

Scientific Article

Dutch Primary Schoolchildren's Attitudes Toward Their Dental Appearance

Annemieke Bos, PhD¹ • Johan Hoogstraten, PhD² • Birte PrahL-Andersen, DDS, PhD³

Abstract: ***Purpose:** This study's purpose was to examine children's attitudes toward dental appearance and compare these with attitudes toward general health, body shape, grades in school, friends, money, and sports. The study also explored whether subjects reporting that they have attractive teeth believed themselves to have higher grades in school, more friends, a slim body shape, and better health than subjects reporting that they have unattractive teeth. **Methods:** A sample of 216 9- to 13-year-old Dutch children participated. The methods of paired comparisons and direct ranking were used to investigate children's judgments about the importance of dental appearance. The subjects were also asked to indicate how strongly they believed that they had high grades in school, a lot of friends, money, success in sports, attractive teeth, a slim body shape, and good health. **Results:** High grades in school, a slim body shape, good health, a lot of friends, and more money were preferred to attractive teeth. Children reporting that they have attractive teeth believed themselves to have higher grades in school, a slimmer body shape, more friends, more money, and better health than children reporting that they have unattractive teeth. **Conclusions:** Although attractive teeth are highly valued in general, children give priority to other issues in their lives. (Pediatr Dent 2008;30:439-42) Received August 2, 2007 | Last Revision January 16, 2008 | Revision Accepted January 17, 2008*

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Patients' attitudes toward orthodontic treatment have been examined in several studies.¹⁻³ It has been shown that orthodontic patients' attitudes toward their own occlusions are significantly correlated with patient compliance during orthodontic treatment.⁴ In a previous study, for example, attitudes toward malocclusion were measured using the Orthodontic Attitude Survey (OAS).⁵ One of this questionnaire's subscales contained items concerning the relative value of orthodontic treatment. Specifically, eighth- and ninth-grade children were asked whether they preferred having new clothes, their own car, \$10 each week, a vacation in Florida, attendance at a rock concert, or their teeth straightened. Children planning to receive treatment preferred orthodontic treatment significantly more often than children not planning treatment, even though no differences were found in children's attitudes toward the importance of a good occlusion. Unfortunately, only the mean scores of subjects were compared, and no specific data about relative values toward orthodontic treatment were given.

Although the importance of dental appearance is now widely recognized, to the best of our knowledge no previous

study has aimed to assess dental attitudes of children compared with other issues in children's lives, such as body image, general health, academic and athletic achievement, or the ability to interact with peers. The importance of dental appearance compared with other issues can be adequately examined using the paired-comparison method developed by Thurstone.⁶ In this method, items are presented in pairs and, for each pair, subjects are asked to choose the preferred item. This method, therefore, forces subjects to make a judgment between each pair of items, and all topics are judged relative to all other topics. Using this method, a better insight may be reached in the way children judge the importance of dental appearance compared to other psychological, sociological, or physical issues. Also, one can analyze whether subjects are consistent in their choice of certain issues over others.

The purpose of this study was to analyze dental attitudes of children and to compare these with their attitudes toward general health, body shape, school results, friends, money, and sports.

Methods

To obtain a sizeable sample, 6 Dutch primary schools were selected and asked to participate. Three of these schools were located in Amsterdam, and 3 were located in Spijkennisse, South Holland, both in The Netherlands. Each school was asked to select the 2 highest grades. The study was carried out during an arbitrary lesson. A sample of 244 children participated, but 2 subjects failed to fill in part 3 of the questionnaire and

¹Dr. Bos is working as a PhD and as an associate professor, and ³Dr. PrahL-Andersen is a professor and former chairman, both in the Department of Orthodontics, Academic Centre of Dentistry Amsterdam (ACTA); and ²Dr. Hoogstraten is working as a PhD, chairman and professor, Department of Social Dentistry and Behavioural Sciences, Academic Centre of Dentistry Amsterdam (ACTA), all in Amsterdam, The Netherlands.
Correspond with Dr. Annemieke Bos at a.bos@acta.nl

26 subjects had 1 or more missing values in part 1 and/or part 2. Their data were excluded from the analyses. The final sample used in the present study comprised 216 subjects (104 boys and 112 girls; mean age=10.88±0.81 years; range=9-13).

To analyze the attitudes of subjects toward their dental appearance, general health, body shape, school results, friends, money, and sports, they were asked which of the choices they preferred most. The subjects were then asked to which of the choices they would pay most attention. We explored whether their preferences would be similar to the options they would pay most attention to. Following the paired-comparison method, we asked subjects to rank the choices directly.

To investigate the paired comparison method's validity, its results were compared with the direct-ranking method's results.⁷⁻⁹ Since attitudes are correlated to beliefs,^{10,11} we also asked subjects whether they believed they actually had high grades in school, a slim body shape, a lot of friends, success in sports, a lot of money, good health, and attractive teeth. We explored whether subjects reporting that they have attractive teeth would have a more positive dental attitude than subjects reporting that they have unattractive teeth. Children with high levels of dentofacial attractiveness have been judged to be better looking, more desirable as friends, and more intelligent than children with low dentofacial attractiveness.¹² Based on these judgments, we assessed whether subjects reporting that they have attractive teeth believed themselves to also have higher grades in school, a better body shape, more friends, more success in sports, more money, and better health than subjects who believed that they had unattractive teeth.

