

# Comparison between the Opinions of Tanzanian Parents and Their Children on Dental Attractiveness

E. A. Mugonzibwa, DDS<sup>a</sup>; A. M. Kuijpers-Jagtman, DDS, PhD<sup>b</sup>; M. A. van't Hof PhD<sup>c</sup>;  
E. N. Kikwilu, DDS, M. Dent

**Abstract:** The objective was to investigate the opinion of Tanzanian parents on dental attractiveness and to compare their opinion with that of their children. A prestructured questionnaire with 18 intraoral frontal photographs was given to 286 parents and their children aged 9–18 years. The photographs represented various types of occlusion traits, with the first 10 intraoral photographs representing grade 1–10 of the aesthetic component (AC) of the index of orthodontic treatment need, and the remaining eight photographs were added to represent malocclusions that are often seen in Tanzania. Basic statistical techniques were used to analyze the data. Photographs showing severe deviations were perceived by both children and parents as the most unattractive. The opinion was significantly correlated with children's age ( $P = .02$ ) and sex ( $P < .0005$ ), with older girls tending to dislike photographs showing severe deviations the most. The mean of the opinion for the photographs showing some spacing with overbite  $\leq 2$  mm or open bite and overbite  $> 2$  mm fell in the middle of the scale, with a tendency toward unattractiveness. Photographs matching 8–10 on the AC scale were perceived as the most unattractive, indicating what could be a lay person's priority when considering an orthodontic treatment policy in Tanzania. (*Angle Orthod* 2004;74:63–70.)

**Key Words:** Dental attractiveness; IOTN index; Treatment need; Occlusion gender preference

## INTRODUCTION

The perception of beauty is an individual preference that may be influenced by training, cultural and ethnic factors.<sup>1–3</sup> Although perception of malocclusion is influenced by aesthetic norms in the society, it is also related to individual psychological factors and norms for dental attractiveness. While dental spacing, especially median diastema, is significantly disapproved in Caucasian cultures,<sup>4,5</sup> it is believed to be a desirable sign of beauty in many African cultures, although there is no published report to support this belief.

The lay person's negative opinion on dental deviations has been demonstrated in several studies.<sup>6–9</sup> Shaw et al<sup>6</sup>

showed that individuals with facial deviations were often subjected to teasing, nicknaming, and social discrimination. In Tanzania, however, it is not uncommon to see people of various ages and varying levels of socioeconomic background smiling, untroubled by very serious occlusal irregularities from the professional point of view.

Generally, decisions concerning orthodontic treatment are made in childhood, and desire for treatment is usually influenced by parental attitudes and values. Peers and parents are the groups usually involved in the initiation of the individual's dissatisfaction with her/his teeth leading to orthodontic treatment demand, with peer group influences being more significant.<sup>10</sup> Concern of appearance is a basic motivational factor in seeking orthodontic treatment,<sup>11,12</sup> although other factors including peer group, social class, sex, and ethnicity have been reported.<sup>10,13</sup> On the other hand, parents have a major role to play and, therefore, knowledge about their perception of malocclusion is relevant.

The purpose of the study was to investigate and compare the opinions of Tanzanian children and those of their parents on dental attractiveness.

## SUBJECTS AND METHODS

### Subjects

The study was carried out in the city of Dar es Salaam, Tanzania. Two schools were selected randomly from a list

<sup>a</sup> Department of Preventive and Community Dentistry, Faculty of Dentistry, Muhimbili University College of Health Sciences, Dar es Salaam, Tanzania.

<sup>b</sup> Department of Orthodontics and Oral Biology, University Medical Center, Nijmegen, The Netherlands.

<sup>c</sup> Biostatistician, Department of Cariology and Preventive Dentistry, University Medical Center, Nijmegen, The Netherlands.

<sup>b</sup> Corresponding author: A. M. Kuijpers-Jagtman, DDS, PhD, Department of Orthodontics and Oral Biology, University Medical Centre Sint Radboud, University of Nijmegen, 6500 HB Nijmegen, The Netherlands (e-mail: a.kuijpers-jagtman@dent.umcn.nl).

Accepted: March 2003. Submitted: January 2003.

