, empathy, verbalization, and physical contact were major provider categories; a dichotomous measure of fear-related behavior was derived from child categories. The distribution of duration and frequency of behaviors within each category indicate that the assistants did little child management. Lag sequential analyses calculated conditional probabilities for child behavior, given assistant behavior. These probabilities were compared to results when child fear-related behavior was lagged on dentist behavior. Results suggest relative effectiveness of a set of dental assistant behaviors. Patterns of dentist and assistant management behaviors also were explored.

The interaction between health care provider and patient is extremely important. Though difficult to assess, studies in medicine indicate patient behaviors, including satisfaction, appointment keeping, medication errors, and compliance with a wide variety of recommendations, are a function of clinician communication or management.[1,2]

Most studies of dental provider and patient interaction have focused on the dentist or dental student.[3-6] Few studies have examined the influence of auxiliaries on patient behavior or have ever described clinical auxiliary behavior *vis-a-vis* the patient. Weinstein[7] assessed the influence of hygiene student personality characteristics on patient anxiety levels over time, and Strack et al.[8] attempted to establish a relationship between hygienist empathy and patient compliance with home care recommendations. MacKenzie et al.[9], in the context of assessing the impact of a behavioral dental assistant-hygienist curriculum, summarized the self-reported behaviors of graduates. Materials exist that describe optimal auxiliary management of handicapped[10] and child patients.[11-13] However, the procedures discussed and recommended are basically the same procedures recommended for the dentist.

The role of the auxiliary in assisting the management of child patients as part of a team has not received much attention. Starkey[14] discussed office personnel training in child management. Though he wrote that each member of the team contributes to management of the child, he did not specify auxiliary management responsibilities beyond transfer of the child from reception room to operatory. As each dentist has a different philosophy and set of competencies, Starkey recommends in-office instruction and the importance of assigning specific assignments and roles to the auxiliary.

Though few dentists practice without auxiliaries, there has been little research in child management to provide direction to either formal auxiliary training programs or informal in-service education. This study, part of a larger study of child management in the operatory, attempts both to describe the behavior of a sample of assistants in child management and to begin to identify patterns of interaction between dentist and assistant in child management.

Methods and Materials

Subjects and Design

Subjects in this study were solicited by mail after selection of a random list of dentists from the files of the King County Dental Association and the Washington State Academy of Pediatric Dentists. Twenty-two general practitioners and three pedodontists allowed their assistants to participate. Fifty child patients of these dentists participated. Dentists identified three- to five-year-old children in their practice. These children then were screened by the dentist. At that time child behavior during prophylaxis was observed and dental health recorded.

Children eligible for participation in the study required injections during two or more sessions. In all, each dental team was to provide two or more treatment sessions to two children, a total of 100 appointments.

All participating dentists and assistants completed questionnaires regarding their confidence, experience, and expectations of child behavior at each session. Dentists also agreed not to use nitrous oxide or any other premedication. Aside from this prohibition, they were asked to treat the child as they ordinarily would. All sessions were videotaped. Eighty-seven usable videotapes from 20 offices (20 dentists and 30 auxiliaries) have been analyzed and provide the basis for the data presented in this paper. Figure 1 presents the coding scheme used in this study.

Coding Scheme

Behaviors are separated into major child and provider dimensions, categories that are mutually exclusive (only one behavior within each dimension can be scored at any time) and exhaustive (no time can pass without a codable behavior occurring). Reliabilities were adequate and have been published elsewhere (Weinstein, et al.[15]). To facilitate data analysis, child behaviors were grouped into fear and nonfear categories. The fear-related behavior

Figure 1. Coding schemes for provider and child.

