

Background

- Self-recognition response develops between 15-24 months of age.²
- Self-awareness unfolds from birth to 4-5 years of age.⁴
- Unattractive 4- to 6-year-old children are relatively less popular and exhibit antisocial behaviors more frequently than attractive children, while attractive children are perceived as more self-sufficient and independent in behavior than unattractive children.⁴

Table 1: Philippe Rochat's Five Levels of Self-Awareness³

Level	Age	Description
0	0	Confusion: absence of self-awareness
1	1	Self: world differentiation - reflection in mirror is unique from surrounding environment
2	2	Situation: child is aware that what is seen in the mirror is unique to self
3	3	Identification: recognition that what is in the mirror is "me"
4	4	Permanence: identification of the self as an entity that is invariant over time and appearance changes
5	5	Self-consciousness: concern for how they are perceived by others

- The effect of facial differences has been shown to decrease with age, as older children may be more sensitive to the needs of others and more likely to be driven by moral ideals.⁵
- Silver diamine fluoride (SDF), stainless steel crowns (SSCs), and extractions are common treatments in pediatric dentistry that greatly impact the appearance of a child's smile.
- Limited studies have investigated the self and social perception regarding dental aesthetics, especially in children, including a pilot study completed at Penn Dental Medicine in 2021.

Purpose

To determine if children under the age of 6 are cognizant of changes in their appearance as it relates to smile aesthetics and to explore parental perception of unaesthetic dental treatment in children.