© 2004 by The EH Angle Education and Research Foundation, Inc.

of 180 public primary and four coeducational secondary schools, which was obtained from the City Council and the Ministry of Education authorities, respectively. In the two schools, classes were selected randomly, and 400 children, of whom 52% were girls and 48% were boys, were selected randomly from the classes for inclusion in the study. Inclusion criteria for the respondents were age at the time of the study (9–18 years), African-Tanzanian origin, and willingness to participate in the study. All respondents were asked to produce birth certificates, Maternal and Child Health birth cards, or any other evidence for age verification. Subsequently, parents of all the children participating in the study were asked to participate in the present study. Therefore, 400 children and their parents were expected to be involved. Of 400 parents, 291 (72.8%) responded to the questionnaire, and five questionnaires could not be used because of lack of data. Hence, the current report is based on the total sample of 286 school children (45% girls, 55% boys), aged 9–18 years, and their parents (68% women, 32% men).

The Ministry of Education of Tanzania, the City Commission of Dar es Salaam, as well as the school authorities gave permission to conduct the study in the selected schools, and the parents and children were informed in writing, after which both could decide whether to participate in the study.

## Methods

Two separate prestructured questionnaires in a common, locally well-understood and spoken language (Swahili) were given to the children and their parents. Children and their parents completed the questionnaire separately, and the questionnaire for the children was given in their classrooms at their respective schools. Children completed the questionnaire in the presence of one of the investigators (E. A. Mugonzibwa), and they were instructed to ask for clarification whenever they could not understand anything in the questionnaire. Although the instructions were attached to the questionnaire, the investigator repeated the instructions to the pupils just before they completed the questionnaire. The questionnaire for the parents was sent home through their children with an introduction letter in Swahili explaining the purpose of the study and giving instructions for filling-in the questionnaire. The letter also requested that wherever possible, mothers should respond to the questionnaire. If it was not possible for the mother or female guardian to respond to the questionnaire, then the father or male guardian was suggested as an alternative.

For both questionnaires, the first part referred to the demographic characteristics of the respondents. The second part pertained to the respondents' perception of malocclusion and consisted of questions related to 18 intraoral frontal photographs (Figure 1) in response to which they had to give an opinion on the dental attractiveness of the oc-

clusion seen on the photograph. The photographs represented various types of occlusion traits, with the first 10 intraoral photographs representing grade 1–10 of the esthetic component (AC) of the index of orthodontic treatment need (IOTN). The photographs were taken from the archives of slides from orthodontic patients. The AC of the IOTN rates the person's dental attractiveness on a 10-point scale, as illustrated by intraoral photographs.<sup>14</sup> Eight intraoral photographs were added to represent malocclusions that are often seen in Tanzania. There were three questions for each photograph ( $18 \times 3 = 54$  items), which are listed in Table 1. The first two questions assessed the respondents' perception on the attractiveness of the 18 intraoral photographs. The third question determined the gender preference of the respondents for the occlusion presented on the photographs. A clinical examination of the children was conducted by an investigator (E. A. Mugonzibwa), but the findings are reported elsewhere.<sup>15</sup>

