Title:

How well do parents identify their child's baby teeth? Engagement and accuracy of parent-reported information on a tooth checklist survey

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Abstract:

Objectives: Naturally exfoliated primary teeth are being increasingly collected in child development studies. Most of these odontological collections and tooth biobanks use parent-reported information from questionnaires or tooth checklists to collect data on offspring teeth. To the best of the authors' knowledge, no studies have assessed parental engagement in tooth checklists, nor parental accuracy in identifying their child's baby tooth. This study aimed to evaluate these dimensions by analyzing data from the About this Tooth checklist returned with donated primary teeth in a natural experimental study called STRONG (the Stories Teeth Record of Newborn Growth).

Methods: Parental self-reported information were analyzed on checklists returned with 825 primary teeth belonging to 199 children. The percentage of blank answers was calculated for each question. The accuracy of parents-reported tooth identification was evaluated by comparing parental ratings to researchers' ratings. Reliability of researchers' tooth identification was first evaluated by calculating intra-observer and inter-observer agreements, as well as Cohen's Kappa values. The percentage of accuracy of parents' tooth identification (relative to researcher's) was then calculated, and logistic regressions were used to evaluate if time elapsed between when exfoliation occurred and the checklist was completed associated with parental accuracy in tooth identification.

Results: Parents returned 98.4% of the checklists and completed 74.9% to 97.7% of the questions. Excellent reliability was demonstrated for researchers' intra- and inter-rater tooth identification (agreement percentages > 90%; Cohen's Kappa values > 0.83). Moderate accuracy of parents-reported tooth identifications was found, with parents correctly identifying 49.5% of the donated tooth. Better parental accuracies were highlighted for partial identifications (87.1% of correct jaw, 75.6% of correct tooth type, and 65.8% of correct lateralization). Logistic regressions showed the odds of correct parental identifications decreased on average by 1.8% every 30 days of distance between tooth exfoliation and checklist completion.

Conclusions: While parental engagement is high, parents-reported tooth identifications have moderate accuracy, which decreases over time. High accuracy is however found for partial identifications. Parent-reported information on the accompanying questionnaire of naturally exfoliated primary teeth collection or tooth biobanks, even when filled in a long time after exfoliation took place, should be encouraged. However, expert identifications of teeth should remain best practice.

Keywords:

parent-reported data, questionnaire, child, dentition, deciduous teeth, anatomy, odontological collection, tooth biobank

Introduction

Primary teeth (also known as deciduous, baby, or milk teeth) are naturally exfoliated during childhood and are distinct in holding an extensive record of life experiences that occur during tooth formation, including maternal and perinatal health, gestation and birth conditions, health-related stress[1-4], and toxin exposures from prenatal to postnatal periods[5-8]. Indeed, primary teeth may record both health risks[9] and positive life events[10]. Therefore, teeth have great potential to be unique non-invasive biomarkers for child development, dental, and oral epidemiology studies.

The collection of exfoliated primary teeth has grown substantially in child development research in particular. There are now several population-based studies that have collected primary teeth along with oral health data at various time points throughout childhood to evaluate health outcomes together with phenotypic, genetic, and epigenetic data[11,12,]. Researchers in archaeology, forensic and biological anthropology are also creating reference collections of primary teeth[13,14] to understand the human variation and evolution in dental morphometry, growth, and development.

Identification of naturally exfoliated primary teeth donated to research can be challenging. Donated teeth are isolated, unlike remains from archeological or forensic contexts that are often included in the jaws or found associated with other elements of the dentition, which aids in correct identification[15-17]. Tooth identification can be further hindered when only one tooth or very few teeth are donated from the same individual, making the comparison for size and dentition-specific size and shape characteristics for an individual difficult. Occlusal wear can also hamper identification, as moderately to advanced worn teeth will be missing diagnostic features on their crown. Furthermore, the roots often cannot be used to guide identification, as they are mostly to completely absent in exfoliated teeth due to resorption. Because of these factors, even expert tooth raters with years of training and practice (i.e., dentists; anthropologists) may face some challenges in identifying teeth. Yet, to the best of the authors' knowledge, no studies have empirically assessed the inter- and intra-rater reliability of tooth identifications by experienced raters in a large sample of primary exfoliated teeth.

Parent-reported data may provide an alternative strategy to collect information about teeth and the people who donate them. In fact, the majority of odontological collections or tooth biobanks rely on participants' self-report data in questionnaires or tooth checklists. These measures can include questions on the donated tooth, oral health, tooth restorations and extractions, tooth gingival emergence, ancestry, dental habits, health history, as well as exposure to stressful life events[11,13,14]. However, little research has been conducted to assess the accuracy of parent-reported information about their child's teeth or how parent-reported information may differ from expert raters. As primary teeth collection becomes more prominent in child development research and other fields, it is important to evaluate the completeness and accuracy of checklists designed to collect information about teeth so researchers can identify the types of data that can (and cannot) be effectively collected from parents.