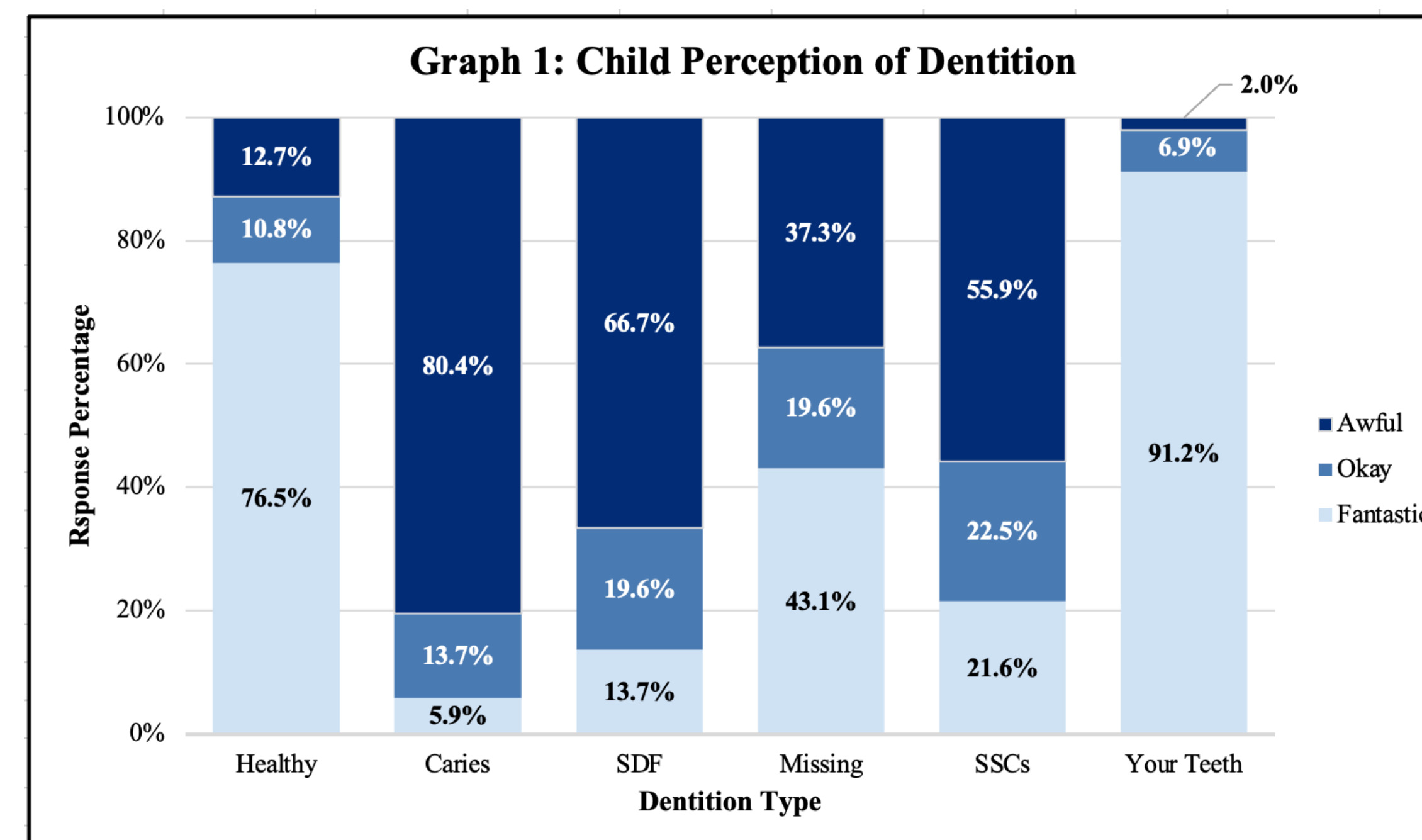
Methods

1. The study protocol was approved by the University of Pennsylvania Institution Review Board.
2. A photo survey was given to parents and ASA 1 children less than 6 years of age with and without a history of unaesthetic dental treatment.
 - The survey consisted of 5 photographs depicting the same mouth modified with decayed teeth, missing teeth, teeth treated with SDF, or teeth restored with SSCs.
 - For the child survey, answer choices were formatted according to the Likert Scale of Faces: very happy (fantastic), neutral (okay), and very sad (awful) faces.
3. Parents of children who received unaesthetic dental treatment were asked to complete an additional survey asking about the social experiences of their child as well as their feelings towards treatment outcomes.
4. The statistical analysis included likelihood ratio tests, cumulative logistic regressions with ordinal responses, Fischer's exact tests, and McNemar's tests.

