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Perception of Patient Cooperation Among Dentist, Guardian, and Child.

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
in Dentistry at Virginia Commonwealth University.

By

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Abstract

PERCEPTION OF PATIENT COOPERATION AMONG DENTIST, GUARDIAN, AND CHILD.

By: COLE ANTHONY STAINES, DDS

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Dentistry at Virginia Commonwealth University.

Virginia Commonwealth University, May 2019

Thesis Advisor: Erica Brecher, DMD, MS

Assistant Professor, Department of Pediatric Dentistry

Purpose: Evaluate behavior assessment and agreement among dentist, guardian, and child. Evaluate child behavior by appointment type.

Methods: Patients recruited from the pediatric dental department at Virginia Commonwealth University for this convenience sample. Inclusion criteria: patients presenting for clinical exams and/or restorative treatment without the use of advanced behavior guidance between August 29, 2018, and March 7, 2019; ages 4-12-years-old; and scheduled with a single clinician. Appointments were stratified by difficulty. Behavior was assessed by dentist and caregiver using the Frankl Scale. Patient self-assessed cooperation using an age-appropriate modified Frankl Scale, developed for this study. Agreement assessed among the 3 scores at each appointment using descriptive statistics and Cohen's Kappa. Behavior trends across appointment type assessed using Kruskal-Wallis test. SAS software (2013, Cary, NC). P-value < 0.05.

Results: Forty-one patient-guardian dyads enrolled in the study. Five dyads experienced multiple encounters. Demographics for the patients enrolled: 59% male; 44% Caucasian, 29% African American, 5% Asian, 2% Hispanic, 20% other/multiracial. Average patient age: 7.6 (range: 4-12). Most patients had 1 encounter (n=36, 88%). Frankl Score agreement for provider/guardian was 79% (k=0.335), provider/child was 70% (k=0.248), and guardian/child was 81% (k=0.314). In disagreements, guardians rated behavior better than provider. Disagreement was split for provider/child and guardian/child, with the child tending to rate themselves higher, and the guardian tending to rate the child higher respectively. Marginal evidence that hard appointments resulted in poorer behaviors.

Conclusion: There is fair agreement between child, guardian, and provider. In disagreements, guardians tend to rate the child's behavior better compared to the provider and child self-assessment. Dental providers tend to be more critical of patient behavior. Marginal evidence to support harder appointments result in poorer behaviors. Mutual understanding and agreement among provider, patient and guardian can help increase successful treatment planning and outcomes.

Introduction

Behavior guidance is paramount in the practice of pediatric dentistry. Per the American Academy of Pediatric Dentistry's (AAPD) "Guideline on Behavior Guidance for the Pediatric Dental Patient," behavior guidance techniques focus on helping patients recognize appropriate and inappropriate behaviors, teaches problem solving skills, and helps the child improve impulse control, empathy, and self-esteem ¹. This process involves the dentist, the dental staff, the parents, and the child receiving treatment. Ideally, behavior guidance results in improved communication between the child and the practitioner. This can help the dentist and staff cater to the child's individual needs to help provide safe and effective dental treatment, all while improving the child's oral health care attitudes.

Dental treatment can induce anxiety in any patient. The way a child behaves in the dental setting is multifactorial in nature. These factors include, but are not limited to: age, intellectual developmental, physical ability, presence of fears or anxiety (situational and/or general), prior medical or dental experience, parenting practices, cultural factors, and linguistic factors ^{1,2}. Child behavior is also associated with the type of dental procedure being completed. Understandably, previous research has indicated that more invasive procedures typically result in worse behavior outcomes ³. It is the responsibility of the dentist to identify these factors and formulate an individualized approach to work with each child. Advanced education in behavior management

is a key skillset that sets pediatric dentists apart from other dentists who treat children.

Understanding how to effectively select and utilize behavior management techniques is key for successful pediatric dental treatment.

There are several strategies that the pediatric dentist can use to help direct a child's behavior in the dental chair. These methods are categorized into two subsets: Basic and advanced behavior guidance techniques. Basic behavior guidance techniques include communication and communicative guidance, positive pre-visit imagery, direct observation of a well-behaved child (modeling), the use of tell-show-do and ask-tell-ask protocols, voice control, the use of non-verbal communication, positive reinforcement, descriptive praise, distraction, memory restructuring, parental presence or absence, and the use of nitrous oxide ^{1,2}. Most dental appointments are successful with the use of these techniques alone. However, some children may still be incapable of tolerating the stress of a dental procedure even after these techniques have been attempted. This may be due to young age (pre-cooperative stage), developmental delay, fear and anxiety, and/or a myriad of other reasons. These children may require advanced behavior guidance techniques to help safely complete required dental treatment. These techniques include protective stabilization, sedation, and general anesthesia ¹.

During the dental visit, patient behavior is assessed and recorded in the dental record. In dentistry, the Frankl Behavior Scale is used to evaluate the child's behavior (Figure 1). This 4-tier scale breaks child behavior into different levels ranging from definitely negative, to definitely positive ⁴. This behavior rating is accompanied by a short description of the child's behavior, which helps give more insight to the appointment and prepare for future appointments.

