A Study of the Relationship of Parenting Styles, Child Temperament, and Operatory Behavior in Healthy Children

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***Aim**: The purpose of this study was to assess the relationship of the child's temperament, parenting styles, and parents' prediction of their child's behavior in the dental setting. **Study design:** Subjects were healthy children 4-12 years of age attending a dental clinic. A Parenting Styles and Dimensions Questionnaire (PSDQ) was given to parents to determine their parenting style. Parents completed the Emotionality, Activity, Sociability Temperament (EAS) survey to measure their child's temperament. Parents were asked to predict their child's behavior using the Frankl Scale. **Results**: Data analysis included 113 parent/child dyads. Parents accurately predicted their child's behavior 58% of the time. Significant correlations were noted between parent's predictions of behavior and emotionality ($r = -.497$, $p < .001$), activity ($r = -.217$, $p < .009$), and shyness ($r = -.282$, $p < .002$) of EAS. Significant correlations were found between actual behavior and emotionality ($r = -.586$, $p < .001$), activity ($r = -.196$, $p < .03$), and shyness ($r = -.281$, $p < .003$). Parenting style scores did not correlate to predicted or actual behavior; however, categories of PSDQ were related to parental predictions of behavior. **Conclusions**: Relationships between temperament and parenting may aid in predicting children's behavior in the operatory.*

Key words: Children Parenting, Dentistry, Behavior.

INTRODUCTION

Child temperament is an important factor associated with aspects of oral health care.[1-8] Temperament is the "how" of behavior, a "behavioral style," or the characteristic way that a child experiences and responds to the environment.[5, 9, 10] Buss and Plomin split temperament into four tendencies: shyness, sociability, activity, and emotionality.[2] The Emotionality, Activity, and Sociability Temperament Survey (EAS) measures five characteristics of temperament: negative emotionality, impulsivity, activity, sociability, and shyness.[2, 5, 6] Negative emotionality is defined as hiding, fear, anger, temper tantrums, and crying.[2] Activity is characterized by vigor and tempo or the total energy output.[2] Sociability is the tendency to prefer the presence of others rather than being alone.[2] Shyness is the trait of being slow to warm up in novel social situations.[2] Impulsivity is defined as speed of response initiation.[11] The impulsivity dimension is no longer included in the EAS due to insufficient evidence of its heritability, but it is still included in other theoretical models.[11] The three-factor EAS model is a better and more efficient predictor of personality and behavior than Thomas and Chess' nine-factor model.[5] The EAS temperament survey is more user-friendly than the Toddler Temperament Scale (TTS) and Behavior Style Questionnaire (BSQ) because it contains only 25 items.[5, 6] The EAS Temperament Survey for children is an instrument for measuring temperament traits and predicting personality and behavior.

Parenting style is a constellation of attitudes toward child-rearing.[6] Changes in parenting styles have purportedly affected the provider's ability to effectively use behavior guidance.[12, 13] With changes in parenting styles in recent decades, there has been an increasing number of children who lack the self-discipline and skills necessary to deal with dental treatment.[14] In that vein, parents who set few limits and submit to their children's demands, but felt relaxed and emotionally-supportive were more likely to have children who misbehaved in the dental office.[15] Children are more disruptive and oppositional when their parents are more critical, lax, and disengaged from their child's everyday life.[15] The family is becoming a more democratic unit and children can out-maneuver their parents with the evolution in parenting styles.[16] On the contrary, a high level of behavioral control, parental involvement, and affection are related to low levels of externalizing problems, such as conduct disorders.[17, 18] Parents help minimize problem behaviors and maximize self-efficacy and personal, emotional, and cognitive development.[16] Specific

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aspects of parents' behavior influences their child's behavior.[3, 4, 7, 19, 20] Studies have found that parent-child interactions and their relationship can predict their child's behavior.[7]

From a behavior guidance perspective in the dental setting, the effectiveness of behavior guidance has been influenced by changes in parenting styles.[21, 22] Possibly, the conceptual change from behavior management to behavior guidance is driven, in part, by the evolution of parenting styles. In some respects, it is possible that the efficacy of non-pharmacologic behavior guidance strategies may be affected by a limited behavioral capacity of the child and a decreased willingness of the parents to expect their child to cooperate.[21, 22] A child's cognitive level, previous experiences, temperament, fears, and attachment to his or her parent all contribute to the ability to tolerate dental procedures.[22]

