

Acceptance of Behavior Guidance Techniques Used in Pediatric Dentistry by Parents from Diverse Backgrounds

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Abstract

Objective: To investigate if parental background affects acceptance of behavior guidance techniques.

Background: Behavior guidance techniques are used for the safe and effective treatment of pediatric patients. Acceptance of these techniques may vary by racial and ethnic background.

Methods: 142 parents were recruited and asked to rate videos showing: active restraint/protective stabilization (AR), general anesthesia (GA), nitrous oxide sedation (N₂O), oral premedication/sedation (OP), passive restraint/protective stabilization (PR), tell-show-do (TSD), and voice control (VC) techniques.

Results: Hispanic parents rated VC most acceptable, followed by TSD, PR, and pharmacologic techniques. Black and white parents rated TSD, followed by N₂O, as most acceptable, and AR and PR as least favorable. Hispanics found GA significantly less acceptable than whites or blacks. Hispanics were less accepting of AR than blacks; but more accepting of PR than whites. TSD was highly rated among all three cohorts. Parental background affected acceptance of the techniques in this study.

Background

Behavior guidance is the American Academy of Pediatric Dentistry's (AAPD) term describing the interaction between a child, the child's family, and a health care professional in a clinical setting when striving to achieve safe and effective dental education and treatment. Minimizing a child's fear and anxiety is an important factor in providing successful treatment¹. Successful treatment requires that behavior guidance techniques be tailored to each specific child, the family, and the child's dental experience². Successful behavior guidance selection and employment can aid achievement of successful dental disease treatment and prevention, thereby creating a positive dental experience for child, parent, and dentist¹.

A survey inquiring about the use of thirteen different guidance techniques by pediatric dentists indicated they employ a range of techniques³. However, basic behavior guidance techniques, especially communicative ones, tend to be the most successful and widely used⁴. Nitrous oxide/oxygen gas inhalation is also considered a basic behavior guidance technique because of its safe and effective capability for anxiolysis¹. Its use is reported as increasing with younger pediatric dentists⁵. In some cases, advanced measures are needed when treating children who are non-compliant due to negative behavior or fear¹.

Advanced behavior guidance techniques are considered higher risk and therefore require advanced training and informed consent from a parent or legal guardian. Advanced techniques include pharmacologic intervention and protective stabilization, which has been known as active or passive restraint¹. Protective stabilization with a Papoose Board has been shown to garner positive attitudes towards its use by mothers whose children have required the technique⁶. Some younger pediatric dentists predict use of protective stabilization will decline in the future³.

Pharmacologic behavior management techniques are also considered advanced. Within this pharmacologic continuum, AAPD member dentists prefer general anesthesia most frequently

followed by conscious sedation⁴⁻⁵. The most common pharmacologic interventions used globally by dentists treating children were general anesthesia, followed by nitrous oxide/oxygen, sedation via oral route, sedation via intravenous route, and sedation via other routes, respectively⁷.

Having such a variety of behavior guidance techniques available allows treatment to be individualized for each patient. Many factors contribute to the selection of behavior guidance techniques. One panel report suggests that post-doctoral students should receive training, with respect to behavior guidance selection, in family dynamics and advocacy, parenting, and multiculturalism among other things⁸. Another report states more simply that the “appropriateness” of a behavior guidance technique is based upon effectiveness and social validity². Medical sociologists suggest a shift in the health care industry toward a consumerist approach leading to dental treatment increasingly becoming a decision-making process between dentist, parent (and potentially other family members), and insurer. Multicultural influence on health beliefs, in addition to societal changes in parenting, reflect complications that dentists face when deciding treatment approaches for children⁹. All of these complex factors must be considered when treating a child in the dental setting and how a management plan will be accepted.

Parental acceptance of behavior guidance techniques is an important part of successful dental treatment of pediatric patients as well as for any other specialties that may benefit from the use of these techniques. Multiple studies have investigated what guidance techniques are accepted by parents for their children, and what factors determine parental attitudes. These studies have shown highly variable results ranging from all presented behavior guidance techniques having some degree of parental acceptance¹⁰ to no technique having universal acceptance¹¹⁻¹². The data also suggest a definite continuum of parental acceptance where the

least aggressive, communicative guidance techniques are most accepted, while more aggressive techniques involving restraint or pharmacologic intervention are rated less acceptable¹¹⁻¹⁶.