Common themes are observed throughout the existing literature discussing behavior of children in the dental setting. In most cases, younger children exhibit worse behavior than older

children ⁵. Brill noted that behavior generally declines throughout the course of the appointment, and then increases upon completion of the restorative procedure. This general trend was seen among all ages, however the decline in behavior was noticeably worse in younger patients ⁵.

Traditional parenting techniques are on the decline, which contributes vastly to the behavior exhibited by the child. Trends include a general increase in over-protectiveness and societal movements towards liberalism in which parents are less likely to set limits. These changes in parenting styles have negatively affected their child's behavior at the dental appointment. This has led to the parents having "increasingly lower expectations for their children, and higher expectations of the dentist ⁶." This places immense pressure on the dental provider to provide dental treatment for children who lack adequate coping skills in unfamiliar environments, i.e. the dental operator. This also may affect which behavior guidance techniques will be readily accepted by the caregiver. Research has demonstrated today's parents are more accepting of pharmacologic management (sedation and general anesthesia) and not as accepting of physical management of their children (protective stabilization, both active and passive restraint) ⁷.

Literature in the area of the psychological development of children proposes multiple styles of parenting. Baumrind suggests 3 main parenting types: Authoritative, Authoritarian, Permissive ⁸. Later, other psychologists broke down the permissive parenting styles even further into two categories: Indulgent, Uninvolved ⁹. The ideal parenting type involves parents having high expectations while also offering high levels of support and involvement in their child's life. This is demonstrated by the authoritative parent. Authoritarian parents also set boundaries and high expectations for their children, but fail to offer any additional emotional support or reasoning behind these expectations. Permissive patients allow the child to make his/her own

decisions and often fail to set boundaries/limitations. The permissive/indulgent parent will do so in order to please the child. The uninvolved parent provides basic needs to the child, without offering much emotional support. Both the indulgent and uninvolved parenting strategies often result in children who have difficulty dealing with authoritative figures ⁸⁻¹⁰.

Of the four types of parenting styles, poor behavior in the dental office is often observed from the children who have permissive and/or uninvolved parents ¹⁰. These parents fail to set boundaries and have low expectations and demands for their children. This typically results in uninhibited behavior in the dental setting and poorer oral hygiene practices at home. This makes treatment planning particularly difficult for the providing dentist. These patients may require more extensive treatment and lack the ability to cooperate in the traditional dental setting. Parents that have higher demands for their children typically instill characteristics more conducive to dental treatment, including coping strategies and obedience. However, even when the parent has high expectations for the child but fails to support the child, the child may lack the independence and self-confidence required to adequately sit for dental treatment ¹⁰.

Sharma et al emphasizes the importance of the assessment of a child's behavior. Appropriate assessment is required for the dentist to create a successful treatment plan ². The more information that the dentist can gather about the child, the better prepared he/she will be to devise a successful treatment plan that the child can tolerate. In addition, the dentist will be able to prepare which behavior guidance methods are best suited to help the patient cope with the stresses of the dental procedure ¹¹.

Guardian and child assessment of behavior can be of value to the dentist in facilitating future appointments. Prior research has shown that any information obtained about the child's behavior and coping skills can serve as valuable information to the dentist in formulating an

individualized treatment plan for the child. However, parenting techniques have changed throughout the years and may have resulted in many caregivers exhibiting unrealistic goals for both their child and the practicing dentist. It would be of value to determine whether or not this caregiver and child behavior assessment is reliable. If so, it can serve as an adjunct to the dentist to determine what type of treatment the patient may be able to tolerate at future appointments.

The purpose of this study is to (1) determine how the guardian's and child's assessments of the behavior exhibited at the appointment correspond with the assessment of the dental provider; and (2) assess behavior trends across different types of appointments. By understanding how the caregiver and child rate behavior exhibited at the dental visit, the dentist will be better prepared to adapt to future dental appointments. It is also of interest to evaluate which types of dental procedures, if any, elicit worse behaviors than others. This combined information may help to anticipate whether advanced behavior guidance techniques should be considered.

Methods

This study utilized a convenience sample research design. Patients were recruited from the pediatric dental clinics at Virginia Commonwealth University (VCU) and Children's Hospital of Richmond from August 2018 through March 2019. Inclusion criteria consisted of (1) children ages 4 to 12-years-old, (2) ASA 1 or 2, (3) age appropriate development, (4) English speaking children and guardians, (5) children able to receive treatment with basic behavior guidance alone, including the use of nitrous oxide/oxygen inhalation. This study was presented to and approved by the Institutional Review Board at VCU (study number: HM20012288). The subjects retained the right to withdraw from the study at any time, and their confidentiality was maintained throughout its course. Parental consent to participate in this study was obtained at the initial appointment. Child assent was obtained in all study candidates over the age of seven. A copy of the consent form is included in Appendix A. All participating dyads were offered \$5 compensation for their participation in the study. Those who presented for multiple appointments were offered a total compensation of \$15 (\$5 for initial appointment, \$10 for returning to the clinic).