Provider

A. *Verbalization*
1. Dental to child
2. Nondental to child (distraction)
3. Dental (to other than child)
4. Nondental (to other than child)
5. No vocalization (silence)

B. *Guidance*
1. Directs immediate behavior by command
2. Shows, demonstrates, orients/explains and responds to questions concerning the treatment or appointment
3. Sets rules and limits for future behavior (do's and don'ts)
4. Provides specific feedback concerning behavior — positive and negative
5. Provides nonspecific feedback concerning behavior — positive and negative
6. Finds fault with behavior angrily, threatens, acts gruffly to direct behavior or gain cooperation; criticizes
7. Tries to persuade (personal appeal), coaxes, pleads to direct behavior or gain confidence
8. Raises rhetorical questions (interest not in question but patient response)
9. No guidance

C. *Empathy*
1. Questions for feelings or pain, or acknowledges feeling or pain
2. Reassures — verbal/nonverbal
3. Ignores expressed feeling, or statement of pain (apparent, e.g., "ouch")
4. Denies statement or expression of feeling or pain
5. Humiliates, belittles, (other putdowns or name calling)
6. Provides signal mechanism to stop procedure or asks about child preference
7. None of the above

D. *Physical Contact*
1. Touches face or mouth as part of normal procedures
2. Touches, pats, strokes child or tickles
3. Holds child (child not moving or interfering with treatment)
4. Restrains child in any way — including placement of mouth props (child moving or interfering with treatment)
5. Assists child entering or leaving chair; or positioning
6. No physical contact

Child

A. *Movement and Physical Positioning*
1. Appropriate positioning
2. Child initiated appropriate child movement (e.g., reopen mouth without cue)
3. Dentist initiated appropriate child movement
4. Child initiated minor movement, positioning still appropriate
5. Child initiated minor movement, positioning no longer appropriate
6. Child initiated major movement, positioning no longer appropriate

B. *Verbal Behavior*
1. Silence
2. Talk or question — uninterpretable
3. Talk or question — nondental matters
4. Talk or question — dental matters
5. Statement of hurt or discomfort — including "ouch!"
6. Verbal protest/complaint, i.e., "I don't want . . ." or termination request, "Stop it"
7. Verbal abuse/threats
8. Whimpering, sniveling, soft crying
9. Loud crying and screaming

C. *Comfort*
1. Comfort
   —— pleasantness
   —— lack of tension
   —— smile, laugh
   —— eyelids motionless except for normal blinks, no creases (or tensing) in upper lid of closed eye
   —— feet/hands relaxed
2. Neutral
3. Discomfort
   —— unpleasantness — tension — both minor and major
   —— grimaces — tensing of facial muscles
   —— tears in eye
   —— chokes, gags, coughs
   —— vomits
   —— feet/hands tensed
4. Unobservable

category encompasses the following behaviors: minor and problem movement, crying, screaming, whimpering, protest, hurt, and discomfort. All of these items are found in Glennon and Weisz's[16] Preschool Observation Scale of Anxiety.

Data Analysis

One of the major goals of this study was to identify patterns of behavior between auxiliaries and children. The study of such dependencies poses the most difficult measurement and analysis problem in observational research; analysis of the mutually-occurring sequence of behaviors is required.

The behaviors of child, dentist, and assistant were coded independently in real time from the videotape. The equipment used for the coding is called MORE (Microprocessor Operated Recording Equipment). This system involves a microprocessor unit with a small keyboard, a recorder, and a computer interface device. When the coder identifies an event, he presses a series of keys. Events are timed in seconds from the first keystroke of an event to the first keystroke of the next event. Following the coding, data are transferred to audio tape for storage and transmission to the host computer.[17-19]

Lag sequential analysis measures the number of times a particular child fear-related behavior follows a selected provider behavior, e.g. dentist direction, at each lag (step) removed from that behavior. Thus, a conditional probability (the probability behavior will occur given the presence of another behavior) can be obtained for the occurrence of a particular behavior immediately following the criterion (Lag 1), following an intervening behavior (Lag 2), and so forth. The assumption that underlies the application of this model is that people interact and behave according to probability rather than in simple stimulus-response patterns. A behavior is not always reacted to in the same manner, and the likelihood of a given response is not likely to be 1 or 0, but some intermediate.

The conditional probabilities for child responses to dentist and assistant behaviors are presented in this paper, as are the data concerning the relationship between assistant and dentist behaviors. Conditional probabilities are compared to unconditional probabilities, the probability that child-fear-related behavior will occur without regard to dentist or assistant behavior.