Recent studies have found parents are more accepting of pharmacologic techniques than in the past¹⁷.

Multiple studies have shown that a thorough explanation of proposed techniques is one factor that greatly affects parental acceptance, where prior explanation leads to greater acceptance^{10-11, 14, 18}. Several studies have concluded that while socio-economic status (SES) seems to affect parental acceptance; it was only partly responsible in determining acceptance^{10, 16, 18-19}. Conversely, Eaton et al.¹⁷ found, with a middle class sample of parents, that parental age, gender, education level, and social status have no correlation with parental acceptance.

Behavior guidance acceptance has not been specifically compared across parents of diverse backgrounds; afforded by ethnicity or race of the parents. When comparing across similar studies that have surveyed parental behavior guidance acceptance in countries other than the United States some discrepancies have been found. With respect to such comparisons, it seems that cultural background may play a role in parental acceptance patterns of behavior guidance. Moreover, several social science articles suggest that cultural background may play a role in parenting style, which could extrapolate to differences in parental acceptance of behavior guidance methods²⁰⁻²¹.

Previous literature on parental acceptance of behavior management techniques calls for ongoing research to accommodate societal change²². The purpose of this study is to determine if parental ethnic/racial background affects parental acceptance of common behavior guidance techniques used in pediatric dentistry. The study results can provide insight to current parental acceptance patterns of common behavior guidance techniques leading to improved

communication between dentist and parent/child, and increased compliance with pediatric dental care.

Materials and Methods

Prior to initiation of this study, Indiana University-Purdue University Indianapolis (IUPUI) Institutional Review Board (IRB) approval was obtained. A video tape developed by Lawrence et al.¹⁰, that has been used in multiple similar studies^{11, 13, 17, 19}, was digitized and loaded onto a tablet device (Apple iPad or Microsoft Surface) for viewing. The videos consisted of eight vignettes, including an introduction to the concept of behavior guidance in addition to an explanation and example of the following seven behavior guidance techniques: active restraint (AR), general anesthesia (GA), nitrous oxide sedation (N₂O), oral premedication/sedation (OP), passive restraint (PR) with a Papoose Board[®], tell-show-do (TSD), and voice control (VC). Hand-over-mouth was omitted from this study due to its omission from the AAPD behavior guidance guidelines.¹ Video vignettes were also translated to Spanish with voice-over, using a process of translation and back translation to ensure content equivalency, as an option for Spanish-speaking parents.

Study Subjects Recruitment

One hundred forty-two subjects were recruited from community centers in Indianapolis, Indiana, USA, as well as from the Indiana University School of Dentistry's Oral Health Research Institute. Participation required that subjects be parents of a child under age eighteen, be over age eighteen themselves, and be of Hispanic ethnicity, non-Hispanic Black or White. Interested subjects were read a recruitment script explaining a brief study description and were verified to be a parent and be over age 18 at the time. If interested in participation parents were individually presented with an IRB approved study information sheet, which was summarized by a trained

investigator and discussed with each participant to his or her satisfaction, to explain the nature of the study and the risks/benefits involved. Subjects with continued interest were invited into a private area and asked to complete a demographic information questionnaire asking parents to indicate ethnicity, race, age, gender, family income, and highest completed education level. The demographic questions and the corresponding variable definitions were derived from multiple sources including the U.S. Dept. of Health and Human Services²³ website and “The Impact of Immigration on Indiana”²⁴ briefing papers. Subjects that did not fit the inclusion criteria were still invited to participate but were informed that their results likely would not be used in the study.

Recruitment procedures differed from previous similar studies. We recruited from neutral sites in Indianapolis instead of recruiting from dental offices where specific behavior guidance techniques might be used more often than others might. Moreover, we aimed for balanced enrollment across the three study cohorts. The IUPUI Polis Center was consulted to help determine recruitment strategy using geospatial data. Recruitment sites were selected based on the greatest representation of subjects that would fulfill our target population while controlling for covariates surveyed for in the study. Census tract counts, based on the 2010 US Census Bureau, for each covariate were cross-referenced with community center data obtained from the SAVI website, a community information database, to identify which community centers would be used for participant recruitment. SAVI is a free resource that helps the community, including public policymakers and researchers, make data-informed decisions. It provides data about Central Indiana communities, tools to analyze and visualize the data, and training to build your capacity to use it effectively. We aimed to recruit between 160 and 210 subjects to produce a

power of between 80 and 90 with a mean effect difference in acceptance across race/ethnicity of approximately 15 points on the VAS.