Behavior was assessed by the both the provider and guardian using the Frankl Behavioral Rating Scale (Figure 1). A copy of the printout provided to the guardian is included in Appendix B. Children self-assessed cooperation using an age-appropriate Modified Frankl Behavioral Rating Scale, developed specifically for this study (Figure 2). At the completion of each

appointment the provider and guardian independently assigned a Frankl Score. Both the guardian and child were provided a printout (see Appendix B) and were asked to select to the Frankl Score that best corresponded with the child's behavior exhibited during the appointment. If the child was unable to read, the dentist read the options aloud to the patient. The guardian was encouraged to perform the score selection quietly to prevent influencing the child in any way. These values were then entered into a REDCap© online data entry form for data collection (Appendix B). To enhance the reliability of the study, all patients were schedule with a single provider.

Guardian-child dyads were followed across a variety of appointment types including exams/prophylaxis, sealants, restorative, extractions, space-maintenance, and interceptive orthodontics. These appointments were stratified by appointment type: Easy-, Easy, Hard, Hard+). This distribution is demonstrated in Figure 3. Only the dental provider assigned Frankl scores were used for the analysis of behavior exhibited by appointment types.

For patients who presented for multiple appointments during the study period, the behavior was assessed at each appointment and compared longitudinally. In these cases, the first of these appointments was a recall, new patient exam, or consultation. The subsequent appointments involved restorative treatment. In all but one appointment, the same caregiver brought the child to the following appointment(s).

Agreement among the scores was assessed using Cohen's Kappa (κ)¹². The association between behavior scores and difficulty of the appointment were assessed using Kruskal-Wallis test. Agreement by child's age and agreement by appointment type were assessed using Fisher's Exact test. Data was analyzed using SAS software (2013, Cary, NC) and the p-value was set to < 0.05.

Results

A total of 41 guardian-child dyads were enrolled in the study and had a total of 47 appointments. Five of the patients had more than one visit, with a maximum number of total visits of 3. Twenty-seven of the appointments were classified as a new patient exam or recall (with or without bitewing radiographs). These were classified as “Easy-.” Five of the restorative appointments were deemed “Easy” (i.e. sealants only, no local anesthetic), 10 were “Hard” (restorations/stainless steel crowns with local anesthesia), and 5 were “Hard+” (included extraction of erupted tooth). Demographic results are given in Table 1. The children were 59% male and 41% female, 44% were classified as Caucasian, 29% African American, 20% other or multiracial, 5% Asian, and 2% Hispanic. The average child age was 7.6 (SD: 2.3) and ranged from 4-12-years-old.

The provider and the guardian agreed on the Frankl score for 79% of the appointments and the agreement was rated fair ($\kappa=0.335$; 95% CI: 0.07-0.60). Between provider and the child, Frankl scores agreed for 70% of the visits and the agreement was fair ($\kappa=0.248$; 95% CI: -0.02-0.51). Between the guardian and the child, Frankl scores agreed in 81% of the visits and the agreement was again rated as fair ($\kappa=0.314$; 95% CI: 0.00-0.63). Results are given in Table 2.

When comparing the provider and the guardian ratings, there were 10 visits (21%) where the two disagreed. In all of these instances, the guardian rated the child’s behavior better than the

provider (Table 3). Between the provider and the child, there was disagreement on 14 visits (30%). The provider rated the child's behavior higher for 36% of the disagreements and the child rated him or herself higher for 64% of the visits (Table 4). Between the guardian and the child, there was disagreements on 9 visits (19%). The guardian rated the child's behavior higher for 89% of the disagreements and the child rated him or herself higher for just 11% of the visits (Table 5).

When analyzing the provider-assigned Frankl behavior scores based on appointment type, there was marginal evidence that visits classified as easy (recall, new patient exam, or sealants without local anesthesia) had better behavior outcomes than those classified as hard (restorations and SSC with local anesthesia or extractions of erupted teeth) (P-value=0.0660). For easy appointments, 81% were rated a Frankl 4 by the provider compared to 53% for hard appointments. Due to limited data across all types of appointments, both Easy- and Easy appointment types were combined in one group (Easy) and both Hard and Hard+ groups were combined into one group (Hard) for analysis. Results are presented in Figure 4.

When comparing the agreement (percent agreement rather than Kappa due to limited sample size), there were no significant relationships between the difficulty of the appointment and the agreement for any of the pairs (Table 6). Additionally, the agreement was not statistically associated with the child's age (Table 7).

There was insufficient data to fully analyze the trend in behavior across multiple visits since only 5 patients had multiple visits. However, a preliminary analysis of their behavior trends is presented in Figure 5. Subject number 1 had a total of 3 visits and saw decreasing behavior at each subsequent visit. This subject's three visits were in order: recall with bitewings, extraction and restorative treatment, and space maintenance. The other 4 subjects exhibited the same

behavior at the restorative appointment as was observed at the baseline appointment (recall/new patient exam/consultation).

Discussion

Patient cooperation is an integral part of the pediatric dental patient experience and behavior guidance is a key skillset unique to pediatric dentists. It is important to understand how caregivers and patients perceive dental appointments, as they are the fundamental components of the pediatric dental triangle (the dental provider/staff, the guardian, and the child)¹³. This information is useful to develop individualized behavior guidance plans to promote positive experiences for our pediatric patients.