Baumrind created a theoretical model that incorporated behavioral and emotional processes into a conceptualization of parenting style based on parents' belief systems.[23] Baumrind's three parenting styles (authoritative, authoritarian, and permissive) affect the emotional well-being and development of competence in their child. It is unclear if the dynamics of parenting styles may need to be re-configured, but her theoretical underpinnings continue to dominate the current thought on parenting styles. The Parenting Styles and Dimensions Questionnaire (PSDQ) is one metric to assess the level of a parent's parenting style based on Baumrind's initial parenting typologies.[19] Robinson et al.,[24] performed a study assessing Baumrind's global typologies and also identified parenting practices that occur within the context of the typologies. His analysis identified not only the three typologies of authoritative, authoritarian, and permissive parenting styles, but also questions or factors supportive of each of the global typologies. For Authoritative typology, these factors were a) warmth and involvement, b) reasoning/induction, c) democratic participation, and d) good-natured/easy-going. Factors for Authoritarian were a) verbal hostility, b) corporal punishment, c) non-reasoning, punitive strategies, and corporal punishment. Permissive factors were a) lack of follow through, b) ignoring misbehavior, and c) self-confidence.

Aminabadi and Farahani showed a trend that children who required advanced behavior guidance strategies for restorative care tended to have permissive and authoritarian parents.[25] To our knowledge, parenting styles and temperament have not been studied with a parent's ability to predict a child's behavior in the dental setting. Our study evaluated the association of parenting styles of parents and temperament related to the parent's prediction of their child's behavior in the dental setting. We hypothesized that parenting styles and temperament significantly influenced children's behavior during dental procedures.

MATERIALS AND METHOD

An IRB-approved prospective study was conducted in the dental clinic at Cincinnati Children's Hospital Medical Center (CCHMC). A total of 113 patients were studied. Inclusion criteria were healthy (ASA I) patients, of either gender, English speaking, and emotionally and cognitively normal per parental input. For guidance with selection of parent/child dyad, the range in age of children was between 4 and 12 years. The medical history obtained from the parent was also cross-referenced with each child's medical history in the hospital chart to confirm the child's status of health and cognition. Exclusion criteria was any child with oral-facial swelling or dentally-related trauma. Pediatric dental residents or dental staff recruited patients who met the specific requirements for the study when presenting to the CCHMC dental clinic. The children's purpose for attending the clinic was for either a new/recall examination or planned restorative procedures. The pediatric dental resident or dental staff invited the patient's parent in a private area to voluntarily consider participation in the study. The pediatric dental resident obtained consent from the parent, who voluntarily agreed to participate in the study.

The parent provided demographic information, including household income, parental education level, marital status, and number of children. The parent of each patient also completed a PSDQ, which assessed the level of a parent's parenting style.[25] The parent completed the questionnaire on a computer using Google software, which was programmed to export parent's responses directly into an Excel spreadsheet. The PSDQ is a 62-item questionnaire for parents to indicate how often a listed behavior is used when interacting with their child.[25] The PSDQ scores evaluated the level of the parent's style based on Baumrind's initial parenting typologies: authoritative (high control, high warmth), authoritarian (high control, low warmth), and permissive (low control, high warmth). The response set ranged from 1 to 5 on a Likert-type scale representing "almost never" to "almost always," respectively. The authoritative scale of the PSDQ consists of 27 items, including warmth and involvement (11 items), reasoning/induction (7 items), democratic participation (5 items), and good-natured or easy-going (4 items). The authoritative scale range was from 0 to 120. The authoritarian scale has 20 items, including verbal hostility (4 items), directiveness (4 items), corporal punishment (6 items), and non-reasoning/punitive strategies (6 items). The authoritarian scale range was from 0 to 85. The permissive scale consists of 15 items and includes self-confidence (5 items), ignoring misbehavior (4 items), and lack of follow through (6 items). The permissive scale range was from 0 to 55. A summed score was calculated for each parent across all three scales of parenting styles. The higher a score was in a parenting style scale, the greater the parent's tendencies for that parenting style. The highest score on any given scale placed the parent in that corresponding parent category. The PSDQ can be used for preschool and school-age children.[25, 26] All participants were blind to the parenting style until after the appointment was completed.