In pediatric clinical research, the use of parent-reported data is widespread due to protections of participants under the age of consent[18], as well as limitations in the ability of young children who may not have achieved literacy to comprehend written questions. However, current literature suggests the accuracy of parent reports regarding their child's health are inconsistent. Several examples in pediatric dentistry show that parent-reported information about child's health varies widely by health condition (e.g., mental and behavioral disorders, congenital malformations, respiratory, hematologic or cardiovascular conditions), making parent-reported data alone possibly insufficient for dental practitioners' or researchers' use[19]. Parent-reported data about their child's dental health also sometimes show significant deviation from clinician-observed behaviors. For example, discrepancies were present in parent-reported versus observed tooth-brushing duration, the use of fluoride, and the amount of toothpaste used[20]. On the other hand, previous studies have shown that parent responses to a Likert scale questionnaire accurately predicted child tooth-brushing behaviors[21]. Given the increase of primary teeth collection in child development research, and current reliance on parental reports to collect basic information about donated baby teeth, the need to understand the accuracy of parent-reported information about their child's dental status becomes more pressing.

The aim of this study was to understand the extent to which scientists can use parent-reported data on their children's exfoliated teeth. To achieve this aim, parental engagement in a self-reported questionnaire regarding exfoliated primary teeth was investigated, the reliability of researchers' intra-observer and inter-observer tooth identifications was assessed, and the accuracy of parent-reported tooth identifications was evaluated by comparing parental ratings to researcher ratings. A secondary aim was to propose guidelines for improving tooth checklists in primary teeth collections.

Results from this investigation could be useful for dental research and clinical care. The current study builds on prior research in community dentistry and oral health epidemiology, where researchers developed checklists for parents to report on their children's health and behavior (e.g. tooth brushing, caries, oral health status) as part of research or clinical care, and evaluated the accuracy of these types of self-reported data[19-24]. Data derived from such checklists may provide the only source of information related to a child's teeth and oral health, when clinical data related to these concepts is unavailable but needed for research or clinical purposes[22]. The use of such checklists in oral health epidemiology could become very useful in understanding parental knowledge and attention to their children's primary oral health, and therefore, in implementing preventive strategies to improve children oral health and care[25]. Indeed, checklists may, in and of themselves, serve as mini-interventions in clinical settings, as they may increase parental oral health-related knowledge and potential engagement in their children's oral health care[26].

Methods

Participants

Data for the current study came from the Stories Teeth Record of Newborn Growth (STRONG), a natural experiment study that collected primary teeth, via hospital- and community-based recruitment, to understand how a calendar-dated, community-wide stressor – the Boston Marathon bombings and subsequent manhunt in April 2013 – affected mothers and how these events might be recorded in their offspring's teeth.

Ethical approval for STRONG was obtained from the Mass General Brigham Institutional Review Board (IRB) in 2019 (protocol ID 2019P003570). Informed consent for the use of human specimens, data collected via questionnaires and clinics was obtained from participants following the recommendations of the Mass General Brigham IRB. All research adhered to the Declaration of Helsinki and the Health Insurance Portability and Accountability Act, as well as standards of reporting.

Mother-reported measures

Enrolled mothers, who were pregnant or raising newborns (children less than 1 year of age at the time of the bombings and manhunt event) completed a phone intake with research staff member to document their experiences regarding the events. After the intake, "Science Tooth Fairy kits" were mailed to participants to collect teeth. Among other things, these kits contained a questionnaire – called the About this Tooth checklist (see **Supplementary Figure 1**) – for mothers to complete about each donated tooth (the word "mothers" is used throughout this study, while acknowledging that the checklist could have been completed by another caregiver).

Checklist items included: the date of completion of the questionnaire (1 question); when, where and how the tooth was lost (3 questions); the storage condition of the tooth (1 question); the characteristics of the tooth itself (3 questions); and the child's dental health habits (6 questions). The primary outcome measure was the specific tooth identified by mothers, which they provided by circling the tooth on a mouth drawing on the associated checklist (see Question 6 in **Supplementary Figure 1**).

If the enrolled child had an older biological sibling whose teeth had been saved separately, mothers could enroll their older child and send in their primary teeth. As of this writing, 825 primary teeth from 199 children were donated to the STRONG study. Of these 825 teeth, 100 (12%) belonged to older siblings.

Researchers' identification of teeth

All 825 donated teeth were identified by MLL or SAML, both expert raters who completed formal training in dental anatomy and have a degree in biological anthropology. Teeth were randomly selected to perform intra-observer and inter-observer identification ratings on at least 75% and 10% of the whole sample, respectively. The intra-rater sample comprises 648 teeth (including 5.2% of older sibling teeth) that were identified by MLL twice (in November 2022 and in March 2023). The inter-rater sample is composed of 82 teeth (including no older sibling teeth) that were identified in March 2023 by the two expert raters (MLL and SAML).