Per this study, there appears to be fair agreement between the provider, guardian, and child in regard to the child's behavior exhibited throughout the dental appointment. When concentrating on the descriptive statistics, the highest percentage of agreement was between the guardian and the child (81%), followed by the provider and the guardian (79%). The lowest percentage of agreement was noticed between the provider and the child (70%). Despite the fair Kappa agreement score, the percentage agreements remained high for all three parties. This is due to the nature of the Cohen's Kappa analysis, which accounts for agreement by chance. The Kappa agreement was also reduced by the large number of higher Frankl scores (Frankl 3 and 4 patients). This weighted data affected the analysis.

In times of disagreement between the provider and guardian (21%), the guardian rated the child higher than the provider in all instances. This finding may be explained the recent parenting

trends described earlier with guardians having lower expectations for their children ⁶. When analyzing the disagreement between the guardian and child, the majority of appointments (all but one) involved the guardian rating the child's behavior higher than the child themselves, again supporting these recent trends in parenting.

Disagreement between the provider and the child was less consistent. For the majority of the appointments where there was a disagreement, the child rated themselves higher (64%). However, 36% of disagreement involved the provider rating the child higher. This was an interesting finding. Good behavior may not always indicate that the child is having an easy time with the appointment. One theory for this finding is that these children demonstrated adequate coping mechanisms and were able to tolerate the treatment despite being slightly uncomfortable. Alternatively, the wide range in cognitive development level of the study patients, ages 4 to 12-years-old, means that patients may have ranged from the pre-cooperative stage to the cooperative stage. These subjects had varying levels of understanding an appropriate level of comfort for a dental appointment. In future studies, it would be beneficial to stratify the results by more developmentally cohesive groups.

Although not statistically significant, analysis of the percent agreement of the three parties based on appointment difficulty provided interesting results. All of the easy type appointments had higher agreement scores than the more difficult appointments. These easy appointments generally resulted in better behavior outcomes. These trends help demonstrate the basic principles of the pediatric treatment triangle. Successful outcomes are more typical when all three members of the triangle are in agreement ¹³.

When the rate of agreement was broken down by age of the child, the association between age and agreement was not statistically significant. Both the younger children (age 4-7

years of age) and older children (age 8-12 years of age) responded similarly in the self-assessment. Even when younger children were read the choices of the Modified Frankl Behavioral Rating Scale, they were able to answer appropriately. This justifies the age range of child subjects in this study and further supports that the results obtained are homogenous in nature. This increases the validity of the other analyses performed in this project.

Analysis of the dental provider's assigned behavior ratings by appointment type provided marginal evidence to support the current literature: more invasive procedures eliciting poorer behavior outcomes in children³. In other words, Easy type appointments (Easy – and Easy appointments combined for analysis) resulted in higher Frankl scores, or more ideal behaviors, than Hard appointments (Hard and Hard + appointments combined for analysis). Easy appointments involved simpler, less invasive procedures such as prophylaxis, exams, radiographs (classified as Easy -), sealants, simple restorative without the administration of local anesthetic, or delivery/removal of space maintainer/interceptive orthodontic appliance (classified as Easy). Hard appointments included more invasive procedures: any restorative treatment with the administration of local anesthetic (classified as Hard) or extractions (classified as Hard +).

Not surprisingly, the Easy appointments resulted in a greater number of children who demonstrated ideal behavior (Frankl 4 scores). Hard appointments resulted in fewer Frankl 4 patients and a subsequent increase in both Frankl 2 and 3 behaviors. This data supports the previous findings in the literature, supporting a decline in patient behavior in appointments that involve “more threatening procedures”³.

Initially, an additional goal of this study was to also track patient behavior across multiple appointments. Due to difficulty with patient recruitment, this goal had to be modified to include patients presenting for a single appointment. Minimal data was included for patients that were

seen in the clinic across multiple appointments. This data was analyzed and is demonstrated in Figure 5. Although clinically insignificant due to low numbers of recruitment, trends do show either similar behaviors or a decline in behavior across multiple appointments. The decline in behavior supports previous findings where children tend to have increasingly negative behaviors across multiple appointments. In the previous literature, children initially became more “sensitized” to dental treatment before eventually becoming desensitized. This study showed a steady decline for 4 appointments before behavior improved over the fifth and sixth visits ¹⁴. This is something to consider when developing and discussing treatment plans with guardians. If patients demonstrate less than ideal behavior upon an initial operative appointment, other treatment modalities may be worth mentioning to the guardian.

This study has numerous strengths. This is the first study to assess the agreement of behavior scores among the dental provider, guardian, and child. This conclusion is based off an extensive literature review that was performed prior to initiating this study. Previous study efforts have concentrated more on child behavior related to maternal and patient anxiety about dental treatment ^{15,16}. This study also introduced a modified version of the Frankl Behavioral Rating Scale that may be used to receive feedback from children in future clinical and research efforts. This scale was readily accepted by all participants and guardians. Anecdotally, the children seemed to enjoy having the opportunity to contribute their opinion. This scale allows the providing dentist to obtain information about the success of the appointment from the child’s perspective. This additional information can be used for future behavioral research efforts and/or to facilitate treatment planning. This short questionnaire may also be of use in behavior guidance as it allows the child to self-reflect, while serving as a potential tool in memory restructuring (showing the child his/her rating prior to the subsequent treatment visit, “concrete evidence” ¹).