We constructed a questionnaire consisting of 4 parts. In parts 1 and 2, each of the 21 pairs ($\frac{1}{2} N [N-1] = \frac{1}{2} 7[7-1] = 3.5[6] = 21$) was presented in a separate booklet. In part 1, each pair was preceded by a standard instruction: "If I had to choose, I'd prefer..." followed by a pair of response options (ie, "attractive teeth" or "high grades in school"). Subjects had to mark 1 of the 2 response options. In part 2, the standard instruction was: "If I had to choose, I would pay most attention

to..." again followed by a pair of response options (ie, "attractive teeth" or "a slim body shape"). The 21 pairs were presented in a balanced-out order, following Ross' method.¹³ In part 3, after completion of the 2-paired comparison tasks, we used the direct-ranking method. Subjects were asked to rank the topics from 1 to 7, starting with the topic they would pay most attention to (1) to the topic they would pay least attention to (7). In part 4, subjects were asked whether they agreed with 7 statements about the different topics (ie, "I have attractive teeth" and "I have high grades in school"). Items were answered on a 5-point scale, ranging from "totally disagree" (1) to "totally agree" (5). Finally, we asked subjects to provide demographic information and to indicate whether they were having or had received orthodontic treatment.

Statistical analyses. The consistency within subjects (intra-subject reliability) for the paired-comparison data was determined by calculating the number of circular triads made and computing Kendall's coefficient of consistency ζ (zeta). A circular triad occurs when a subject indicates that $a > b$, $b > c$, and $a < c$, while the last answer should logically be $a > c$.⁹ The value of ζ was tested for significance using a chi-square distribution.⁶ Furthermore, the consistency of individual judgments was calculated by determining the correspondence between the ranking of topics obtained by the paired-comparison method (parts 1 and 2 of the questionnaire) and the direct-ranking method (part 3). Kendall's rank correlation coefficient was computed,¹⁴ and the rankings of girls and boys and of younger and older children were compared.

The extent to which subjects agreed in their comparative judgments (intersubject agreement) was calculated with Kendall's coefficient of agreement (u),⁶ which ranges from 1 for perfect agreement to -1 for perfect disagreement. The significance of agreement between subjects was tested using the chi-square statistic. Finally, part 4's results were analyzed. Data were analyzed using SPSS 11.0 (SPSS, Inc, Chicago, Ill).

Table 1. THE FREQUENCY WITH WHICH EACH COLUMN ITEM IS PREFERRED OVER EACH ROW ITEM

	High grades in school N (%)	Slim body shape N (%)	More friends N (%)	Success in sports N (%)	More money N (%)	Good health N (%)	Attractive teeth N (%)
High grades in school	—	48 (22)	97 (45)	45 (21)	65 (30)	183 (85)	72 (33)
Slim body shape	168 (78)	—	152 (70)	121 (56)	90 (42)	194 (90)	93 (43)
More friends	119 (55)	64 (30)	—	54 (25)	57 (26)	167 (77)	84 (39)
Success in sports	171 (79)	95 (44)	162 (75)	—	94 (44)	196 (91)	102 (47)
More money	151 (70)	126 (58)	159 (74)	122 (56)	—	194 (90)	128 (59)
Good health	33 (15)	22 (10)	49 (23)	20 (9)	22 (10)	—	16 (7)
Attractive teeth	144 (67)	123 (57)	132 (61)	114 (53)	88 (41)	200 (93)	—
Total	786 (17)	478 (11)	751 (17)	476 (10)	416 (9)	1,134 (25)	495 (11)
Rank	2	5	3	6	7	1	4
Direct ranking	2	5	3	7	4	1	6

Table 2. THE FREQUENCY WITH WHICH EACH COLUMN ITEM IS JUDGED TO BE MORE WORTHWHILE TO PAY ATTENTION TO COMPARED TO EACH ROW ITEM

	High grades in school N (%)	Slim body shape N (%)	More friends N (%)	Success in sports N (%)	More money N (%)	Good health N (%)	Attractive teeth N (%)
High grades in school	—	50 (23)	75 (35)	48 (22)	66 (31)	156 (72)	57 (26)
Slim body shape	166 (77)	—	131 (61)	132 (61)	112 (52)	193 (89)	85 (39)
More friends	141 (65)	85 (39)	—	79 (37)	81 (37)	174 (81)	98 (45)
Success in sports	168 (78)	84 (39)	137 (63)	—	108 (50)	182 (84)	113 (52)
More money	150 (69)	104 (48)	135 (63)	108 (50)	—	192 (89)	111 (51)
Good health	60 (28)	23 (11)	42 (19)	34 (16)	24 (11)	—	17 (8)
Attractive teeth	159 (74)	131 (61)	118 (55)	103 (48)	105 (49)	199 (92)	—
Total	844 (19)	477 (10)	638 (14)	504 (11)	496 (11)	1,096 (24)	481 (11)
Rank	2	7	3	4	5	1	6
Direct ranking	2	5	3	7	4	1	6