Data analysis

First, the percentage of blank answers was calculated for each question in the About This Tooth checklist to evaluate mother engagement. Second, the answers provided for the tooth identification question were analyzed. While a single tooth circled was the expected answer, mothers provided other responses: some added a "maybe" near the circled tooth, some provided multiple choices circling several teeth. In other cases, mothers did not attempt to circle a tooth, but wrote a question mark "?" or "don't know". Therefore, the possible options for the mothers' tooth identification answers were categorized into the following categories: 1=no response to the question, 2=do not know, 3=identified with uncertainty and 4=identified with no stated uncertainty. Then the percentage of answers according to these categories was calculated. Only the fourth category was considered as the acceptable answer.

Before evaluating mothers' tooth identifications, the agreement and reliability of researchers' tooth identifications was ensured. First the intra-rater and inter-rater percentages of agreements were calculated for the full tooth identification (e.g., upper left central incisor), as well as the agreements of partial identification breakdowns by jaw (upper or lower), lateralization (right or left), and tooth type (incisor, canine or molar). Next, Cohen's Kappa was used to assess the reliability of intra-observer and inter-observer ratings. The Cohen's Kappa is a quantitative measure of reliability that provides a value from 0 (no agreement between raters) to 1 (total agreement between raters).

Then the mothers' answers were compared to the researchers' ratings. To assess the accuracy level of the mothers' tooth identification, only responses to the fourth category, identification with no stated uncertainty (N=558 teeth; 7.2% were older sibling teeth) were analyzed. The percentage of accuracy was calculated for the full tooth identification and the partial identification breakdowns (by jaw, lateralization, and tooth type). Also, the percent accuracy of full and all tooth identification breakdowns were calculated across all mothers, followed by the average accuracy within-families according to the number of teeth identified by the mothers.

Confusion matrices were created for researchers' intra-observer and inter-observer ratings, as well as for mothers' tooth identifications. Confusion matrices are tables that summarize prediction outcomes, specifically showing where the most, or least, inaccurate predictions ("confusions") occur across all possible classifications. Confusion matrices can be used to calculate measures beyond accuracy such as precision, sensitivity, and specificity.

Finally, because mothers donated teeth to STRONG across time, logistic regressions were used to evaluate whether the time between when the tooth was lost and when the mother completed the checklist predicted full and partial tooth identification accuracies. Clustered standard errors were calculated for the regressions to account for within-family variability.

Results

Only 13 teeth (1.6%) were not returned with an About this Tooth checklist. The percent of incomplete answers for each question on the checklist ranged from 2.3% (if the child drinks beverages with artificial sweetener) to 25.1% (date when the tooth was lost) (**Figure 1**). Overall, the most complete questions were about the child's habits and dental hygiene (only 2.3% – 4.4% incomplete). The questions related to the tooth itself and its characteristics (identification, chipped, broken) were the most incomplete (7.3%, 12.1%, 11.6%, respectively).

Regarding the tooth identification question, 68.2% of the mothers provided acceptable answers, identifying a tooth with no stated uncertainty (**Figure 2**); 11.2% of mothers identified a tooth but stated uncertainty; 11.7% did not attempt any identification or answered "do not know" or "?".

Researchers' intra-rater and inter-rater tooth identifications had very good agreement (**Table 1**). All percentage agreements for full tooth identification, as well as partial identification by jaw, lateralization, and tooth type, were higher than 90%. For partial identifications, the highest agreement for both intra- and inter-rater comparisons was found for tooth type (99.4% and

98.8%, respectively), while the most disagreement was found for lateralization (93.5% and 91.5%, respectively). Overall, Cohen's Kappa values were very high for intra-rater (0.87 to 0.99) and inter-rater comparisons (0.83 to 0.97). For intra-rater scorings, 42 confusions were present for lateralization (mainly central incisors, 26 cases), 6 for jaw, and 4 for tooth type (**Supplementary Table 1**). For inter-rater scorings, 7 confusions for lateralization, 3 for jaw, and 1 for tooth type were found (**Supplementary Table 2**).

Mothers' full tooth identifications with no stated uncertainty (N=558) were correct in 49.5% of the checklists (**Table 2**). Jaw identifications had high accuracy (87.1%). Tooth types were accurate in 75.6% of cases, and lateralization had slightly lower accuracy (65.8%). Among mothers' identification, 173 confusions were found for lateralization, 122 for tooth type and 65 for jaw (**Supplementary Table 3**).

The average number of teeth identified by each mother was 3.69. The accuracy of each mothers' full tooth identification for all teeth rated ranged from 0% to 100%, reflecting mothers that were both exceptionally correct and exceptionally incorrect at identifying their children's teeth. There was no distinct pattern in accuracy based on the number of teeth a mother identified (**Supplementary Figure 2**).