Despite the strengths of this study, there are a few limitations to consider. Although the Frankl Score is a widely used tool in pediatric dentist, it has some inherent subjectivity. To account for this, the same dental provider made all of the assessments at each appointment. However, not all practitioners rate behavior the same way. Due to the subjective nature of the assessment, it would be beneficial for future studies to include multiple provider ratings after calibration. While adequate, a larger sample size as well as a higher volume of longitudinal data may have provided more substantial results to future support the results of this study. A future direction of this study would be to bolster the longitudinal data to not only examine the agreement between provider, guardian and child at each appoint, but also to determine if the level of agreement is consistent across multiple appointments, and how it may vary by appointment type. In this study, the behavior ratings were predominantly Frankl 4, ranging from 62%-75% depending on the rater. None of the patients were rated 1 by any of the raters (provider, guardian, child). Therefore, the results cannot adequately address the ability of the three individuals to score behavior in situations with less ideal behavior. However, due to the nature of this convenience sample design and anecdotal evidence, it is anticipated that the behaviors exhibited in this study reflect what would typically be seen in practice. Frankl 1 behavior displayed by typically developing children in this age range is not expected. Even with more subjects, it is not anticipated that many Frankl 1 patients would be recruited. Finally, the comparison of behavior based on visit type (easy-, easy, hard, hard+) did not account for repeated measures on the few subjects who had multiple study visits.

Accurately assessing the behavior and perceptions of our young pediatric patients during dental visits is critical to providing quality dental treatment safely and efficiently. Further, as pediatric dentists, we have to manage both our pediatric patients as well as the desires and

expectations of the parents—which can be a difficult task in and of itself. Several of these strategies involve praising/rewarding the child, perhaps even during times when behavior is less than ideal. The goals of behavior guidance for the pediatric patient are inherently designed to allow the child to think positively about the experience. In many cases, this will certainly skew the child’s perception of the dental appointment in a more positive manner. This perhaps can explain why the majority of children and guardians, who were also present during the dental appointment listening to the praise of the dental provider, rated the behavior consistently higher. This is something to consider when obtaining guardian and child insight about the appointment.

Based on this study, it is apparent that there tends to be agreement among the provider, the guardian, and the child about the child’s behavior throughout the appointment. When considering the pediatric dentistry treatment triangle, it is important to consistently check in with the child and guardian throughout treatment and across multiple appointments. Special consideration should be placed on children that demonstrate ideal behavior throughout more difficult appointments. These children demonstrate adequate coping mechanisms to deal with less than ideal situations. This should not be taken lightly. As pediatric dentists, it is our role to ensure that the child is comfortable and is having positive dental experiences at every opportunity. This will increase the likelihood that ideal behaviors will continue to be displayed at subsequent appointments.

Conclusions

- 1) There was fair agreement among the provider, guardian, and child when assessing the child's behaviors exhibited during the dental appointment using Kappa statistic.
However, percentage agreements between all three parties were high.
- 2) Dental providers tend to be more critical of the child's behavior than the guardian and child him/herself.
- 3) More invasive procedures may be associated with lower Frankl scores than less invasive procedures.
- 4) Good behaviors demonstrated by children may not always indicate that the child is having an easy time with the appointment.
- 5) Mutual understanding and agreement between all three parties of the pediatric dental treatment triangle can help increase successful treatment planning and outcomes.
- 6) More research/data is indicated to explore how recent parenting techniques and behavior trends affect dental treatment and outcomes.

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Table 1: Demographics of Children Enrolled in Study

	n	%
Gender		
Male	24	59%
Female	17	41%
Race/Ethnicity		
White	18	44%
African American	12	29%
Hispanic	1	2%
Asian	2	5%
Other or multiracial	8	20%
Visit Type		
Easy- (NPE or Recall w or without BW)	27	57%
Easy (i.e.- sealants only, no LA)	5	11%
Hard (i.e. restorations and SSC, LA)	10	21%
Hard+ (including extraction of erupted tooth)	5	11%
NPE=new patient exam; BW=bitewings; LA=local anesthesia; SSC=stainless steel crown		

Table 2: Agreement in Behavior Ratings

	Kappa	95% CI	% Agreement
Provider-Guardian	0.335	0.07 0.60	79%
Provider-Child	0.248	-0.02 0.51	70%
Guardian-Child	0.314	0.00 0.63	81%

Table 3: Breakdown of Provider-Guardian Frankl Score Ratings

		Guardian			
		1	2	3	4
Provider	1	0	0	0	0
	2	0	0	1	2
	3	0	0	3	7
	4	0	0	0	34

Table 4: Breakdown of Provider-Child Frankl Score Ratings

		Child			
		1	2	3	4
Provider	1	0	0	0	0
	2	0	0	2	1
	3	0	0	4	6
	4	0	0	5	29

Table 5: Breakdown of Guardian-Child Frankl Score Ratings

		Child			
		1	2	3	4
Guardian	1	0	0	0	0
	2	0	0	0	0
	3	0	0	3	1
	4	0	0	8	35

Table 6: Rate of Agreement based on Difficulty of the Appointment

Percent Agreement			
	Easy	Hard	P-value*
Provider-Guardian	84%	67%	0.2521
Provider-Child	72%	67%	0.7422
Guardian-Child	84%	73%	0.4381