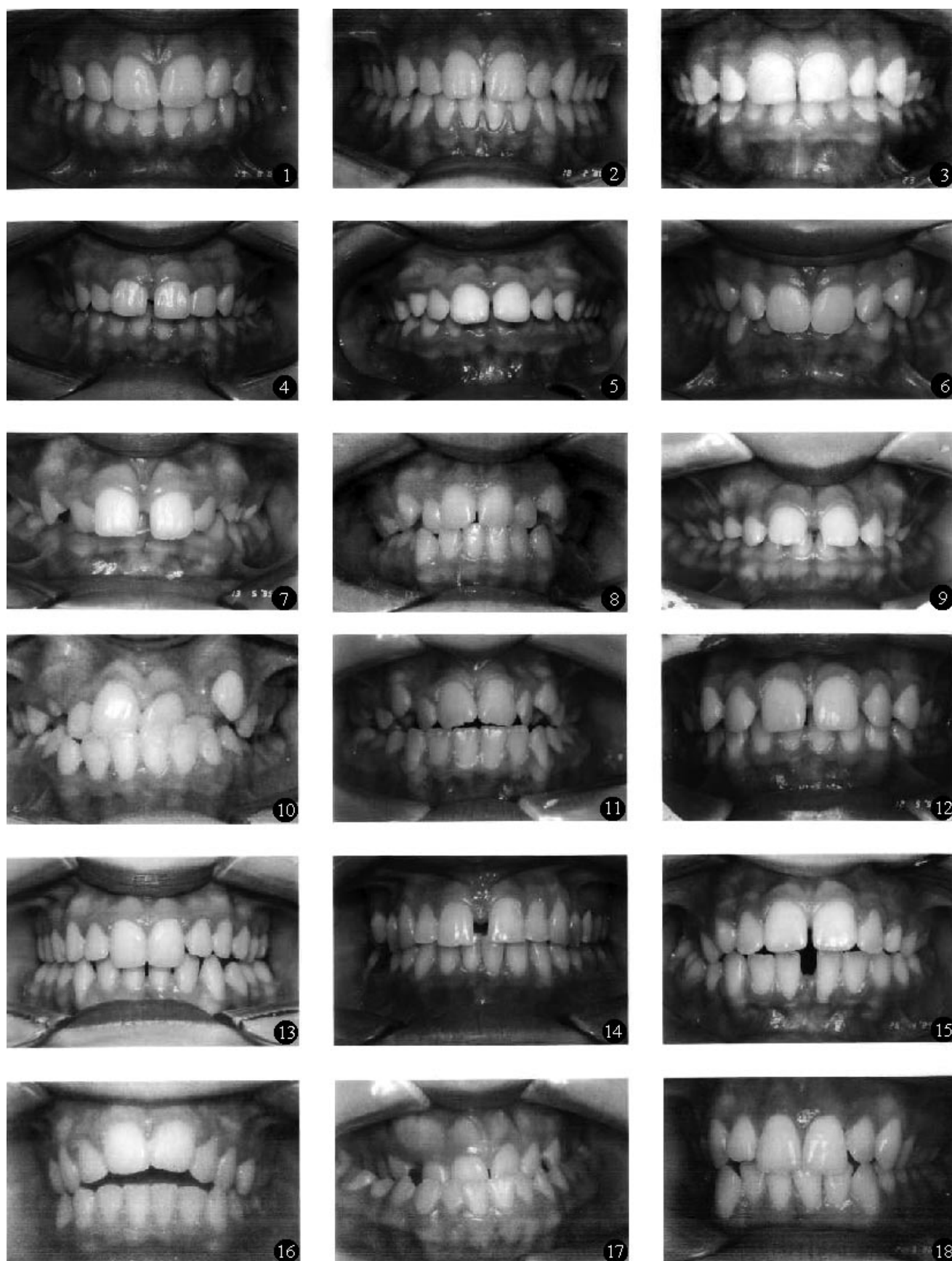
Data processing and analyses were carried out using the statistical package SPSS.<sup>16</sup> Paired *t*-test, and Pearson's and Spearman's correlation coefficients were used to study the influences of the opinion. The first two questions for the 18 intraoral photographs ( $18 \text{ photographs} \times 2 \text{ questions} = 36$  items) were subjected to principal component analyses. Frequencies and means for various variables were obtained. Correlations between various variables including factors were calculated.

## RESULTS

Demographic characteristics of the respondents are presented in Table 2. About one fifth of the mothers had received primary education or below. Most parents had received secondary education.

A principal component analysis (PCA) was done on the total sample of 386 children, and four factors were generated for the children's opinion on the 18 intraoral photographs that could be clearly interpreted.<sup>16</sup> The 36 items ( $18 \text{ photographs} \times 2 \text{ questions}$ ) in each sample were reduced to four factors: (1) photographs showing normal occlusion; (2) photographs showing some varying degree of spacing with overbite  $\leq 2$  mm or open bite; (3) photographs showing some varying degree of spacing with overbite  $> 2$  mm; and (4) photographs showing severe deviations. Also, for the four factors, the sample of 286 parents and their children gave high reliabilities (Cronbach's alpha ranging from 0.68 to 0.89) for both children and parents as shown in Table 3.

Table 4 shows the mean scores for the respondents' opinion on the 18 intraoral frontal photographs for the two questions. Both children and parents considered photographs showing severe deviations, including crowding (factor 4), as unattractive. The respondents generally liked the photographs of dentitions showing normal occlusion (factor 1), whereas the means for the opinion on the photographs



**FIGURE 1.** Intraoral frontal photographs used in the present study.

**TABLE 1.** Questions on Dental Attractiveness and Gender Preference and their 5-point Scale Alternatives

Children				
1. The teeth arrangement in this photograph is:				
1 = Very good looking; 2 = Good looking; 3 = Satisfactory;				
4 = Not Good; 5 = Not good at all				
2. Would you be happy if the arrangement of your teeth was like in this photograph?				
1 = Very happy; 2 = Happy; 3 = Normal; 4 = Unhappy;				
5 = Very unhappy				
3. The teeth arrangement in this photograph is good for:				
1 = A girl; 2 = A boy; 3 = Any; 4 = Do not know;				
5 = Cannot judge				
Parents				
1. The teeth arrangement in this photograph number is:				
1 = Very good looking; 2 = Good looking; 3 = Satisfactory;				
4 = Not good; 5 = Not good at all				
2. Would you be happy if the arrangement of your child's teeth was like in this photograph?				
1 = Very happy; 2 = Happy; 3 = Normal; 4 = Unhappy;				
5 = Very unhappy				
3. The teeth arrangement in this photograph is good for:				
1 = A girl; 2 = A boy; 3 = Any; 4 = Do not know;				
5 = Cannot judge				