For the teeth with both acceptable mothers' identifications and completed date information (N=522), the time elapsed between the tooth being lost and the mothers completing the checklist ranged from 0 to 1429 days for main study participants (mean=271 days; N=481 teeth, 150 children), and 0 to 2645 for older siblings (mean=669 days; N=41 teeth, 9 children). The logistic regression results (**Table 3**) of all 522 teeth show that the odds of a correct full tooth identification decrease by 1.8% every 30 days. The odds of a correct jaw, lateralization, and tooth type identification decrease by 3.0%, 1.5% and 2.4%, respectively, every 30 days.

Discussion

The three main findings of this study are: 1) mothers showed a high level of engagement in reporting information about their children's teeth, as demonstrated by the number of returned checklists (812 out of 825) and their high percentage of completed answers (74.9% to 97.7%);

2) researchers had excellent intra- and inter-observer reliability in identifying primary teeth, with all percentage agreements between 90% and 99.4%; and 3) mothers had mixed accuracy in identifying teeth, with 49.5% of correct full tooth identification but being better at partial identification (65.8% for lateralization, 75.6% for tooth type, and 87.1% for jaw).

The high parental engagement and the large number of donated teeth reflect the strong interest of the public to be involved in research, as shown in other collections[13,14]. Completion of parent-reported information on tooth checklists varies according to the question category. The information about the tooth itself and its characteristics are the least completed: 7.3% of the teeth are not identified and 11-12% of broken or chipped tooth information is missing. However, these findings suggest parents are willing and in large part can identify the donated tooth, with one-quarter being uncertain.

The findings on researchers' very good agreements for the tooth types come as no surprise, given the experience and extensive training that biological anthropologists receive in tooth identification. Lateralization can be more difficult for incisors, especially if the incisal edge is lost due to wear, as incisors exhibit fewer morphological characteristics for siding than molars[15-17]. Although there was hardly any confusion about jaw assignment for inter- and intra-rater agreements, advanced stages of wear can create confusion between an upper lateral incisor and a lower canine[15]. Such confusion becomes more pertinent when only a single tooth is available from an individual, and intra-dentition comparison cannot aid in identification[17]. While primary teeth are considered evolutionarily conservative and more stable than permanent dentition[27], a high variation of size and shape was found in the STRONG teeth, which also display various patterns of occlusal wear, including extensive wear stages for anterior teeth especially. For advanced worn teeth, tooth roots can often aid in correct identification as the size, shape, and orientation of the roots are highly indicative. However, exfoliated primary teeth generally have largely or completely absorbed roots, which therefore cannot be used as a diagnostic feature. Difficulty in identification is certainly not limited to the primary dentition and can even lead to incorrect identification of human vs non-human dentition[28], as confusions have been reported between human and reindeer anterior teeth[29] and between worn neandertal and bear teeth[30,31].

Although the researchers' tooth identification was not hindered by studied factors, these obstacles might give insight into the parents' responses for whom no training or background in dental anatomy is expected. The current study findings reveal a moderate accuracy of the mothers' tooth identification, with mothers correctly performing full tooth identifications about half of the time. Memory and time elapsed might have affected assessment accuracy, as the questionnaire could be completed several days or months after offspring teeth were lost. While a decrease in accuracy was found over time, the jaw is better identified and remembered than lateralization. Furthermore, the lower accuracy for siding might also be due to the reporting method on a mouth drawing where a left tooth is reported on the right side of the drawing. Additionally, this drawing displays primary dentition, which might also have added confusion for the parents if, at the time of the tooth loss, the child mouth exhibited mixed dentition (i.e., composed of both primary and permanent teeth). Accuracy among parents' tooth identifications may be improved by using alternative drawings or images (e.g., drawings of both deciduous and mixed dentitions, different orientations of the mouth, pictures of real children's mouth, see **Supplementary Figure 3**).

Community dentists, pediatric dentists, oral health epidemiologists, and others may benefit directly from the results of this study. First, scientists within and outside of these fields need reliable information. The current study highlights the challenges that may arise through data collected via tooth checklists. It informs scientists about which and how different types of data reported by parents related to their child's exfoliated teeth can be reliably used for data analysis (versus need to be collected via other means). Second, the findings that parental engagement was high but accuracy of tooth identification was moderate show both the clear willingness of parents to be involved in studies related to their children's oral health as well as the limitations in using their self-reported data. This finding is relevant, as it demonstrates that most parents are willing to spend additional effort and time to contribute to research that will improve their children's oral health. Thus, and as elaborated more below, checklists could be helpful in serving as an engagement tool, whether in a research or clinical care setting. However, these findings also indicate that clear guidelines need to be in place if researchers are to fully benefit from data collected through this parental willingness. Oral heath epidemiologists may find results of this study informative for designing studies to examine the distribution and determinants of oral health problems, using this checklist alongside other measures. Finally, unlike researchers (many of whom are not clinicians, but often work with clinicians to connect with possible research participants), dentistry professionals can be the direct line of communication with patients who might consider donating their children's teeth for research. Therefore, the dental practitioners' ability to communicate the relevance of dental studies and their collaboration with researchers in collecting teeth and the accompanying patient data is crucial for advancing all aspects of dental and oral health science. Community and pediatric dentists may find the checklist helpful for engaging with both the child and their caregivers for such purposes, particularly around a critical moment in the child's life – that is, losing baby teeth. The checklist may serve as a tool to help dental practitioners' understand parent's engagement with their child's oral health, and cultural practices related to the disposal of those teeth[32]. The results of this study may also help these clinicians tailor their communication with their patients to specific oral health topics to increase their knowledge[33,34]. Thus, the checklist may bring greater awareness to parental attention to their children's oral health care, and this, in return, can contribute to the prevention of dental diseases[25,35].