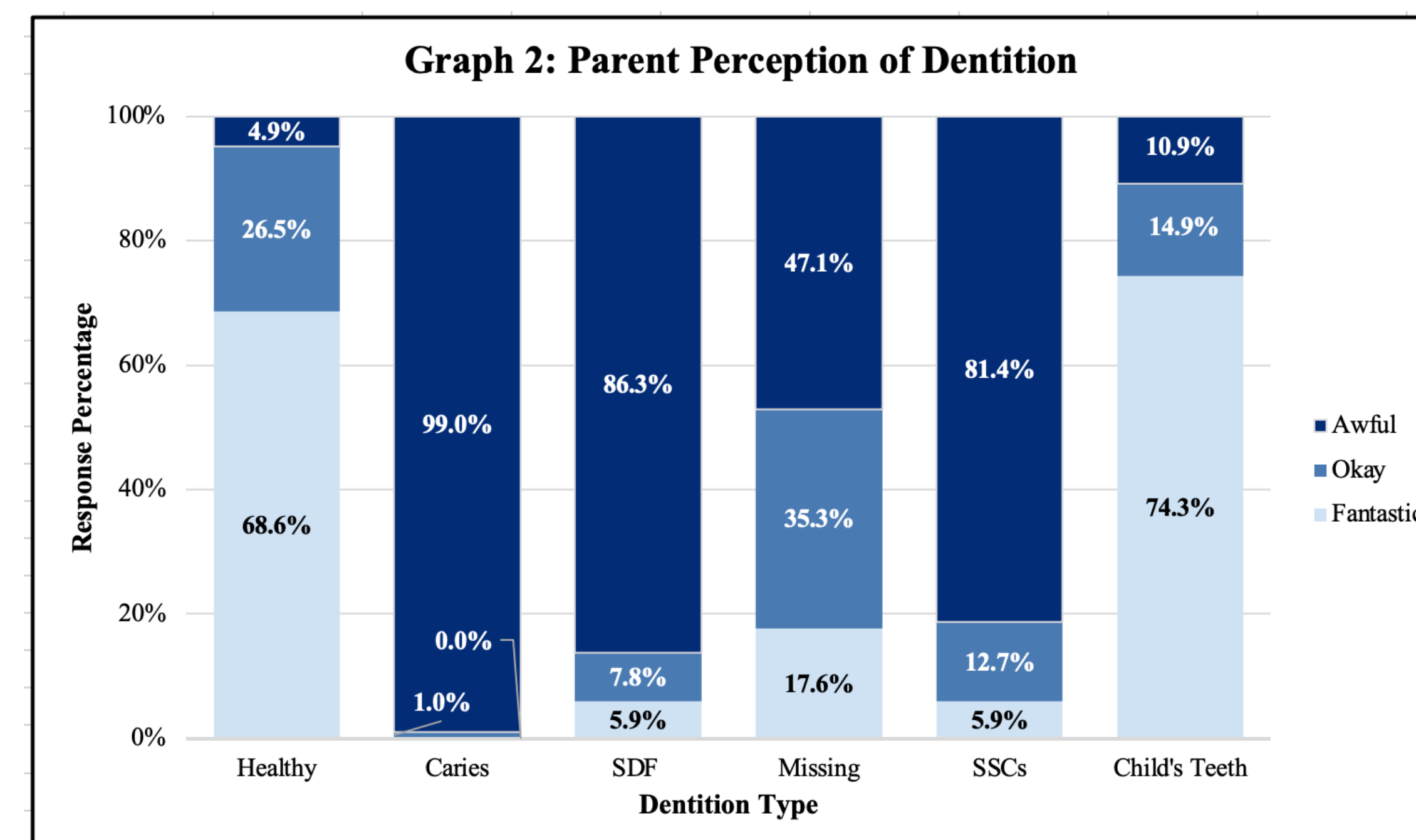


Results

- 112 parent - child duos were surveyed. 10 data pairs were excluded due to incomplete responses.
 - 52 children had healthy teeth and 50 children had treated teeth.
- Participating children were 2 years old (2%), 3 years old (25%), 4 years old (46%), and 5 years old (27%).
- 21.57% of children had private insurance, 77.45% had medicaid insurance, and 0.98% had no insurance.



- **Children disliked the appearance of caries the most, followed by SDF, SSCs, and missing teeth.**
- Age ($p = 0.531$), history of dental treatment ($p = 0.611$), and insurance type ($p = 0.885$) are not significant predictors of how children under 6 years old feel when they look at their own mouth.
- For children with treated teeth, the odds of feeling fantastic (versus okay or awful) is 0.69 compared to those with healthy teeth.



- **Parents disliked the appearance of caries the most, followed by SDF, SSCs, and missing teeth.**
- History of dental treatment ($p = 0.001^*$) is a significant predictor of how parents feel when they look at their child's mouth, whereas child's age ($p = 0.183$) and insurance type ($p = 0.608$) are not.

Table 2: Fisher's Exact Test P-Values - Child's History of Dental Treatment and Rating of Dentition

	Healthy	Caries	SDF	Missing	SSCs	Child's Teeth
Parent	0.085	1	0.017*	0.699	0.026*	0.001*
Child	0.788	0.103	0.304	0.356	0.744	0.855