**TABLE 2.** Demographic Characteristics of the Respondents

	Girls		Boys	
	n	%	n	%
Respondents				
Children 9–12 years	61	21	68	24
Children 13–18 years	68	24	89	31
Children total	129	45	157	55
Parents	192	68	94	32
Parents' educational status				
Primary education and below	64	23	24	8
Secondary education	109	39	39	13
University education	12	4	26	9
Unknown	7	2	5	2

showing spacing with overbite  $\leq 2$  mm or open bite (factor 2) and spacing with overbite  $> 2$  mm (factor 3) fell in the middle of the scale, with a tendency toward unattractiveness. For the question, 'would you be happy if the arrangement of your teeth was like in this photograph,' the answers were comparable. Whenever there was a significant difference between the opinions of children and parents, children

had a larger mean score (ie, less attractive), except for the photographs showing severe deviations, including crowding. The parents' educational status was not correlated with the opinions of both children and parents on the dental attractiveness of the 18 intraoral frontal photographs. However, the opinion was significantly correlated with children's age ( $P = .02$ ) and sex ( $P < .0005$ ), with older girls tending to dislike photographs showing severe deviations the most.

Figure 2 shows the respondents' ranking of the first 10 intraoral photographs according to their answers for the two questions concerning attractiveness. The conventional categories of the AC of the IOTN are given in the middle bar. Only those categories that were ranked differently from the conventional ones by either parents or children are shown by an arrow. Parents' and children's Spearman's rank correlations were  $r = 0.88$  ( $P < .001$ ) and  $r = 0.90$  ( $P < .0001$ ), respectively. The collective parents and children's Spearman's rank correlation was  $r = 0.80$  ( $P < .005$ ). For only two photographs, the ranking by parents or children caused a change of category for treatment need. Photographs 5 and 9 for the children and 7 and 9 for the parents were interchanged between categories of treatment need according to the AC of the IOTN.

Figures 3 and 4 show the parents' and children's gender preference for the occlusion traits in the 18 intraoral frontal photographs (question 3). Proportions of the respondents who made a gender preference for the photographs varied. About a quarter of the parents and children made a gender preference for photographs 1, 2, 3, 4, 12, 13, 14, and 15 with dentitions showing good occlusion. About 23% of the children and 36% of the parents preferred photographs 4 and 14 with a maxillary central diastema in common for a girl compared with 7%–9% and 5%–6% for a boy, respectively. However, 23%–27% of the children and 33% of the parents did not prefer the same photographs for any sex. Generally, children preferred photographs showing some spacing or central diastema for a girl, whereas parents preferred them for a girl or for both sexes. Respondents ranging from about 10% to 90% of the parents and 23% to 77% of the children had no gender preference for the photographs.

## DISCUSSION

The social background of the respondents was not asked in detail, but Tanzanian public schools generally have chil-

**TABLE 3.** Description of the Four Factors for the Opinion of the Children and Parents on 18 Intra-oral Photographs

Factor	Description	Photographs	Cronbach's Alpha	
			Children's	Parents'
1	Normal	1, 2	0.87	0.68
2	Spacing with overbite $\leq 2$ mm or open bite	12–16	0.70	0.89
3	Spacing with overbite $> 2$ mm	3–7, 9	0.89	0.89
4	Severe deviations	8, 10, 11, 17, 18	0.88	0.86



TABLE 4. The Mean and Standard Deviation for the Children's and Parents' Opinion on the 18 Intra-oral Frontal Photographs