This study had several strengths. First, to the authors' best knowledge, this study is the first to evaluate researchers' reliability of primary tooth identifications and the first to assess parent-reported tooth identification accuracy. This study, therefore, fills important gaps in the literature. Second, the data were complete. Very few (1.6%) offspring teeth were donated without a checklist. Further, nine of the 14 questions were completed in more than 95% of the returned checklists. Third, the analytic sample of 199 children having donated 825 teeth was large, especially by the standards of a tooth biospecimen collection.

This study also had some limitations. The researcher's inter-rater reliability was evaluated on a small sample of 82 teeth, which includes incisors and canines but no molars. Also, as the demographics of participants enrolled in this study show high socioeconomic status, such findings might reflect the upper band of parental engagement and accuracy. Future studies with more diverse populations are needed. Furthermore, the accuracy of parent-reported information about their child's dental health was not assessed, as an objective way of assessing children's dental health habits was not possible for the donated teeth. Future studies may evaluate these aspects using mouth pictures or patient dental records.

These findings highlight the need to triangulate sources of data. Researchers cannot rely on the checklists alone for tooth identification and must invest time to identify the teeth collected. While the full tooth identification of the mothers shows only moderate accuracy, the high accuracy for their partial identification of jaw and tooth type is very useful to confirm the researchers' tooth identification, especially when clear diagnostic features are not preserved. For example, one child had a highly worn tooth that we, two trained anthropologists, identified as an upper left lateral incisor. This identification caused a duplicate issue as this exact tooth seemed to have already been collected for this child. While the mother identified an upper right canine in this case, the information on both checklists made us change the lateralization of this worn tooth to a right lateral incisor.

Findings and experiences conducted in the STRONG study allow us to suggest recommendations to improve parent-report information on tooth checklists. The number of questions asked should be kept to a minimum to avoid the burden on the participant, even though a high engagement of the parents is present for a two-sided questionnaire. Providing circling options seems to encourage parents to respond and might be preferable over open answers to promote accuracy. Parent-reported information, even partial or delayed, is helpful for isolated teeth. It can provide crucial information complementary to researcher identification, especially in the case of highly worn teeth. Future studies may consider providing parents with different drawings of both deciduous and mixed dentitions and/or alternative images of the jaws (see **Supplementary Figure 3**). Finally, asking parents to take snapshots of the child's mouth on the day, or shortly after a tooth was lost, to accompany the checklist might provide relevant information on tooth position.

Conclusions

While parental engagement is high, reported tooth identifications show a moderate accuracy which decreases over time. High accuracy is however found for partial identifications. Parent-reported information about naturally exfoliated primary teeth, even when reported a long time after exfoliation took place, should be encouraged.

References

1. Hassett BR, Dean MC, Ring S, Atkinson C, Ness AR, Humphrey L. Effects of maternal, gestational, and perinatal variables on neonatal line width observed in a modern UK birth cohort. *Am J Phys Anthropol* 2020;172(2):314-332. doi:10.1002/ajpa.24042
2. Lemmers SAM, Dirks W, Street SE, Ngoubangoye B, Herbert A, Setchell JM. Dental microstructure records life history events: A histological study of mandrills (Mandrillus sphinx) from Gabon. *J Hum Evol* 2021;158:103046. doi:10.1016/j.jhevol.2021.103046
3. Lorentz KO, Lemmers SAM, Chrysostomou C, et al. Use of dental microstructure to investigate the role of prenatal and early life physiological stress in age at death. *J Archeo Sci* 2019;104:85-96. doi:10.1016/j.jas.2019.01.007
4. Dean MC, Humphrey L, Groom A, Hassett B. Variation in the timing of enamel formation in modern human deciduous canines. *Arch Oral Biol* 2020;114:104719. doi:10.1016/j.archoralbio.2020.104719
5. Agarwal KN, Narula S, Faridi MM, Kalra N. Deciduous dentition and enamel defects. *Indian Pediatr* 2003;40(2):124-9.
6. Arora M, Austin C. Teeth as a biomarker of past chemical exposure. *Curr Opin Pediatr* 2013;25(2):261-267. doi:10.1097/MOP.0b013e32835e9084
7. Ben Said A, Telmoudi C, Louati K, et al. Evaluation of the reliability of human teeth matrix used as a biomarker for fluoride environmental pollution. *Ann Pharm Fr* 2020;78(1):21-33. doi:10.1016/j.pharma.2019.10.006
8. Kurek M, Żądzińska E, Sitek A, Borowska-Strugińska B, Rosset I, Lorkiewicz W. Prenatal factors associated with the neonatal line thickness in human deciduous incisors. *HOMO* 2015;66(3):251-263. doi:10.1016/j.jchb.2014.11.001
9. Davis KA, Mountain RV, Pickett OR, Den Besten PK, Bidlack FB, Dunn EC. Teeth as Potential New Tools to Measure Early-Life Adversity and Subsequent Mental Health Risk: An Interdisciplinary Review and Conceptual Model. *Biol Psychiatry* 2020;87(6):502-513. doi:10.1016/j.biopsych.2019.09.030
10. Mountain RV, Zhu Y, Pickett OR, et al. Association of Maternal Stress and Social Support During Pregnancy With Growth Marks in Children's Primary Tooth Enamel. *JAMA Netw Open* 2021;4(11):e2129129. doi:10.1001/jamanetworkopen.2021.29129