The child's temperament was assessed before the procedure. The parent completed the EAS about their child on a computer screen using the Google software, as described above. The EAS contains 25 items about various child characteristics. Each item has a Likert-like scale ranging from 1 (not at all like my child) to 5 (very much like my child).[1, 2, 5, 27] For six of the EAS questions, the Likert-type scale is reverse (1 is very much like my child and 5 is not at all like my child).[1, 5, 6] The EAS is based on a three-factor model of temperament dimensions: emotionality (distress proneness), activity (behavioral arousal), and sociability (preference to being with others versus being alone).[1, 5, 27] Each dimension is measured by 5-item subscales, whose mean scores range from 1 to 5.[1, 2, 5, 6, 27] The EAS has shown internal consistency (M = 0.83), test-retest reliability (M = 0.70), and construct validity in children 1-9 years old across different cultures.[6]

Residents who had completed a minimum of three months of pediatric dental training with significant experience in the use of

the Frankl scale[28] (see Figure 1) helped complete this study. For purposes of inter-rater reliability of residents who assessed the behavior of children using the Frankl scale during dental procedures, ten videotapes of children receiving new/recall visits or restorative procedures were recorded and used for training. Three pediatric dental faculty evaluated each videotape independently and scored the children's behavior using the Frankl scale. To obtain consensus for each videotape, the faculty group met, discussed disagreements, and obtained 100 percent concordance for each videotape. Each resident reviewed and rated the patient's behavior on the videotapes using the Frankl scale and were required to obtain 90 percent reliability. Everyone was successful in attaining this goal.

Figure 1. Frankl Scale Used In This Study[28]

Definition	Score
Definitely negative: Patient refused treatment, was fearful, cried forcefully, or any other overt sign of extreme negativism	1
Negative: Uncooperative, reluctance to accept treatment, some negative attitude but not pronounced (i.e. sullen or withdrawn)	2
Positive: Acceptance of treatment, willingness to comply with the dentist, occasional cautious behavior, occasional reservation but willingness to follow the dentist's directions cooperatively	3
Definitely positive: Good rapport with the dentist, enjoying the situation, laughter, interested in the dental procedure	4

The residents performed the new/recall examinations and planned restorative procedure visits, rating each child's behavior with the Frankl scale at the end of the procedure. In this study, resident ratings were used as the definitive rating of the child's behavior. The new/recall visits and planned restorative procedures were performed, per clinic policy and protocols. The parent was present in the operatory while the child received care.

The parent was introduced to the Frankl scale and asked to predict their child's behavior prior to the start of the procedure, using the Frankl scale. To evaluate the parent's accuracy in predicting their child's behavior, a simple subtraction of Frankl scale categories of the parent's rating from the resident's rating resulted in a number. The distribution of numbers could range from 3 to -3. For example, if a resident gave the child a Frankl 4 rating and the parent gave a Frankl 3, this was a +1.00. The percent of parental accuracy was recorded (e.g., correct accuracy was the number of 0's in the distribution of numbers resulting from the subtraction process). Both parental predicted Frankl scale and percent accuracy of the behavioral predictions were used in the analysis.

The data collected via the electronic surveys were automatically exported to an Excel spreadsheet in a de-identified manner. In addition, the parent and resident Frankl ratings were recorded and added to the spreadsheet. The data in the spreadsheet was then imported to SPSS software (IBM, Version 20) for data analysis. Descriptive statistics, frequency counts, and cross-tabulations with chi square analysis were primarily used to analyze the data. Statistical significance was set *a priori* at $p < 0.05$.

RESULTS

Demographics

The study sample initially included 129 parent/child dyads. However, 16 were not the parent of the child; thus, the final sample included 113 parent/child dyads. More than half of the parents were 30-39 years of age (56.6%). There were 101 mothers and 12 fathers. The majority were not married (52.2%). A third of parents completed some college (32.7%) and 26.5% had a high school degree or equivalent. The majority of parents were employed full time (47.8%) with salaries ranging from $0-25,000 (54.9%). At least 80.5% of the parent population has federal assistance (e.g. Medicaid). The majority of parents (43.4%) had two children and 20.4% had three children. A demographic summary is shown in Table 1.