Factor (Photographs)	Attractiveness <sup>a</sup>			Happiness <sup>b</sup>		
	Mean ± SD		P Value	Mean ± SD		P Value
	Children	Parents		Children	Parents	
Normal (1, 2)	2.3 ± 1.1	2.0 ± 0.9	.001	2.4 ± 1.2	2.2 ± 1.0	NS <sup>c</sup>
	2.4 ± 1.1	2.3 ± 0.9	NS	2.6 ± 1.1	2.4 ± 1.0	.04
Spacing with overbite ≤2 mm or open bite (12–16)	3.3 ± 1.1	3.2 ± 0.8	NS	3.4 ± 1.1	3.3 ± 0.8	NS
	3.0 ± 1.2	2.9 ± 1.0	NS	3.1 ± 1.2	3.0 ± 1.0	NS
	3.2 ± 1.2	2.9 ± 1.0	.001	3.3 ± 1.2	3.0 ± 1.0	.001
	3.6 ± 1.0	3.3 ± 1.0	.001	3.7 ± 1.0	3.4 ± 0.9	.001
	3.7 ± 1.1	3.9 ± 0.8	NS	3.7 ± 1.1	3.9 ± 0.8	NS
Spacing with overbite >2 mm (3–7, 9)	3.4 ± 1.0	3.2 ± 0.8	.008	3.5 ± 1.0	3.2 ± 0.8	.004
	3.4 ± 1.1	3.1 ± 0.9	.001	3.4 ± 1.1	3.2 ± 0.9	.002
	3.8 ± 0.9	3.7 ± 0.8	.014	3.9 ± 0.9	3.7 ± 0.8	.016
	3.7 ± 1.0	3.8 ± 0.8	NS	3.7 ± 0.1	3.8 ± 0.8	NS
	4.4 ± 0.8	4.3 ± 0.6	NS	4.3 ± 0.8	4.3 ± 0.7	NS
	4.0 ± 0.8	3.7 ± 0.8	.001	4.0 ± 0.9	3.8 ± 0.8	.018
Severe deviations (8, 10, 11, 17, 18)	3.5 ± 1.2	4.0 ± 0.8	.001	3.5 ± 1.2	4.0 ± 0.8	.001
	4.6 ± 0.7	4.7 ± 0.5	.005	4.5 ± 0.8	4.7 ± 0.5	.002
	4.0 ± 1.0	4.3 ± 0.7	.001	4.0 ± 0.9	4.3 ± 0.7	.001
	4.4 ± 0.8	4.4 ± 0.7	NS	4.3 ± 1.0	4.4 ± 0.7	NS
	4.0 ± 1.0	4.0 ± 0.7	NS	4.0 ± 0.9	4.0 ± 0.8	NS

<sup>a</sup> Question 1. 1 = very good looking, 2 = good looking, 3 = satisfactory, 4 = not good, and 5 = not good at all.  
<sup>b</sup> Question 2. 1 = very happy, 2 = happy, 3 = normal, 4 = unhappy, and 5 = very unhappy.  
<sup>c</sup> NS = Not significant.

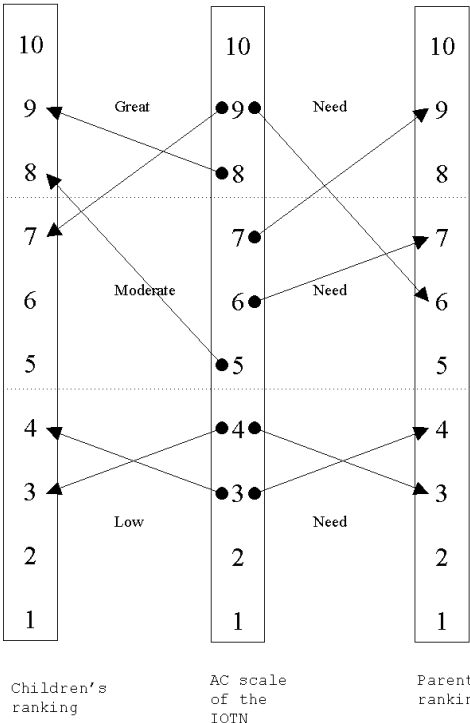


FIGURE 2. Respondents ranking of the first 10 photographs.

dren from a wide range of social background. Although the sample is not representative of the whole Tanzanian population for the studied groups of respondents, it gives an overview of the opinion of children and parents on dental

attractiveness in the Tanzanian community. The response rate to the questionnaire for the children was excellent, 100%, and most of the returned questionnaires (96.5%) could be used in the data analyses.

The parents' response rate to the questionnaire was acceptable, 73%. The posting of the questionnaires to the parents through their children, the length of the questionnaire, and the voluntary basis of participation may have influenced the response rate of the parents to the questionnaire. In such circumstances, the inactive, busy, and introvert individuals are unlikely to respond. Also, the response to the questionnaire was not anonymous, which might have hindered some respondents from giving detailed information.