- There is no significant difference between children's history of dental treatment and how they feel regarding healthy teeth ($p = 0.788$), caries ($p = 0.103$), SDF ($p = 0.304$), missing teeth ($p = 0.356$), SSCs ($p = 0.744$), and their own teeth ($p = 0.855$).
- There is a significant association between parents' survey response and their child's dental history with respect to SDF ($p = 0.017^*$), SSCs ($p = 0.026^*$), and their child's teeth ($p = 0.001^*$).
 - No significant association was noted with respect to healthy teeth ($p = 0.085$), caries ($p = 1$), and missing teeth ($p = 0.699$).
- **Parents of children with healthy teeth are more likely to rate their child's dentition highly.**
- **Both parents of children with treated and untreated teeth are more likely to rate SDF and SSCs poorly.**

Additional Results

- 29 parents of children who received unaesthetic dental treatment completed the additional survey.
- There is no significant difference with regards to parents reporting if their child ever mentioned anything negative about his or her teeth prior to treatment versus after obtaining unaesthetic treatment ($p = 0.6171$).
- There is no significant difference with regards to how parents feel about their child's teeth prior to obtaining unaesthetic dental treatment compared to after obtaining unaesthetic dental treatment ($p = 0.131$).

Table 3: Additional Survey Data

Survey Question	Yes (%)
Did your child receive teasing or bullying about his/her teeth before treatment?	0%
Has your child avoided smiling or taking photos with teeth visible because of how his/her teeth looked since treatment?	0%
Have you or another family member felt upset or guilty about your child needing dental treatment?	31.0%
Did your child express any concerns or dissatisfaction regarding his/her appearance with the dental treatment?	17.2%
Have you or your child been more motivated to brush his/her teeth since treatment?	79.3%

Discussion and Conclusions

- Parents and children seemed to dislike the appearance of caries the most, then SDF, SSCs, and missing teeth the least.
- Parents are more likely to feel worse about their child's teeth, if their child obtained dental treatment compared to having healthy teeth.
 - Parents of children with treated teeth are significantly more likely to feel worse regarding SDF treatment, SSCs, and their own child's dentition.
- While children under 6 years of age are cognizant of changes to the appearance of a person's smile, they highly regard their dentition, irrespective of their history of dental treatment.
 - Parents of children under the age of 6 who received unaesthetic dental treatment did not report that their child has experienced any bullying as a result of their dental treatment.
- As self awareness starts to develop early in life, it is important that pediatric dentists and parents consider aesthetics in their dental treatment discussions.
- For a more in-depth statistical analysis, further data collection would be recommended.
 - The limited sample size of the private dental insurance group does not allow for a significant data analysis of how socioeconomic factors influence parent and child perception of smile aesthetics.
- Expansion of this study would include analysis of survey data with more specific subgroups including:
 - Type of unaesthetic treatment rendered to the child (extraction, SSC, SDF)
 - Location of unaesthetic dental treatment (anterior versus posterior)
 - Number of teeth with unaesthetic dental treatment rendered

Acknowledgements

Thank you to Jason Lin, Andrea Henao, Hind Al-Jubori, Kaylyn Hudson, Ginger Gerhold, Adit Dutta, Julio Ramirez-Solios, and Seana Gysling for helping with data collection.

References

1. Soares FC, Cardoso M, Bolan M. Altered Esthetics in Primary Central Incisors: The Child's Perception. *Pediatr Dent.* 2015 Sep-Oct;37(5):29-34.
2. Anderson JR. The development of self-recognition: a review. *Dev Psychobiol.* 1984 Jan;17(1):35-49.
3. P. Rochat. Five levels of self-awareness as they unfold early in life *Consciousness and Cognition*, 12 (4) (2003), pp. 717-731.
4. Dion, Karen K., and Ellen Berscheid. "Physical Attractiveness and Peer Perception Among Children." *Sociometry*, vol. 37, no. 1. [American Sociological Association, Sage Publications, Inc.], 1974, pp. 1-12
5. Masnari O, Schiestl C, Weibel L, Wuttke F, Landolt MA. How children with facial differences are perceived by non-affected children and adolescents perceiver effects on stereotypical attitudes. *Body Image.* 2013 Sep;10(4):515-23.