11. Dudding T, Haworth S, Sandy J, Timpson NJ. Age 23 years + oral health questionnaire in Avon Longitudinal Study of Parents and Children. *Wellcome Open Res* 2018;3:34. doi:10.12688/wellcomeopenres.14159.2
12. Stein DJ, Koen N, Donald KA, et al. Investigating the psychosocial determinants of child health in Africa: The Drakenstein Child Health Study. *J Neurosci Methods* 2015;252:27-35. doi:10.1016/j.jneumeth.2015.03.016
13. Le Luyer M, Bayle P. The Tooth Fairy collection (la collection Petite souris), a sample of documented human deciduous teeth at the University of Bordeaux, France. *Am J Biol Anthropol* 2022;177(1):171-185. doi:10.1002/ajpa.24405
14. Martínez de Pinillos M, Pantoja-Pérez A, Fernández-Colón P, et al. The Ratón Pérez collection: Modern deciduous human teeth at the Centro Nacional de Investigación sobre la Evolución Humana (Burgos, Spain). *Am J Phys Anthropol* 2021;176(3):528-535. doi:10.1002/ajpa.24371
15. Hillson S. *Dental anthropology*. Cambridge University Press; 1996:373.
16. Toussaint M. Clés de détermination des dents humaines isolées, découvertes en contexte archéo-anthropologique. *Bull Cherch Wallonie* 1996;36:73-117.
17. White TD, Folkens PA. *The human bone manual*. Elsevier; 2005:464.
18. United States DoHaHS. 45 CFR 46 Subpart D — Additional Protections for Children Involved as Subjects in Research (1983).
19. Chiao C, Tuncer AH, Jin M, Shanmugham JR, Discepolo KE. Accuracy of parent-reported health history in a dental setting. *J Am Dent Assoc* 2022;153(11):1053-1059. doi:10.1016/j.adaj.2022.07.007
20. Martin M, Rosales G, Sandoval A, et al. What really happens in the home: a comparison of parent-reported and observed tooth brushing behaviors for young children. *BMC Oral Health* 2019;19(1):35. doi:10.1186/s12903-019-0725-5
21. Tadakamadla SK, Mitchell AE, Johnson NW, Morawska A. Development and validation of the parenting and child tooth brushing assessment questionnaire. *Community Dent Oral Epidemiol* 2022;50(3):180-190. doi:10.1111/cdoe.12649
22. Marcus M, Xiong D, Wang Y, et al. Development of toolkits for detecting dental caries and caries experience among children using self-report and parent report. *Community Dent Oral Epidemiol* 2019;47(6):520–527. doi:https://doi.org/10.1111/cdoe.12494