Behavior Guidance Vignettes and Visual Analogue Scale

Consented subjects were asked to view the series of seven behavior guidance vignettes, shown in randomized order, and were asked to rate each technique immediately after each vignette on a visual analogue scale (VAS). Each subject participated in the study individually to eliminate bias between subjects. The VAS used was similar to that used in previous studies where a 100 mm horizontal line was paired with each technique^{10-11, 17, 19}. The left end of the line was labeled completely acceptable and corresponds with 0 on the numerical scale, while the right end of the line was labeled completely unacceptable and corresponds with 100 on the scale. Each subject was asked to make a vertical line crossing the VAS representing his or her subjective acceptance level of each technique. A numerical value was established by measuring each cross-mark with a ruler to the nearest 0.5 mm. The data were compiled and analyzed.

Statistical Analysis

Statistical analyses of recruitment, as well as results, were completed using OpenEpi version 2.3.1. A one-way analysis of variance (one-way ANOVA) test was used, and a posthoc Tukey-HSD test was used to compare acceptance results across study groups. The main study demographic categories (gender, age, education level, and family income) were analyzed for equal proportions between the three study cohorts using a chi-squared analysis. Means and standard deviations with 95% confidence intervals were calculated for each technique from each study group.

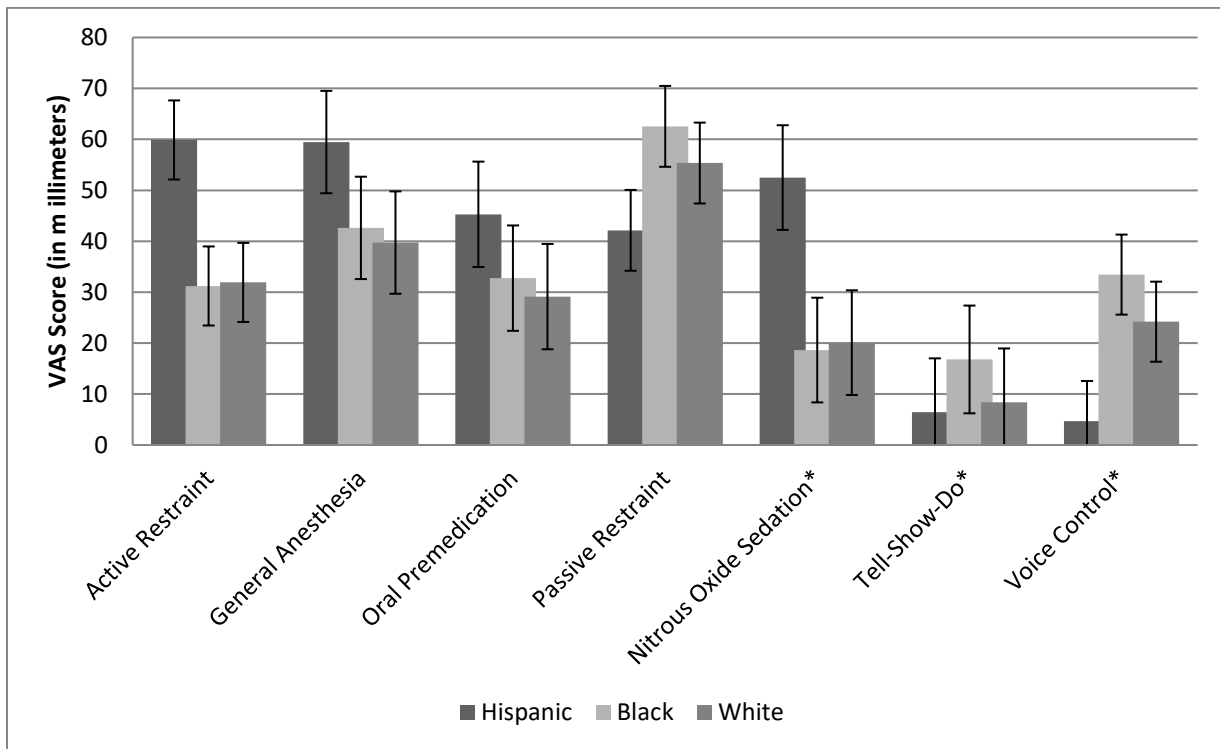
Results

A total of 142 subjects were recruited to participate in the study, one of which was excluded because she did not belong to any of our three study cohorts, leaving us with 141 surveys. Sixty-two of the 141 surveyed parents were Hispanic, 40 were non-Hispanic white, and 39 were non-Hispanic black. Based on the results of the analysis of the main demographic categories, exclusions were made from the 141 surveys. Two parental responses were excluded because their gender was not recorded, and three responses were excluded because the subjects were over 50 causing an age proportion difference between study groups. No exclusions were made based on education level or income proportions. Considering exclusions, 136 parental responses were used for analysis. The three study cohorts were considered proportionate ($p > 0.05$) across groups for gender ($p = 0.92$), age ($p = 0.75$), and income ($p = 0.52$); however, education level ($p = 0.0002$) did vary in proportion across study groups creating one limitation to this study. Table 1 shows a demographic breakdown of our study population with exclusions.

Means and standard deviations with 95% confidence intervals, for each technique from each study group, are shown in Table 2 and Figure 1, respectively. Analysis of included responses with the ANOVA and posthoc Tukey-HSD tests yielded statistical differences ($p < 0.05$) between the three study cohorts for four of the seven surveyed behavior guidance techniques. Results for active restraint (F-statistic: 5.83, $p = 0.004$), general anesthesia (F-statistic: 14.49, $p = 2.03E^{-6}$), nitrous oxide sedation (F-statistic: 24.75, $p = 7.26E^{-10}$), oral premedication/sedation (F-statistic: 3.73, $p = 0.03$), passive restraint (F-statistic: 5.24, $p = 0.006$), and voice control (F-statistic: 23.39, $p = 1.78E^{-11}$) all suggest that differences among the study groups exist with acceptance levels of these techniques. However, we can only accept these results, based on the equality of variance ($p > 0.05$) test results, for active restraint, general anesthesia, oral premedication/sedation, and passive restraint ($p = 0.35, 0.69, 0.62, \text{ and } 0.57$