Results

Descriptions of the child management behaviors of the dental assistants are presented in Table 1. Results indicate that during most of the appointment assistants were silent, had no working contact with the child, and did not try to manage the child using guidance or empathy methods.

Tables 2-5 present two sets of results. These tables specify the conditional probabilities that child fear-related

Table 1. Distributions of Dental Assistant Behaviors Over the Appointment

Behavior	Frequency $\bar{X}$	Frequency S.D.	Duration $\bar{X}$	Duration S.D.
Guidance				
No guidance	19.4	11.9	1419.1	557.9
Explain	7.2	7.7	21.5	29.0
Reinforce	4.8	5.7	20.9	28.8
Direct	4.3	6.0	21.5	29.0
Rhetorical question	.3	.1	1.2	3.2
Rules	.0	.0	.0	.0
Coercion	.0	.0	.0	.0
Empathy				
Question feeling	1.2	2.2	7.3	15.9
Reassurance	1.5	2.6	9.2	16.8
Ignore/deny	.1	.3	.7	2.5
Putdown	.1	.3	.3	1.5
Physical Contact				
Work contact	12.0	9.6	171.5	175.0
Pat	1.5	2.0	24.5	61.6
Hold	2.9	4.4	113.2	164.6
Restrain	.5	1.4	7.3	29.5
Assist	.2	.5	2.1	5.3
No contact	19.6	10.2	1190.0	582.0
Verbalization				
Silence	30.1	2.0	1313.2	646.4
Dental to child	16.1	13.5	114.3	119.6
Distraction	4.1	7.4	28.6	49.4
Dental to dental	5.5	5.8	34.9	56.4
Chat	2.0	3.1	18.2	43.0

Table 2. Conditional Probabilities for Child Fear-Related Behavior Following Dentist and Dental Assistant Guidance Behaviors

Behavior	Professional	Lag 1	Lag 2	Lag 3
Direction	dentist	.199†	.245†	.267†
	assistant	.282	.374	.335
Explain	dentist	.300*	.289*	.278
	assistant	.403	.465*	.424
Rules	dentist	.479*	.378*	.381*
	assistant	.636*	.667*	.550*
Reinforce	dentist	.199†	.258†	.250†
	assistant	.315†	.460†	.316†
Coerce	dentist	———	———	———
	assistant	———	———	———
Coax	dentist	———	———	———
	assistant	———	———	———
Rhetorical	dentist	.257†	.299*	.275
question	assistant	.417	.417	.527
No guidance	dentist	.320*	.276	.286*
	assistant	.461*	.416	.448*

* = Conditional probability of observed behavior was significantly ($p \leq .05$) higher than unconditional value.

† = Conditional probability of observed behavior was significantly ($p \leq .05$) lower than unconditional value.

Table 3. Conditional Probabilities for Child Fear-Related Behavior Following Dentist and Dental Assistant Empathy Behaviors

Behavior	Professional	Lag 1	Lag 2	Lag 3
Questioning	dentist	.366*	.472*	.371†
for feeling	assistant	.404†	.584*	.464†
Reassure	dentist	.484*	.548*	.522*
	assistant	.634*	.587*	.631*
Ignore/deny	dentist	———	———	———
	assistant	———	———	———
Putdown	dentist	———	———	———
	assistant	———	———	———

* = Conditional probability of observed behavior was significantly ($p \leq .05$) higher than unconditional value.
† = Conditional probability of observed behavior was significantly ($p \leq .05$) lower than unconditional value.