Table 3. DIRECT RANKING OF SUBJECTS REPORTING THAT THEY HAVE ATTRACTIVE OR UNATTRACTIVE TEETH

	High grades in school N (%)	Slim body shape N (%)	More friends N (%)	Success in sports N (%)	More money N (%)	Good health N (%)	Attractive teeth N (%)
Children with attractive teeth	2	4	3	6	7	1	5
Children with unattractive teeth	2	5	3	7	4	1	6

Results

The number of circular triads made was not significant, indicating that all subjects showed consistency in their judgments. The results of the paired comparisons are presented in Tables 1 and 2. The frequency with which the choice in column is preferred over the topic in a row can be found at the intersection of that column and row. In Table 1, for example, 72 subjects preferred having attractive teeth to having high grades in school and 144 subjects preferred having high grades to attractive teeth. In Table 2, 85 subjects would pay more attention to attractive teeth than to a slim body shape, and 131 subjects would pay more attention to a slim body shape than to attractive teeth. In Tables 1 and 2, all frequencies are summed up so that an overall ordering for all topics is obtained. The results for the overall and direct rankings can be found at the bottom of the tables.

Kendall's rank correlation coefficient of the 2 ranking methods in Tables 1 and 2 indicates that there is a high degree of agreement between the overall ranking of the preference of topics and direct ranking (T=0.81, P=.005), but a lower level of agreement between direct ranking and the overall ranking of topics that subjects would pay most attention to (T=0.62, P=.035). Kendall's *u* statistic, or the coefficient of intersubject agreement, was calculated and tested for significance, resulting

in *u*=0.24 (chi-square (21)=1,129, P<.001) for part 1, and *u*=0.20 (chi-square (21)=944, P<.001) for part 2 of the questionnaire. These results show that there is significant agreement between subjects about the preferred choices and about choices to which they would pay the most attention. When we compared subjects with low and high scores on the item "I have attractive teeth," significant differences were found. Subjects who reported having attractive teeth (N=97) also reported having higher grades in school (*t*=2.82, P=.005), a slimmer body shape (*t*=5.43, P<.001), more friends (*t*=2.29, P=.023), more money (*t*=3.26, P=.001), and better health (*t*=3.39, P=.001) than subjects who reported that they have unattractive teeth (N=119). In Table 3, the direct rankings are given for subjects who reported having attractive or unattractive teeth.

Although subjects reporting that they have attractive teeth they would pay more attention to their teeth than subjects reporting that they have unattractive teeth, the difference between both rankings was not significant (T= 0.71, P=.015). No sex or age differences were found. Although 32 subjects were under orthodontic treatment, there were no differences between orthodontic patients and other subjects.

Discussion

All subjects in the present study preferred attractive teeth to success in sports, but high grades in school, a slim body shape, many friends, a lot of money, and good health were preferred to attractive teeth. This implies that, although attractive teeth are highly valued in general,^{5,15} children give priority to other issues in their lives.

In an earlier study, children with high levels of dentofacial attractiveness were judged to be better looking, more desirable as friends, and more intelligent than children with low dentofacial attractiveness.¹² Our results showed that children reporting that they have attractive teeth believed themselves to have higher grades in school, a slimmer body shape, more friends, more money, and better health than children reporting that they have unattractive teeth. It has been previously stated that dissatisfaction with dental appearance may be an indicator of a global lack of self-esteem.¹⁶ Our study's results suggest that dentofacial satisfaction may be an indicator of high self-esteem. It is also possible that dentofacial attractiveness has a positive halo effect.

Although there may be considerable variance in the biological and psychological development of subjects in our sample, all subjects were found to be fairly to highly consistent judges. The high correlations between the pairwise comparisons and direct rankings confirm this consistency of judgment.

There were no differences between boys and girls and younger and older subjects. This may be due to the sample's small age range. To test our findings' generalizability, samples of children in other age groups should be examined. It may be worthwhile to investigate whether our results would apply to other age groups or whether they are reflective of the developmental stage of the age group used in our study. It should be kept in mind that our study was conducted with Dutch schoolchildren, and the results may not be generalizable to children in other countries.

To summarize, the paired-comparison method was found to be satisfactory for ranking the importance of different issues in the lives of children, as well as for ranking the topics to which they would pay most attention. The finding that no differences were found between the paired-comparison method and direct ranking suggests that the construct validity of the present study is high and that both methods proved to be valuable tools to measure children's attitudes.

Conclusions

Based on this study's results, the following conclusions can be made:

1. Children reporting that they have attractive teeth believe themselves to have higher grades in school, a slimmer body shape, more friends, more money, and better health than children reporting that they have unattractive teeth.
2. Although attractive teeth are highly valued in general, children give priority to other issues in their lives.

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