respectively). However, the post-hoc Tukey test failed to show differences between any of the three groups for oral premedication/sedation. Other comparisons among study groups showed that acceptance was statistically different between Hispanic and Non-Hispanic white participants for general anesthesia and passive restraint where Hispanic parents are more accepting of passive restraint but less accepting of general anesthesia. Statistical differences exist between non-Hispanic black and Hispanic parents for active restraint and general anesthesia where Hispanic parents are less accepting of both techniques. No differences existed between non-Hispanic white and non-Hispanic black parents.

Figure 1. VAS Scores for Parental Acceptance of Pediatric Methods. A value of 0 indicates parents found the technique completely acceptable, while a value of 100 indicates they found it completely unacceptable.



* indicates ANOVA results were not substantiated with equality of variance test.

Significant differences were not found for nitrous oxide sedation, tell-show-do, and voice control; however, differences may exist that are non-parametric in nature and would require further study to validate. Interestingly, the results for these techniques suggest that Hispanic parents may display greater acceptance of voice control and less acceptance of nitrous oxide sedation than do non-Hispanic white and black parents.

Table 3 shows the rank order of the behavior guidance techniques surveyed for in our study compared to the order of the same or similarly labeled techniques (non-similar techniques were omitted for purposes of comparison) surveyed for in other studies conducted in different geographic areas.

Discussion

No previous studies were found to investigate behavior guidance acceptance specifically by parents of differing backgrounds; so, direct comparisons to our study results are not possible. The results of this study show that parental background does play a role in acceptance of common behavior guidance methods. Tell-show-do has been the most widely accepted technique among previous studies. This trend held true for both the black and white non-Hispanic parents in this study; but Hispanic parents actually rated voice control as the most accepted technique with TSD ranking second. Hispanic parents tended to prefer non-pharmacologic over pharmacologic techniques contrasting, data from some recent similar studies. Comparatively, non-Hispanic black and white parents seem to mimic the recent data, as nitrous oxide sedation was preferable second. These groups also favored all pharmacologic techniques to either type of restraint surveyed for in our study.

Previous studies surveying for parental acceptance have used the 50 score as the center point on the VAS to arbitrarily represent the borderline of acceptability versus non-acceptability of a technique. Considering this point with respect to this study, both white and black parents accepted all techniques except for passive restraint, while Hispanic parents were non-accepting of three techniques including active restraint, general anesthesia, and nitrous oxide sedation. Hispanic parents also accepted passive restraint unlike the other study groups.