Table 4. Conditional Probabilities for Child Fear-Related Behavior Following Dentist and Dental Assistant Physical Contact Behaviors

Behavior	Professional	Lag 1	Lag 2	Lag 3
Working/contact	dentist	.429*	.401	.429*
	assistant	.318†	.412	.309†
Pat	dentist	.295†	.333†	.286†
	assistant	.455*	.495*	.410
Hold	dentist	.618*	.545*	.545*
	assistant	.459*	.462*	.447*
Restrain	dentist	.846*	.833*	.818*
	assistant	.583*	.625*	.668*
Assist	dentist	.278†	.329†	.218†
	assistant	.383*	.538*	.564*
No contact	dentist	.360†	.381	.358†
	assistant	.427*	.385†	.426*

* = Conditional probability of observed behavior was significantly ($p \leq .05$) higher than unconditional value.
† = Conditional probability of observed behavior was significantly ($p \leq .05$) lower than unconditional value.

behaviors will follow both assistant and dentist behaviors. Though comparisons of patterns over particular behaviors then may be made, statistical comparisons behavior by behavior may be misleading; only patterns will be discussed. The results for the assistant in the guidance dimension (Table 2) indicate that reinforcement is the only assistant behavior that results in a significantly lowered probability of child fear-related behavior (T-tests are used in all analyses.). Comparison of all dentist and assistant guidance behaviors over three lags indicates a pattern of higher probability of fear following assistant behaviors than for dentists utilizing the same behaviors.

The results for the assistant in the empathy dimension (Table 3) indicated that in two of three lags assistant questioning for feeling resulted in lowered probabilities of fear-related behavior. Though dentist questioning for feelings yielded lower probabilities of fear-related behavior, comparison of dentist and assistant unconditional and conditional probabilities tends to show that fear-related behavior is enhanced in two of three lags when the dentist uses the technique, and decreases in two of three lags when the assistant uses the technique. The pattern for reassurance, the only other behavior with enough data, indicates that children show enhanced fear-related behavior when both assistants and dentists employ this behavior. Assistants appear to generate a greater probability of fear-related behavior with reassurance than dentists over all three lags.

The results of physical contact dimension, presented in Table 4, yielded interesting findings. Though holding and restraining elevated the probability of subsequent fear-related behavior for both providers, assistants generated less fear over all three lags. In addition, for two of three lags, the probability of child fear-related behavior when the assistant was in working contact with the child was lowered. Comparison to dentist working contact appears favorable. On the other hand, pats (physical reassurances) presented a very different pattern. Assistant pats in two of three lags resulted in enhanced probabilities of fear-related behavior when compared to unconditional probabilities. Moreover, the pattern of probabilities does not appear as effective in reducing fear-related behaviors when compared to dentist pats.

Table 5 presents the results of the verbalization dimension. When assistant and dentist patterns are compared, results for all five behaviors over all lags indicate higher probability of fear-related behavior following assistant behavior. Yet, there is some indication that assistant dentally-oriented communication to both the child and dentist, as well as chatting to the dentist results in less child fear than when fear was calculated without regard for these assistant behaviors.

Correlations between duration of dentist and assistant behaviors is presented in Table 6. Results, though significant in more than half the correlations, indicated a low or moderate relationship between dentist and assistant behaviors used over the appointment. The pattern of the relatively high frequency dentist and assistant guidance behaviors is explored in Table 7. This Lag 1 analysis shows the probabilities of dental assistant behavior following dentist behavor. Though results indicate the most probable behavior for the assistant following dentist direction, explanation, or reinforcement, is "no guidance," it appears that the second most-likely behavior is the assistant counterpart of the dentist behavior. For example, if the dentist explains something to the child, the probability of subsequent assistant explaining is enhanced. Table 8 presents patterns of behavior when assistant or dentist is not interacting with the child (no guidance, contact, verbalization, or empathy). Results in-

Table 5. Conditional Probabilities for Child Fear-Related Behavior Following Dentist and Dental Assistant Verbalization Behaviors

Behavior	Professional	Lag 1	Lag 2	Lag 3
Silence	dentist	.275†	.290	.268†
	assistant	.416	.416	.416
Dental/to child	dentist	.311†	.294	.316*
	assistant	.384†	.441*	.399†
Distraction	dentist	.360*	.319*	.322*
	assistant	.499*	.537*	.469*
Dental/to dental	dentist	.269†	.284	.272†
	assistant	.327†	.386†	.318†
Chat	dentist	.211	.218	.239
	assistant	.305†	.360†	.312†

*= Conditional probability of observed behavior was significantly ($p \leq .05$) higher than unconditional value.