Table 1. Parent Demographic Information

		Number	%
Mothers		101	89
Fathers		12	11
Marital status	Not married	59	52.2%
	Married	35	31.0%
	Widowed	3	2.7%
	Divorced	12	10.6%
	Separated	4	3.5%
Employment status	Employed Full time	54	47.8%
	Employed part time	21	18.6%
	Unemployed	33	29.2%
	Retired	1	0.9%
	Unable to work	4	3.5%
Estimated house income	$0-25,000	62	54.9%
	$25,000-50,000	38	33.6%
	$50,000-75,000	5	4.4%
	$75,000-100,000	6	5.3%
	> $100,000	2	1.8%
Insurance status	Federal assistance	91	80.5%
	Financial aid through the hospital	16	14.2%
	Private insurance no Insurance	6	5.3%
Educational status	No high school degree	7	6.2%
	High school degree or equivalent	30	26.5%
	College degree	8	5.3%
	Some college	37	32.7%
	Associate degree	15	13.3%
	Bachelor degree	9	8.0%
	Graduate degree	9	8.0%

Behavior

The distribution of the parent's prediction of behavior using Frankl categories was skewed toward positive behaviors with only 3.5% and 0.9% of children predicted as negative and definitely negative, respectively. In terms of accuracy of parental predicted behavior, 57.5% of parents were accurate in their predictions of

behavior. Table 2 shows the distributions of those results. None of the demographic information, including type of visit, was associated with the parent's prediction or accuracy of predicted behavior. The parent's predicted behavior score was correlated with actual behavior ($r = .488$, $p < 0.001$).

Table 2. Parental predicted behavior, actual behavior, and accuracy of predicted behavior.

		Number	%
Parent's prediction of behavior	Definitely negative	1	0.9%
	Negative	4	3.5%
	Positive	55	48.7%
	Definitely positive	53	46.9%
Resident's rating of behavior	Definitely negative	2	1.8%
	Negative	16	14.2%
	Positive	34	30.1%
	Definitely positive	61	54.0%
Prediction outcome	Correct Prediction	65	57.5%
	Predicted child better than actual	25	22.1%
	Predicted child worse than actual	23	20.4%

Parenting Styles

The mean global scores for each parental style scale were: 115.0 ± 9.4, 40.3± 8.1, and 36.3 ± 4.8 for authoritative, authoritarian, and permissive, respectively. Positive and negative significant associations between Authoritarian and Permissive ($r = .379$, $p < 0.001$) and Authoritative and Authoritarian ($r = -.366$, $p < 0.001$) parenting characteristics were observed with this group of parents, respectively.

Temperament

The mean scores for the temperament subscales were: 2.2 ± 1.0, 2.8 ± 0.9, 3.9 ± 0.6, and 2.2 ± 1.0 for emotionality, activity, sociability, and shyness, respectively. Significant associations were also noted among temperament characteristics of the children: Emotionality was associated with Shyness ($r = .440$, $p < 0.001$), and Shyness with Sociability ($r = -.221$, $p < 0.02$). Temperament, but not parenting characteristics, was moderately associated with parental predictions of behavior in the operatory: Emotionality ($r = -.497$, $p < 0.001$), Activity ($r = -.217$, $p < 0.009$), and Shyness with parent prediction ($r = -.282$, $P < 0.002$), respectively. Regression analysis indicated emotionality, activity, and authoritarian characteristics predicted the parent's prediction of their child's behavior (Betas = -.484, $p < 0.001$; -.183, $p < 0.016$; and .327, $p < .228$, $p < 0.001$, respectively).

Significant correlations were found between actual behavior (based on the resident-determined Frankl rating) and emotionality ($r = -.586$, $p < 0.001$), activity ($r = -.196$, $p < 0.03$), and shyness ($r = -.281$, $p < 0.003$), but not with parenting styles. However, a mild association was noted between parental prediction of behavior and one factor of parenting style: "non-reasoning, punitive strategies" ($r = .200$, $p < 0.03$). Correlations of significant associations for the study are shown in Table 3.