Although previous studies have not selected subjects distinguishing parental background, cautious comparison of previous study results can be done. When comparing across such studies discrepancies are found. Spanish parents were more likely to accept voice control and active restraint over pharmacologic based techniques, even nitrous oxide/oxygen inhalation¹³. A Kuwaiti sample of parents accepted voice control more readily than any pharmacologic technique; and physical restraint was more accepted than both general anesthesia and conscious sedation¹⁵. These trends generally coincide with Hispanic parental preferences in our study. Alternatively, previous results show U.S. parents, even Hispanic parents, generally favor pharmacologic techniques over voice control and restraint^{11, 17}. These trends are similar to those found for both non-Hispanic white and black parents, but contradictory trends for Hispanic parents in this study. Another perspective is that both Saudi and Indian parents rated voice control as the least accepted technique (except hand over mouth)^{18, 25}. The discrepancies found when comparing parental acceptance trends among different cultural groups, suggests, like our study, that parental background is a factor in parental acceptance of behavior guidance techniques.

Interestingly, the results of Hispanic parents in our study deviate from that of Hispanic parents surveyed in the Scott and Garcia-Godoy study¹¹. Differences in parenting styles among

parents of differing backgrounds may lend explanation to this finding. Cardona et al. report, in a survey of Hispanic and Anglo-American mothers of young children, that Hispanic mothers indicated a greater level of discipline in parenting than did Anglo-American mothers while Anglo-American mothers scored higher in the nurturing category than did Hispanic mothers²⁰. Further, Varela et al. found that parents of different backgrounds show differences in parenting styles²¹. Their study found that White non-Hispanic parents reported less authoritarian parenting styles than Mexican-American parents, but similar styles to Mexican parents. They also found that Mexican-American, and Mexican immigrant parents in the U.S. both reported more authoritarian parenting styles than did Mexican parents. Varela et al. suggest that minority status, with respect to greater society, may play a larger role in parenting style than affiliation with Mexican culture. Still, these differences suggest that parental background does play a role in parenting style. These parenting style differences may also suggest that parents of different backgrounds may feel differently about what techniques are used with their children in the dental setting.

American pediatric dentists have suggested that negative parenting changes have occurred during their careers causing a shift from using more assertive behavior guidance techniques to using less assertive ones²⁶. It is also noted that while multiculturalism influences informed consent and health beliefs, dentists may be unaware of these differences⁹. As society evolves, it is important to grasp attitudes of parents toward behavior guidance techniques because this can lead to more effective dental treatment for children.

This study has limitations. The video segments that were used in this study were chosen because they have been used previously by several studies. However, while all of the techniques demonstrated continue to be endorsed in the AAPD behavior guidance guidelines, there were

some other techniques, included in the guidelines for which we there are no videos. These techniques include: Positive pre-visit imagery, Direct observation, Ask-tell-ask, Nonverbal communication, Positive reinforcement and descriptive praise, Distraction, Memory restructuring and Parental presence/absence. We failed to achieve the initial target number of participants of 160, which was based on the initial power calculation. A larger sample size would have been favorable. We also aimed to achieve equal numbers of participants for each of our study cohorts with a non-statistical difference among the confounding variables we were trying to control for. We were able to eliminate differences between the three study groups for age, gender, and family income; however, we were not able to do so for education level. Another limitation of the study was that three surveyors participated in the data collection opening the door to human error among an already survey-based study, which could lead to error based in subjectivity. One other factor to consider when surveying parents on their acceptance of techniques would be to consider prior experience with such techniques. We did ask parents about this; however, the results were incomplete, because many times because parents did not know details of or remember previous dental appointments.

Conclusions

1. Differences in acceptance of behavior management techniques exist between Hispanic, non-Hispanic white, and non-Hispanic black parents, which suggest that practitioners should take into account cultural differences when electing to use them.
2. These differences were reported for both basic and advanced behavior management techniques, including general anesthesia, passive restraint, and active restraint.
3. The basic tell-show-do technique was highly accepted among all three study groups, and should be part of the trusted tools for practicing dentists.

4. While these results were derived from a dental setting, they should be helpful to pediatric practices in other specialties that employ similar techniques.

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Declaration of Conflicting Interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

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