*P-value from Fisher's Exact Test

Table 7: Rate of Agreement based on the Age of the Child

Percent Agreement			
	4 to 7 Years Old	8-12 Years Old	P-value*
Provider-Guardian	73%	86%	0.4754
Provider-Child	73%	67%	0.7519
Guardian-Child	88%	71%	0.2631

*P-value from Fisher's Exact Test

Figure 1: Frankl Behavioral Rating Scale

Frankl Behavioral Rating Scale	
Score	Description
1 (--)	Definitely negative. Refusal of treatment, forceful crying, fearfulness, or any other overt evidence of extreme negativism.
2 (-)	Negative. Reluctance to accept treatment, uncooperative, some evidence of negative attitude but not pronounced (sullen, withdrawn).
3 (+)	Positive. Acceptance of treatment; cautious behavior at times; willingness to comply with the dentist, at times with reservation, but patient follows the dentist's directions cooperatively.
4 (++)	Definitely positive. Good rapport with the dentist, interest in the dental procedures, laughter and enjoyment.

Figure 2: Modified Frankl Behavioral Rating Scale

Modified Frankl Behavioral Rating Scale	
Score	Description
1 (--)	This appointment was too hard. I couldn't get through it.
2 (-)	This appointment was tough. I needed a lot of help to get through it.
3 (+)	That was a little hard for me, but I could do it.
4 (++)	That was easy.

Figure 3: Appointment Types

Appointment Types	
Easy -	Recall/New patient exam/Consultation (with or without radiographs)
Easy	Sealants, Procedures without administration of local anesthetic
Hard	Restorative with administration of local anesthetic
Hard +	Treatment includes extraction(s)

Figure 4: Provider Frankl Scores based on Difficulty of Appointment

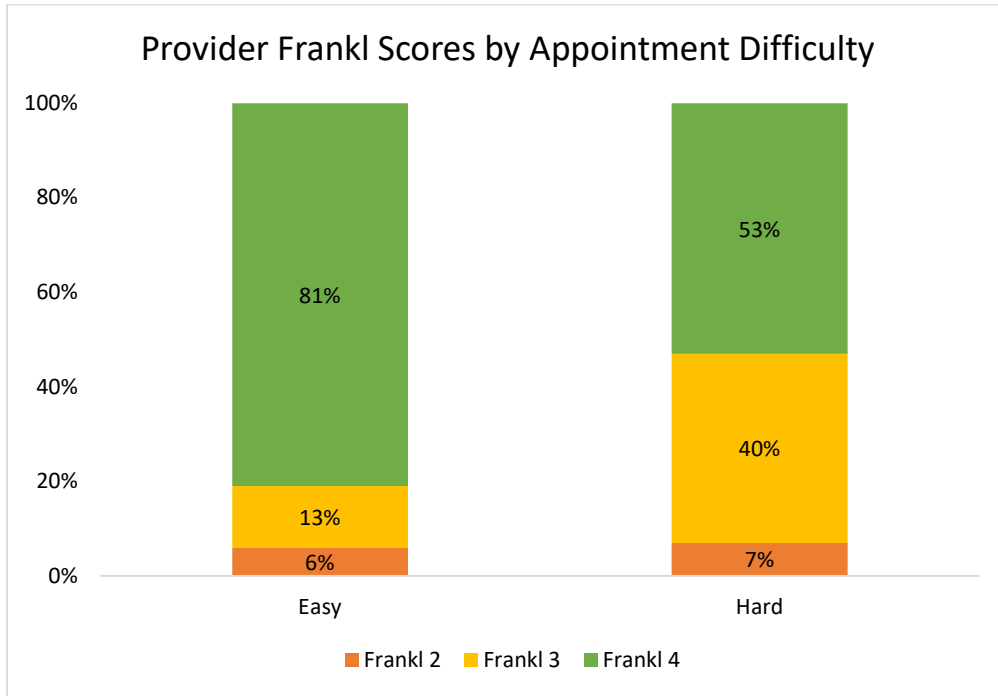
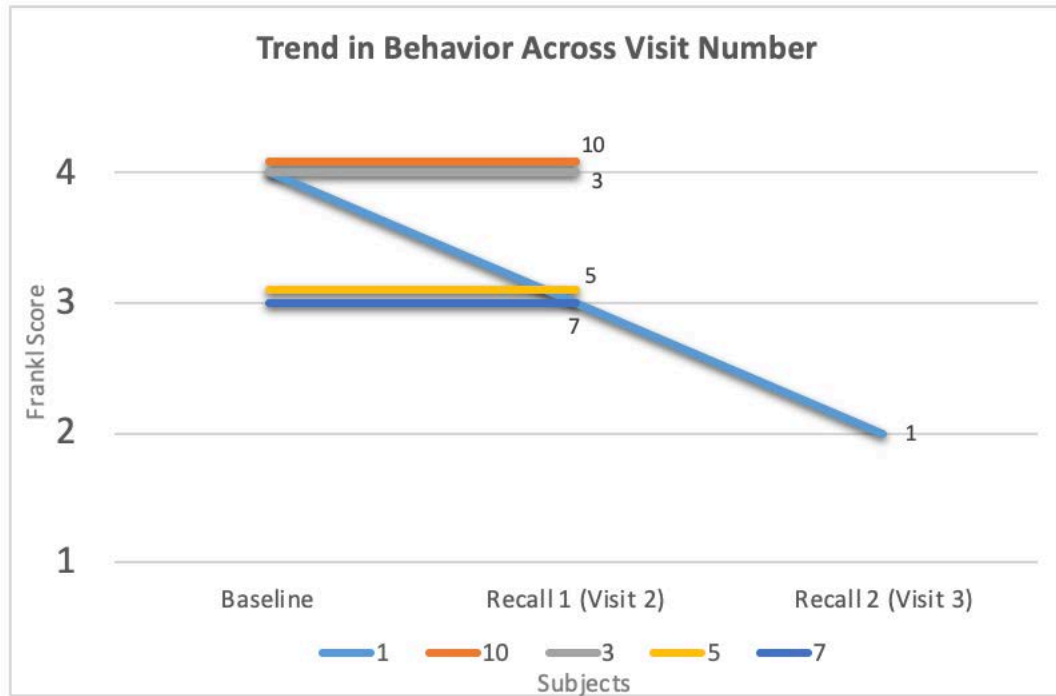