23. Kalhan TA, Loo EXL, Shek LP, et al. Evaluation of caregiver-reported criteria for diagnosing eczema in young children. *Pediatr Allergy Immunol* 2022;33(1):e13675. doi:10.1111/pai.13675
24. Zonfrillo MR, Myers RK, Durbin DR, Curry AE. Validation of Parent-Reported Injuries to Their Children. *Clin Pediatr (Phila)* 2015;54(10):983-6. doi:10.1177/0009922814566931
25. Buldur B. Pathways between parental and individual determinants of dental caries and dental visit behaviours among children: Validation of a new conceptual model. *Community Dent Oral Epidemiol* 2020;48(4):280-287. doi:10.1111/cdoe.12530
26. De Silva-Sanigorski A, Ashbolt R, Green J, et al. Parental self-efficacy and oral health-related knowledge are associated with parent and child oral health behaviors and self-reported oral health status. . *Community Dent Oral Epidemiol* 2013;41(4):345–352. doi:https://doi.org/10.1111/cdoe.12019
27. Scott GR, Turner CG. *The anthropology of modern human teeth. Dental morphology and its variation in recent human populations.* Cambridge Univeristy Press; 1997:382.
28. Hillson S. *Teeth*. Cambridge University Press; 2005:373.
29. Mafart B. Une reconstitution surprenante d’un fossile humain : la mandibule magdalénienne du crâne d’enfant Rochereil III. *CR Palévol* 2009;8(4):403-412. doi:10.1016/j.crpv.2009.01.002
30. Leroi-Gourhan A. Étude des restes humains fossiles provenant des Grottes d’Arcy-sur-Cure. *Ann Paleontol* 1958;44:87-148.
31. Bayle P, Maureille B, coll. ALBOUY B, et al. *Confusion Homme/Ours : l’impact de l’usure occlusale sur l’identification taxinomique des dents monoradiculées.* ed Bayle P. Fouille 2016-18 de la Grotte Sirogne, Rocamadour, Lot. Rapport intermédiaire de fouille programmée triennale, Service Régional de l’Archéologie Occitanie, Toulouse. 2017:141-148.
32. Parsons CLB, Mountain RV, Lau A, Troulis MJ, Bidlack FB, Dunn EC. The Meaning and Purpose of Primary Tooth Disposal Rituals: Implications for Pediatric Dental Professionals. *Frontiers in Dental Medicine* 2021;2doi:10.3389/fdmed.2021.698144
33. Wong HM, Bridges SM, McGrath CP, Yiu CKY, Zayts OA, Au TKF. Impact of Prominent Themes in Clinician-Patient Conversations on Caregiver’s Perceived Quality of

Communication with Paediatric Dental Visits. *PloS one* 2017;12(1):e0169059. doi:https://doi.org/10.1371/journal.pone.0169059
34. Humphris G, Freeman R. The importance of studying communication processes in the dentist: patient interaction. *Community Dent Health* 2021;38(4):222-223. doi:10.1922/CDH_Dec21editorialHumphris02
35. Nelson S, Slusar MB, Albert JM, Riedy CA. Do baby teeth really matter? Changing parental perception and increasing dental care utilization for young children. *Contemp Clin Trials* 2017;59:13-21. doi:10.1016/j.cct.2017.05.002

Figure and Table legends:

Figure 1: Percentages of blank answers for each question in the About this Tooth checklist.

Figure 2: Percentages for the mothers' tooth identification question by category of responses.

Table 1: Intra- and inter-rater percentage agreements for researchers' tooth identification ratings.

Table 2: Mothers' tooth identification accuracy.

Table 3: Four logistic regression results for mothers' tooth identification accuracy (outcome variable) according to the time elapsed between the date the tooth was lost and the date the checklist was completed (exposure variable) for each tooth identification breakdown.