Table 3. Significant correlations noted among main variables in the study

Areas of Interest	Associated items	r	Probability
Behavior	Parent's predicted behavior with actual behavior	.488	0.001
Parenting styles	Authoritarian with Permissive	.379	0.001
	Authoritative with Authoritarian	-.366	0.001
	Parent prediction with "non-reasoning, punitive strategies"	.200	0.03
Temperament	Emotionality with shyness	.440	0.001
	Shyness with sociability	-.221	0.02
	Parent prediction with emotionality	-.497	0.001
	Parent prediction with Activity	-.217	0.009
	Parent prediction with shyness	-.282	0.002
	Actual behavior with emotionality	-.586	0.001
	Actual behavior with activity	-.196	0.03
	Actual behavior with shyness	-.281	0.003

A stepwise regression analysis using individual questions from the PSDQ and EAS predicting the parent's prediction of behavior was completed. The result indicated a model of eight items that were significantly predictive of the parent's prediction of behavior with four from the PSDQ and four from the EAS. The PSDQ items were a) show sympathy when my child is hurt or frustrated, b) punish by taking privileges away from my child with little if any explanations, c) talk it over and reason with my child when the child misbehaves, and d) take my child's desires into account before asking the child to do something. Several questions approached significance (i.e., ≤ 0.08), including encourage child to talk about his/her troubles, allow my child to annoy someone else, state punishments to my child and do not actually do them, tell my child what to do, bribe my child with rewards to bring about compliance, and use threats as punishment with little or no justification. The EAS items were a) my child will love working with you, b) my child will move around a lot, c) my child will like the dental staff, and d) my child will want to get out of the dental chair.

DISCUSSION

We investigated the relationships among parenting styles, child temperament, as well as parental prediction of behavior during dental procedures. This sample included mothers and fathers of children who were seen in our dental clinic for examinations or restorative visits. There were no significant differences in distribution of parental predictions as a function of types of appointments; therefore the data was pooled across appointment types. Parents were accurate in their predictions using the Frankl scale 57.5% of the time. Corroborating this was a modest association between parent's prediction of behavior and the actual observed behavior.

Parents are the most important source of information regarding their child's emotional and behavioral problems.[22] One might expect that parents are good predictors of their child's behaviors in a variety of settings. Parents in this study were accurate 57.5% of the time in their predictions of their child's behavior during dental procedures. On face value, one might have expected a higher percentage of predictive accuracy of parents than was found. However, there may be several factors that account for a lower than expected prediction accuracy. For example, the parents were asked to predict behavior based on a scale (Frankl) with which they were unfamiliar prior to participating in the study. On the one hand, the Frankl scale may be too broad to capture more intimate details of behavior with which the parent is likely to otherwise use in assessing their child's behavior. This shortcoming has been suggested previously.[29] On the other hand, the Frankl scale is a relatively easy tool for rating behavior and may be easily assimilated into the perceptional foundations of parents when assessing their children's behaviors. Further study of this issue is suggested. Also, predicting behavior for parents in an environmental setting that is not experienced on a daily or frequent basis may be more challenging than settings in which parents are quite familiar and witness their children's behavior regularly. Other factors, such as personal attitudes and experiences associated with dentistry, sampling bias (e.g., families in this study tended to fall into lower socioeconomic categories), and parental motivation, may be related to those who agreed to participation in the task. Nonetheless, we contend and are supported by this study, albeit minimally, that the process of asking parents to predict their child's behavior in the dental setting may be useful in practice. For certain, this process will provide a quick indication as to what behavior to expect by the patient.

Our findings indicated a positive association between global domains of authoritarian and permissive parenting in this sample. Authoritarian parents tend to be high control and low warmth, while permissive parents tend to be low control and high warmth.[25] Although our finding may seem puzzling, one interpretation of this association may be a function of inconsistency in parenting wherein daily life stresses of this lower socioeconomic parent sample may contribute to factors inherent in each of these parenting styles. We did not measure stress levels in parents; however, this interpretation indirectly supports the findings of others.[30] Furthermore, our findings also are not inconsistent with Aminabadi *et al,* who showed children exhibit uncooperative behavior if their parent is permissive or authoritarian.[25] Our findings of a negative association between authoritative and authoritarian parenting styles are consistent with prior findings and our interpretation that authoritative parents have children with cooperative behavior, unlike authoritarian parents' children.[25, 31] Authoritarian parents purportedly have children who exhibit fewer behavioral problems, but were less competent and prosocial than children from authoritative homes.[32] Some have shown that children who exhibit more positive behaviors tend to be associated with authoritative parenting styles compared to those who have authoritarian or permissive parenting styles.[33]

Although no significant association was noted between parenting global scores to either predicted or actual behaviors, some sub-categories of the PSDQ were mildly associated with parental predictions of behavior. Possibly, future studies involving the use of the PSDQ may wish to use not only global scores, but also sub-categories in their analysis of children's behavior in clinical settings.