Figure 5: Trend in Provider Frankl Scores Across Study Visits for Subjects with Multiple Visits (n=5)



Appendix

Appendix A: Parental Consent and Child Assent Forms

RESEARCH SUBJECT INFORMATION AND CONSENT FORM

TITLE: “A comparison of caregiver and patient self-assessment in the pediatric dental office.”

VCU IRB NO.: HM20012288

INVESTIGATOR: Erica Brecher, DMD, MS; Cole Staines, DDS

SPONSOR: VCU

If any information contained in this consent form is not clear, please ask the study staff to explain any information that you do not fully understand. You may take home an unsigned copy of this consent form to think about or discuss with family or friends before making your decision.

PURPOSE OF THE STUDY

The purpose of this study is to (1) determine how parent/guardians’ and patients’ assessments of the behavior exhibited at the dental appointment correspond with the assessment of the dentist; and (2) assess behavior trends across multiple appointments.

You are being asked to participate in this study because you have a child that attends the Virginia Commonwealth University Pediatric Dental Clinic and he/she needs dental treatment.

DESCRIPTION OF THE STUDY AND YOU AND YOUR CHILD’S INVOLVEMENT

If you decide to be in this research study, you will be asked to sign this permission form after you have had all your questions answered and understand what will happen to you and your child.

In this study, you and your child will be asked rate the child’s behavior at the end of each dental appointment. The appointment may be for a new patient exam, cleaning/exam, sealants, fillings, and/or extractions. A “behavior rating scale” will be provided to both caregiver and the child to use as a guide You and your child will be asked to rate the child’s behavior after each appointment, until all planned treatment has been completed.

Significant new findings developed during the course of the research which may relate to your willingness to continue participation will be provided to you.

RISKS AND DISCOMFORTS

Participation in this study may lengthen your child’s dental appointment by approximately 5-10 minutes. This time will be spent explaining the behavior rating scale

to both the guardian and the child. Another potential risk is a breach in confidentiality of the information collected in this study.

BENEFITS TO YOU AND OTHERS

You may not get any direct benefit from this study, but, the information we learn from people in this study may help dentists better prepare for treating young children in the future.

COSTS

There are no costs for participating in this study other than the time you and your child will spend in the pediatric dental clinic.

PAYMENT FOR PARTICIPATION

You will receive a \$5.00 payment for the initial appointment, and will receive \$10.00 when you and your child finish participation in this study, which is after the completion of the final regularly scheduled visit.

You may be asked to provide your social security number in order to receive payment for your participation. Your social security number is required by federal law. It will not be included in any information collected about you for this research. Your social security number will be kept confidential and will only be used in order to process payment.

ALTERNATIVES

This study will not alter planned treatment by any means. The only alternative would be to not participate in the study.

CONFIDENTIALITY

Potentially identifiable information about you will consist of treatment data abstracted from the medical record. Data is being collected only for research purposes.

As part of this research study, we will ask you to share identifiable health information with us and/or permit us to access existing information from your healthcare records. New health information may also be created from study-related tests, procedures, visits, and/or questionnaires. This type of information is considered "Protected Health Information" that is protected by federal law.

In the future, identifiers might be removed from the information and samples you provide in this study, and after that removal, the information/samples could be used for other research studies by this study team or another researcher without asking you for additional consent.

What type of health information will be used or shared with others during this research?

The following types of information may be used for the conduct of this research: Dental records, which include information of the child's behavior.

Who will use or share protected health information about me?

VCU and VCU Health are required by law to protect your identifiable health information. By consenting to this study, you authorize VCU/VCU Health to use and/or share your health information for this research. The health information listed above may be used by and/or shared with the following people and groups to conduct, monitor, and oversee the research:

- Principal Investigator and Research Staff
- Health Care Providers at VCU Health
- Institutional Review Boards
- Government/Health Agencies
- Others as Required by Law
- Study Sponsor
- Data Coordinators
- Research Collaborators
- Data Safety Monitoring Boards

Once your health information has been disclosed to anyone outside of this study, the information may no longer be protected under this authorization.

When will this authorization (permission) to use my protected health information expire?

This authorization will expire when the research study is closed, or there is no need to review, analyze and consider the data generated by the research project, whichever is later.