This study indicated that both parents and children perceived photographs with severe deviations as the most unattractive. However, the parents scored significantly higher means than the children for the photographs showing severe deviations, indicating that they recognized the definite need for orthodontic treatment more clearly than did their children. The finding supports the role parents may have in shaping the orthodontic norms in the Tanzanian society. Generally, the results are parallel to previous studies using photographs showing severe deviations, including crowding.<sup>5,8,17</sup> The respondents perceived photographs 1 and 2 that represented photographs 1 and 2 on the AC scale of the IOTN and showed good occlusion as the most attractive, suggesting that the public seems to agree that the professionally determined normal occlusion is esthetically most pleasing.<sup>18–22</sup> In Tanzania, most of the parents' deci-

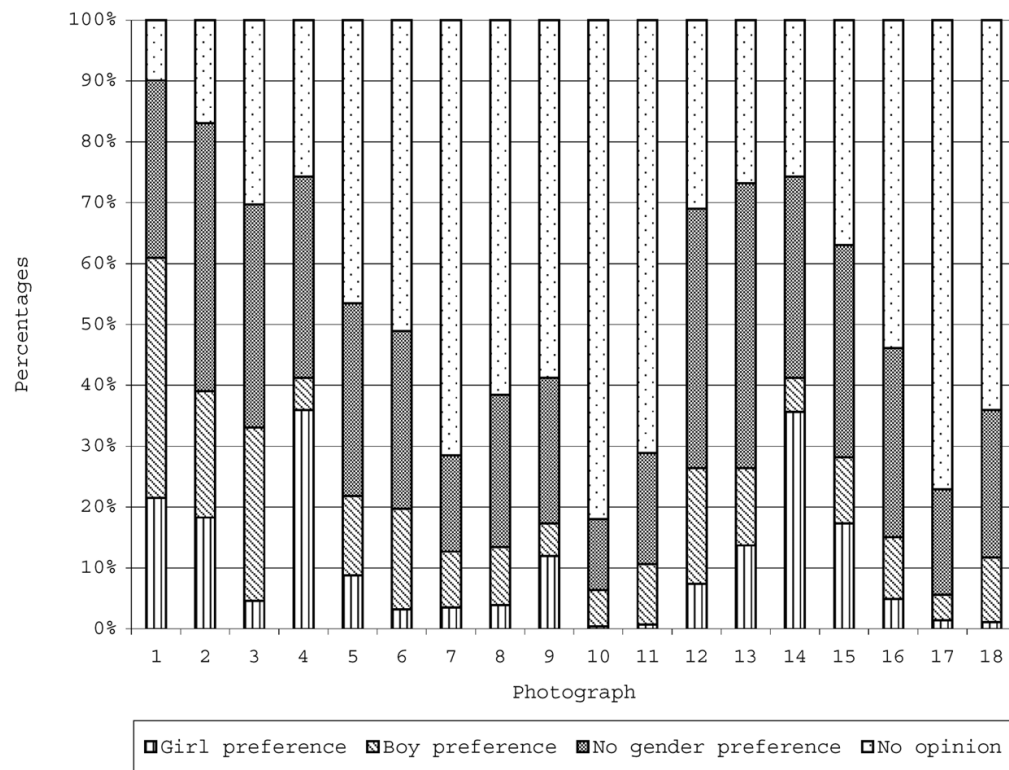


FIGURE 3. Parents' gender preference for the photographs.