†= Conditional probability of observed behavior was significantly ($p \leq .05$) lower than unconditional value.

Table 6. Correlations Between Duration Dentist and Assistant Behavior Within Appointments Using Kendall's Tau

Behaviors	*tau*	p
Guidance		
Direction	.24	.02
Explain	.02	ns
Rules	−.04	ns
Reinforce	.15	.03
Coerce	.41	.001
Coax	.35	.002
Rhetorical question	.14	ns
Empathy		
Questioning for feeling	.06	ns
Reassurance	.42	.001
Ignore/deny	.20	.007
Putdown	———	———
Physical Contact		
Working contact	.14	ns
Pat	.30	.001
Hold	.27	.001
Restrain	.40	.001
Assist	−.09	ns
No contact	.07	ns
Verbalization		
Silence	−.03	ns
Dental to child	−.06	ns
Distraction	.17	.02
Dental to dental	.49	.001
Chat	.55	.001

dicate when the dentist or assistant show no guidance, the probability that the other member of the team will show no guidance decreases.

Discussion

The descriptive statistics presented in Table 1 indicated that the role of the dental assistant in chairside child management is minimal. This finding is supported by

Table 7. Probability of Assistant Guidance Behaviors Following Dentist Guidance Behavior at Lag 1

Dentist Guidance/ Behavior	Assistant Guidance/ Behavior	Probability
Direction	No direction	.862
	Direction	.055
	Explain	.039
	Reinforce	.035
Explain	No direction	.853
	Direction	.032
	Explain	.078
	Reinforce	.033
Reinforce	No direction	.868
	Direction	.035
	Explain	.029
	Reinforce	.065

Table 8. Pattern of Dentist and Assistant Behavior at Lag 1

Other Variable	Assistant Behavior Follows Dentist Behavior	Dentist Behavior Follows Assistant Behavior
Silence	ns	ns
No guidance	.399†	.818†
No empathy	ns	ns
No contact	ns*	ns

*= Conditional probability of observed vs. unconditional values is significant (at $p < .05$ level).

†= No significant difference in observed vs. unconditional probability of behavior.

Starkey's[14] observation that dentists appear to prefer the dental assistant "to be rather passive and to say little."

This study, which should be replicated elsewhere, points to a set of child management behaviors which the assistant may effectively utilize. Holding the child prior to disruptive movement and restraining appear to be well accepted and effective assistant behaviors in management of difficult or problem children. Other behaviors, e.g., reinforcement of positive behavior and perhaps questioning for feeling and some dentally-oriented communication appear to be used by assistants with at least some effectiveness. Surprisingly, assistant pats were ineffective. This may be because pats are given only when the child already is showing frequent and high fear and are not used in any preventive manner as is holding.

Tables 6-8 revealed factors that influence assistant behavior. Though correlations yield, at best, moderate relationship between assistant and dentist behavior, the probabilities of dental assistant behavior following dentist behavior reveal that assistants look to dentists to model behavior. Reciprocal functioning is minimal; however, when one of the team is not providing guidance to the child, there is an enhanced probability the other will do so.

Conclusion

The following are major conclusions of our study:

1. Reinforcement is the only assistant behavior in the guidance dimension that results in significantly lowered probability of child fear-related behavior.
2. Questioning for feeling appears to be an effective empathic behavior for assistants and reassurance results in greater probability of fear-related behavior for both dentists and assistants.
3. Though holding and restraining elevated the probability of subsequent fear-related behavior for both providers, the assistant generated less fear.
4. Dentists appear to model behavior for assistants. For example, if the dentist uses explanation, the probability of subsequent assistant explaining is enhanced.

This study has presented data to indicate that there is something to be gained by enhancing the role of the dental assistant in some areas. Assistants may be effective in the use of reinforcement, questioning for feelings, holding, and restraining. Formal in-service training would help provide these behavior management skills.

This study was supported by Grant # DE-04770, National Institute of Health.