In a Swedish study, negative emotionality was the most predictive value of dental behavior management problems (DBMP) after dental fear, and correlated positively with impulsivity.[1, 27] Our findings found that emotionality was positively associated with activity and shyness. This is consistent with our prior knowledge that an active or shy child will tend to be more distress prone and that these temperamental traits have a predictive value of DBMP.[1-3, 7, 27] Another finding was that shy children had a negative association with sociability, which seems plausible. The children who ranked higher on the emotionality scale were predicted to have worse behavior by their parent. This was similar in the children who ranked higher on the activity scale. As the behavior was predicted to be more positive, the scores for emotionality, activity, and shyness all decreased. Recognizing that a child's behavioral disturbance is related to his or her temperament can help the clinician set realistic goals for intervention efforts.[9]

We focused on analyzing predicted behavior with specific global measures of parenting and temperament. That is, we used the mean scores of the PSDQ and its sub-categories, as well as the mean scores of the EAS domains, which had mediocre associations. However, a regression analysis using each of the questions related to parenting and temperament indicated some questions were important predictors of parent's predictions. Several individual questions from both questionnaires were apparently predictive of the parent's indication of how their child may react during a dental visit. We would suggest that any future dental studies using the EAS and PSDQ, along with a behavioral scale that captures more incidences of specific behaviors, may find more useful information in the details of the questionnaires rather than in an average score of all questions. This may better elucidate the influence of temperament and parenting factors in the dental setting.

Limitations

There were limitations in our study that may have influenced the outcome of the study. One limitation was the sample itself, for reasons described above, that may have been skewed toward well-behaving children with less likelihood of diversity in temperament qualities. Similarly, the parents' parenting styles were also less likely to be a diverse sample. With respect to the temperament results, the EAS has been validated for children 1-9 years old; our study population included 4-12 year olds and other studies have studied children up to 15 years of age with the EAS.[34] Another limitation is that patient gender was not recorded and this demographic characteristic has been shown to be associated with behavioral responses to dental procedures. Boys have disruptive behavior problems more commonly than girls.[22] The age was also not recorded; however, there is no chronologic age or IQ level, which distinctly separates the children into those who accept and those who do not accept dental care.[35] It may have been enlightening to have the parent rate themselves in terms of parenting styles as defined in this study to compare to their actual parenting style as determined from the PSDQ. Finally, parents' use of the Frankl scale may be a methodological issue of concern, but its simplicity seemed appropriate for the task requested of the parent in this study. Use of a behavior rating scale that is a continuous metric (e.g., Ohio State Behavior Rating Scale) may have revealed more subtle differentiations in behavior, possibly reflecting the influence of the interaction

between parenting styles and temperament qualities. Nonetheless, a much larger sample number is likely necessary to reveal such an interaction, should it exist.

The application of this study for pediatric dentists is to have parents of children in their practice complete a version of the temperament and parenting styles questionnaires. A future study to create an abbreviated version of the PSDQ would be beneficial since the greatest inhibitor of this study was the number of questions in the PSDQ. However, we used the entire 62-item PSDQ because of its validation by Robinson.[24] The innovative approach to questionnaires used in this study will help streamline the process. We recommend pediatric dentists use the Google software system using Excel to capture their input into a spreadsheet format. It automatically does the calculations enabling the dentist to see which parenting style the parent exhibits and the child's temperament traits as soon as the questionnaires are completed. This will allow dentists to utilize parenting style and temperament to create a behavior management plan and determine if a pharmacologic approach is indicated for dental treatment.

CONCLUSIONS

1. The parent's prediction of their child's behavior during a dental appointment may be worthwhile information for practitioners to obtain prior to dental visits.
2. Temperament qualities of emotionality and shyness appear to be valuable indices of behavior in the dental setting.
3. Further study is necessary to unravel definitive threads of association between refined aspects of parenting styles and child temperament in predicting child behavior in the dental setting.

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