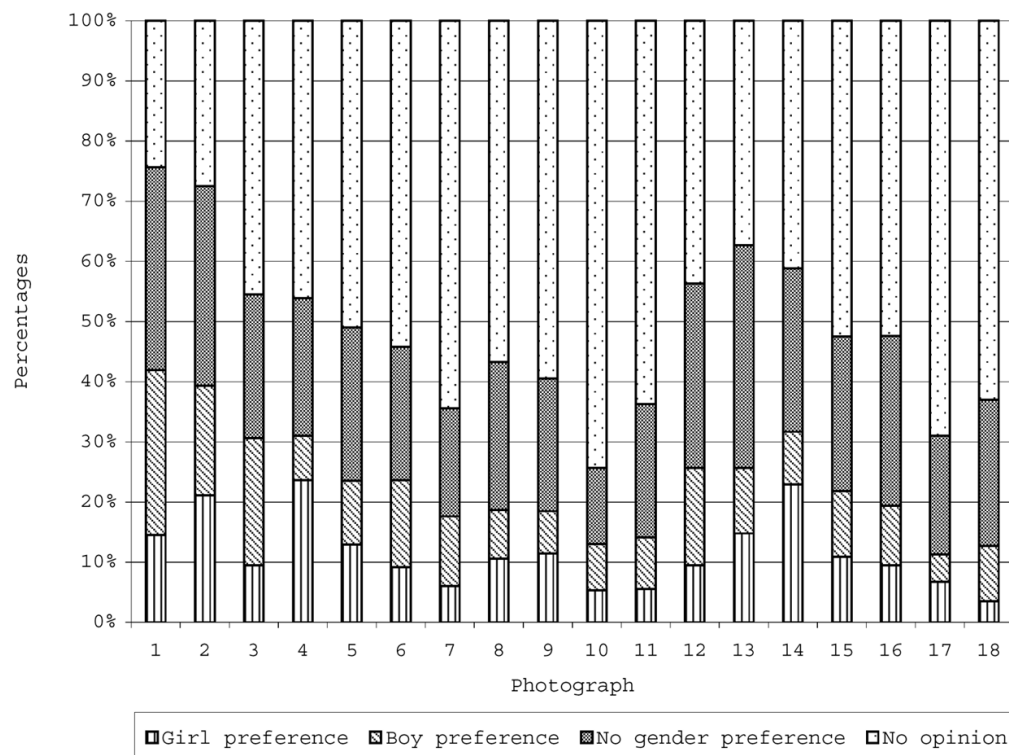


FIGURE 4. Children's gender preference for the photographs.

sions about orthodontic treatment are not based on the advice of dental professionals because there is no organized orthodontic health care program. Although the society as a whole is less exposed to an orthodontic treatment environment, parents seem to have their own subjective judgment as to the contribution of the collective esthetic attributes of the teeth toward attractiveness.

Spacing with or without excessive overbite or open bite fell in the middle of the scale with only a tendency toward unattractiveness. Africans are believed to consider spacing as attractive, but this was not confirmed by our study. On the other hand, prevalence of spacing in this society ranges from 24% to 56%.<sup>23–26</sup> Therefore, spacing may be accepted as a society norm because of its high prevalence. With globalization, through television, films, newspapers, and magazines, providing daily reinforcement for global facial stereotypes,<sup>27,28</sup> people may have a common basis for dental esthetic judgment, regardless of their nationality, age, sex, occupation, or geographical distance.<sup>29–31</sup> Because this study was carried out in the urban population, this could have influenced our findings.

In the present study, the ranking of the intraoral photographs by parents and children did not exactly match with the conventional AC scale. Some photographs were interchanged between the borderline and a great need for treatment categories, indicating a difference of opinion between Tanzanian respondents and people in societies at the time when the AC scale of the IOTN was developed with regard to the particular occlusion attractiveness.

Most parents and children made gender preferences for photographs showing normal occlusion. But as soon as the malocclusion was more severe, the proportion of parents and children making no gender preference increased. Photographs showing spacing or central diastema were most preferred for a girl by children, whereas parents preferred them for a girl or for both sexes. Although these findings tend to support the preexisting belief that in African societies central diastema is considered as a sign of beauty, it did not come out strongly. Further research on this issue in the Tanzanian cultural community, involving both urban and rural samples, would be interesting.

## CONCLUSIONS

The results indicate that severe deviations, including space deficiency irregularities, were perceived by parents and children as the most unattractive compared with other occlusal anomalies, including open bite, suggesting that from their point of view, grades 8–10 of the AC scale of the IOTN could be given the first priority when considering an orthodontic treatment policy in Tanzania. Because the societal perception of malocclusion, on which orthodontic treatment standards are based, in the country may vary, more comparative studies should be done to assess the perception of malocclusion in different regions.