Dr. Weinstein is associate professor; Dr. Getz is lecturer; Dr. Ratener is research associate; and Dr. Domoto is associate professor, Departments of Community Dentistry and Pedodontics, University of Washington, Seattle, Wash. 98195. Reprint requests should be sent to Dr. Weinstein.

1. Sackett, D.L., Haynes, R.B., eds. Compliance with Therapeutic Regimens. Baltimore: John Hopkins University Press, 1976.
2. Haynes, R.B., Taylor, D.W., Sackett, D.L., eds. Compliance in Health Care. Baltimore: John Hopkins University Press, 1979.
3. Sarnat, H., Peri, J.N., Nitzan, E., Perlberg, A. Factors which influence cooperation between dentist and child. J Dent Ed 36:9-15, 1972.
4. Weinstein, P., Smith, T.A., Bartlett, R.C. A study of the dental student-patient relationship. J Dent Res 52:1287-92, 1973.
5. Wurster, C.A., Weinstein, P., Cohen, A.J. Communication patterns in pedodontics. Percept Mot Skills 48:159-66, 1979.
6. Moretti, R.J., Curtiss, G., Hoerman, K.C. Dentist nonverbal communication skills, patient anxiety, and patient treatment satisfaction. IADR Program and Abstracts No. 779. J Dent Res 61:265, 1982.
7. Weinstein, P., Smith, T.A., Packer, M. Method for evaluating patient anxiety and the interpersonal effectiveness of dental personnel: an exploratory study. J Dent Res 50:1324-26, 1971.
8. Strack, B.B., McCullough, M.A., Conine, T.A. Compliance with oral hygiene instruction and hygenists' empathy. Dent Hyg 54:181-84, 1980.
9. MacKenzie, R.S., McCollum, N., Nicewonger, M. Influencing human behavior in the dental clinic. J Am Dent Hyg Assoc 42:11-18, 1968.
10. Spencer, P.R. The role of the dental assistant in the management of the handicapped patient. Dent Clin North Am 18:633-42, 1974.
11. Walker, J. Show-and-tell children. Dent Assist 41:13,40, 1972.
12. Taylor, D. Achieving cooperative behavior from the child patient: from a dentist . . . an outline. Dent Assist 44:10,50, 1975.
13. Whitmore, M. Achieving cooperative behavior from the child patient: from a dental assistant . . . guidelines. Dent Assist 44:11-12, 1975.
14. Starkey, P.E. Training office personnel to manage children, in Wright, G.Z., ed. Behavior Management in Dentistry for Children. Philadelphia: W.B. Saunders Co., 1975, pp 221-35.
15. Weinstein, P., Getz, T., Ratener, P., Domoto, P. The effect of dentists' behaviors on fear-related behaviors in children. JADA 104:32-38, 1982.
16. Glennon, B., Weisz, J.R. An observational approach to the assessment of anxiety in young children. J Consult Clin Psychol 46:1246-57, 1978.
17. Sackett, G.P. Measurement in observational research, in Sackett, G.P. ed. Observing Human Behavior, Vol. II. Baltimore: University Park Press, 1973.
18. Sackett, G. Digital data acquisition systems for observing behavior in laboratory and field settings. Behav Res Methods Instruments 5:344-48, 1979.
19. Sackett, G. A Fortran®program for lag sequential analyses of contingency and cyclicity in behavioral interaction data. Behav Res Methods Instruments 11:366-78, 1979.

Quotable Quote

Nursing mothers who consume caffeine or smoke marijuana may pass the chemicals to their infants. John Findlay, a chemist at Burroughs Wellcome Drug Co., found that as much as 2% of the caffeine ingested by a mother ends up in her milk. And Mario Perez-Reyes, a psychiatrist at North Carolina Medical School, discovered traces of the chemical THC, the psychoactive ingredient in marijuana, in the milk of a pot-smoking mother and the waste of her baby. "If mothers want to smoke," Perez-Reyes advises, "they can give a bottle to the baby."

From: Science '82, Vol. 3, No. 10, December.