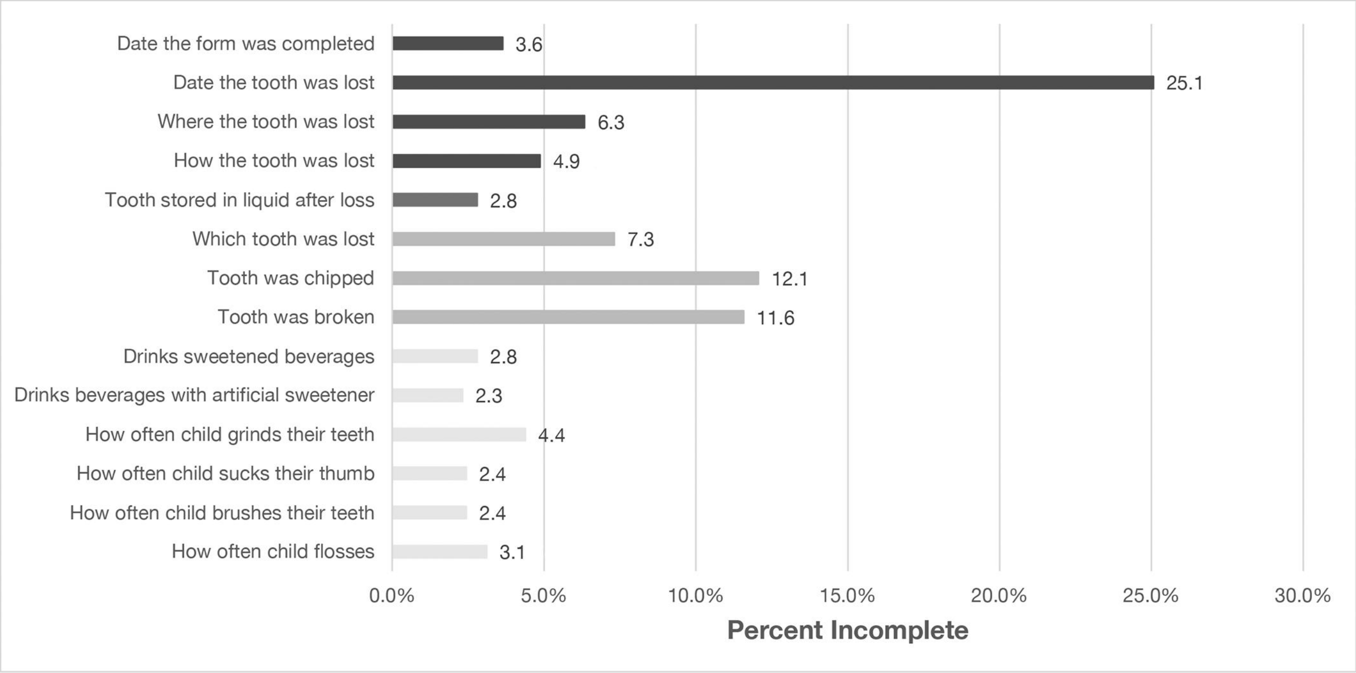

Figure 1: Percentages of blank answers for each question in the About this Tooth checklist.

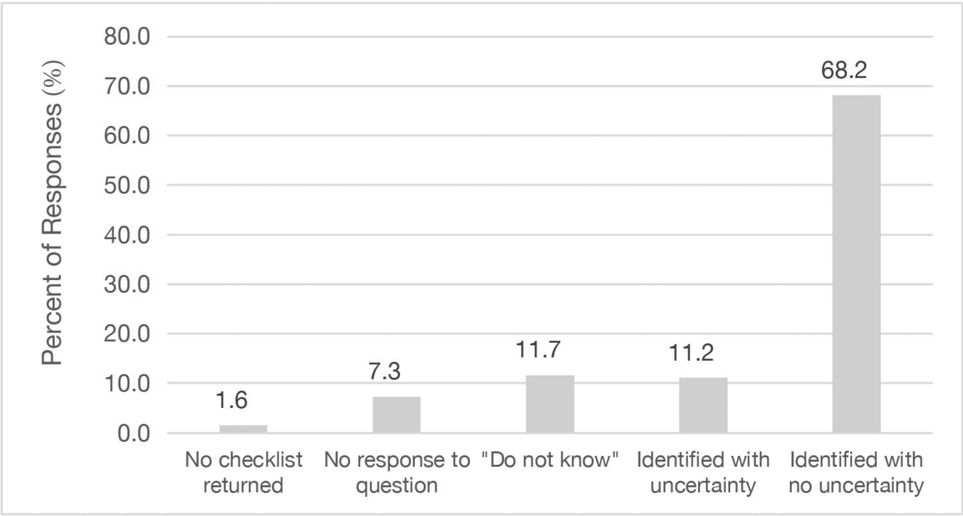

Figure 2: Percentages for the mothers' tooth identification question by category of responses.

Table 1: Intra- and inter-rater percentage agreements for researchers' tooth identification ratings.

Researcher's Tooth Identification		**Total Number of Teeth**	**Percent Agreement (%)**	**Cohen's κ Coefficient**
Intra-Rater (N=648 teeth rated)	Full Tooth*	599	92.4	0.92
	Jaw	642	99.1	0.98
	Lateralization	606	93.5	0.87
	Tooth Type	644	99.4	0.99
Inter-Rater (N=82 teeth rated)	Full Tooth*	74	90.2	0.88
	Jaw	79	96.3	0.93
	Lateralization	75	91.5	0.83
	Tooth Type	81	98.8	0.97

*Full Tooth = Jaw + Lateralization + Tooth Type

Table 2: Mothers' tooth identification accuracy.

Mothers' Tooth Identification (N = 558 teeth)	**Total Number of Teeth Correctly Identified**	**Percent accuracy (%)**
Correct Full Tooth*	276	49.5
Correct Jaw	486	87.1
Correct Lateralization	367	65.8
Correct Tooth Type	422	75.6

*Full Tooth = Jaw + Lateralization + Tooth Type

Table 3: Four logistic regression results for mothers' tooth identification accuracy (outcome variable) according to the time elapsed between the date the tooth was lost and the date the checklist was completed (exposure variable) for each tooth identification breakdown.

Outcome for Mothers' Tooth Identifications	β (odds)	SE (95% CI)	Chi-Square	P-value (clustered SEs)
Full Tooth*	-0.0007 (0.993)	0.0002 (-0.0011, -0.0002)	10.37	0.002 (0.009)
Jaw	-0.001 (0.9990)	0.0002 (-0.0014, -0.0048)	14.37	<0.001 (<0.001)
Lateralization	-0.0005 (0.9995)	0.0002 (-0.0009, -0.0001)	5.26	0.022 (0.063)
Tooth Type	-0.0008 (0.9992)	0.0002 (-0.0012, -0.0004)	13.69	<0.001 (0.002)

*Full Tooth = Jaw + Lateralization + Tooth Type; β = coefficient for days elapsed; SE = Standard Errors; CI = Confidence Interval; Chi-square = chi-square statistic from Likelihood Ratio Test