Statement of Privacy Rights

You may change your mind and revoke (take back) the right to use your protected health information at any time. However, even if you revoke this authorization, the researchers may still use or disclose health information they have already collected about you for this study. If you revoke this Authorization you may no longer be allowed to participate in the research study. To revoke this Authorization, you must write to the Principal Investigator.

Your data will be identified by ID numbers, not names, and stored separately from research data in a locked research area. All personal identifying information will be kept in password protected files and these files will be deleted upon completion of the study (June 2019). Access to all data will be limited to study personnel. De-identified research data will be maintained for the minimum retention period at VCU (minimum of 5 years post- study closure for non-HIPAA data, minimum of 6 years for HIPAA data).

We will not tell anyone the answers you and your child give us; however, information from the study and information from your medical record and the consent form signed

by you may be looked at or copied for research or legal purposes by the sponsor of the research or by Virginia Commonwealth University. Personal information about you might be shared with or copied by authorized officials of the Department of Health and Human Services or other federal regulatory bodies.

If, as part of this research, we learn about real or suspected child abuse, the law says that we have to let people in authority know so they can protect the person(s) at risk.

VOLUNTARY PARTICIPATION AND WITHDRAWAL

Your and your child's participation in this study is voluntary. You may decide to not participate in this study. Your decision not to take part will involve no penalty or loss of benefits to which you are otherwise entitled. If you do participate, you may freely withdraw from the study at any time. Your decision to withdraw will involve no penalty or loss of benefits to which you are otherwise entitled.

Your participation in this study may be stopped at any time by the study staff or the sponsor without your consent. The reasons might include:

- the study staff thinks it necessary for your health or safety;
- you have not followed study instructions;
- the sponsor has stopped the study; or
- administrative reasons require your withdrawal.

QUESTIONS

If you have any questions, complaints, or concerns about your participation in this research, contact:

Cole Staines, DDS
VCU Pediatric Dental Resident
stainesca@vcu.edu
804-828-9095
521 N 11th St, Richmond VA 23298

Erica Brecher, DMD, MS
Assistant Professor, Department of Pediatric Dentistry at VCU
eabrecher@vcu.edu
804-828-1790

Wood Memorial Building, Room 317
521 N 11th St
P.O. Box 980566
Richmond VA 23298

The researcher/study staff named above is the best person(s) to call for questions about your participation in this study.

If you have any general questions about your rights as a participant in this or any other research, you may contact:

Office of Research
Virginia Commonwealth University
800 East Leigh Street, Suite 3000
Box 980568
Richmond, VA 23298
Telephone: (804) 827-2157

Contact this number to ask general questions, to obtain information or offer input, and to express concerns or complaints about research. You may also call this number if you cannot reach the research team or if you wish to talk with someone else. General information about participation in research studies can also be found at http://www.research.vcu.edu/human_research/volunteers.htm.

CONSENT

I have been given the chance to read this consent form. I understand the information about this study. Questions that I wanted to ask about the study have been answered. My signature says that I am willing to participate in this study, and also give my child permission to participate in this study. I will receive a copy of the consent form once my child assents and I have agreed to participate.

Name of Child

Participant name printed	Participant signature (If over 7)	Date
--------------------------	-----------------------------------	------

Name of Parent or Legal Guardian (Printed)

Parent or Legal Guardian Signature	Date
------------------------------------	------

Name of Person Conducting Informed Consent Discussion (Printed)

Signature of Person Conducting Informed Consent Discussion Date

Principal Investigator Signature (if different from above) Date

Appendix B: Data Entry Form

My First Instrument

Please complete the survey below.

Thank you!

Study ID _____

Visit Number

- Baseline
- Recall 1 (Visit 2)
- Recall 2 (Visit 3)
- Recall 3 (Visit 4)

Date of visit

Sex of the child

- Male
- Female

Child's Age

(ENTER WHOLE NUMBER BETWEEN 4 AND 12)

Child's Race/Ethnicity

- White
- African American
- Hispanic
- Asian
- Other or multiracial

Caregiver

- Mother
- Father
- Other

Please describe caregiver:

Please indicate the type of appointment

- NPE, No BW
- NPE, BW
- Recall, No BW
- Recall, BW

Please indicate the type of recall visit:

- Easy (i.e. - sealants only, no LA)
- Hard (i.e. restorations and SSC, LA)
- Hard+ (including extraction of erupted tooth)

Did the child receive Nitrous Oxide?

- Yes
 No

Quadrants treated today (select all that apply):
 (Select all that apply)

- UR
 UL
 LL
 LR

Injection Type (select all that apply):
 (Select all that apply)

- Mx posterior infiltration
 Mx anterior infiltration
 Md posterior infiltration
 Md anterior infiltration
 IANB
 Palatal

Isolation:

- CRI
 RDI
 Isovac

Duration of appointment (in minutes)

Use the space provided to describe the visit (i.e. treatment details; treatments completed)

PROVIDER: Frankl

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

Caregiver

CAREGIVER: Frankl

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



Child

CHILD: Frankl

- 1- This appointment was too hard; I couldn't get through it.
- 2- This appointment was tough, I needed a lot of help to get through it.
- 3- That was a little hard for me, but I could do it.
- 4- That was easy.