## REFERENCES

1. Farrow AL, Zarrinnia K, Azizi K. Bimaxillary protrusion in black Americans: an esthetic evaluation and the treatment considerations. *Am J Orthod Dentofacial Orthop.* 1993;104:240–250.
2. Polk MS, Farman AG, Yancey JA, Gholston LR, Johnson BE, Regennitter FJ. Soft tissue profile: a survey of African American preferences. *Am J Orthod Dentofacial Orthop.* 1995;108:90–101.
3. Mantzikos T. Esthetic soft tissue profile preferences among the Japanese population. *Am J Orthod Dentofacial Orthop.* 1998;114:1–7.
4. Helm S, Petersen PE, Kreiborg S, Solow B. Effect of separate malocclusion traits on concern for dental appearance. *Community Dent Oral Epidemiol.* 1986;14:217–220.
5. Kerosuo H, Hausen H, Laine T, Shaw WC. The influence of incisal malocclusion on the social attractiveness of young adults in Finland. *Eur J Orthod.* 1995;17:505–512.
6. Shaw WC, Meek SC, Jones DS. Nicknames, teasing, harassment and the salience of dental features among school children. *Br J Orthod.* 1980;7:75–80.
7. Shaw WC. Factors influencing the desire for orthodontic treatment. *Eur J Orthod.* 1981;3:151–162.
8. Shaw WC, Rees G, Dawe M, Charles CR. The influence of dentofacial appearance on the social attractiveness of young adults. *Am J Orthod.* 1985;87:21–26.
9. Phillips C, Hill BJ, Cannac C. The influence of video imaging on patients' perceptions and expectations. *Angle Orthod.* 1995;65:263–270.
10. Burden DJ. The influence of social class, gender and peers on the uptake of orthodontic treatment. *Eur J Orthod.* 1995;17:199–203.
11. Tulloch JFC, Shaw WC, Smith A. A comparison of attitudes towards orthodontic treatment in British and American communities. *Am J Orthod.* 1984;85:253–259.
12. Gosney MB. An investigation into some of the factors influencing the desire for orthodontic treatment. *Br J Orthod.* 1986;13:87–94.
13. Ahmed B, Gilthope MS, Bedi R. Agreement between normative and perceived orthodontic need amongst deprived multiethnic school children in London. *Clin Orthod Res.* 2001;4:65–71.
14. Evans R, Shaw WC. Preliminary evaluation of an illustrated scale for rating dental attractiveness. *Eur J Orthod.* 1987;9:314–318.
15. Mugonzibwa EA, Kuijpers-Jagtman AM, van't Hof MA, Kikwili EN. Opinion on dental attractiveness and perception of orthodontic treatment need amongst Tanzanian children. *Am J Orthod Dentofacial Orthop.* In press.
16. SPSS Inc. The Statistical Package for the Social Sciences. Chicago (IL): SPSS, 1990.
17. Soh G, Lew K. Assessment of orthodontic treatment needs by teenagers in an Asian community in Singapore. *Community Dent Health.* 1992;9:57–62.
18. Peck H, Peck S. A concept of facial esthetics. *Angle Orthod.* 1970;40:284–318.
19. Sergl HG, Stodt W. Experimental investigation of the aesthetic effect of various tooth positions after loss of an incisor tooth. *Trans Eur Orthod. Soc.* 1970;497–507.
20. Shaw WC, Lewis HG, Robertson NRE. Perception of malocclusion. *Br Dent J.* 1975;138:211–216.
21. Prahl-Andersen B, Boersma H, Van der Linden FPGM, Moore AW. Perceptions of dentofacial morphology by laypersons, general dentists, and orthodontists. *J Am Dent Assoc.* 1979;98:209–212.
22. Espeland LV, Stenvik A. Orthodontically treated young adults: awareness of their own dental arrangement. *Eur J Orthod.* 1991;13:7–14.
23. Mugonzibwa EA, Mumghamba E, Rugarabamu P, Kimaro S. Occlusal and space characteristics among 12 year old schoolchildren in Bukoba and Moshi, Tanzania. *Afr Dent J.* 1990;4:6–10.

24. Mugonzibwa EA. Variation in occlusal and space characteristics in a series of 6- to 18-year-olds, in Ilala district, Tanzania. *Afr Dent J.* 1992;6:17–22.
25. Mugonzibwa EA. Occlusion survey in a group of Tanzanian adults. *Afr Dent J.* 1993;7:6–10.
26. Mugonzibwa EA, Kuijpers-Jagtman AM, Eskeli R, Laine-Alava MT, van't Hof MA. Spacing and crowding among African and Caucasian children. *Community Dent Oral Health.* In press.
27. Ford CS, Prothro ET, Child IL. Some trans-cultural comparisons of esthetic judgement. *J Pers Soc Psychol.* 1966;68:19–26.
28. Child IL, Iwao S. Personality and esthetic sensitivity: extension of findings to younger ages and to different cultures. *J Pers Soc Psychol.* 1968;8:308–312.
29. Cons NC, Jenny J, Kohout FJ, Freer TJ, Eismann D. Perceptions of occlusal conditions in Australia, the German Democratic Republic and the United States of America. *Int Dent J.* 1983;33:200–206.
30. De Smit A, Dermaut L. Soft tissue profile preference. *Am J Orthod.* 1984;86:67–73.
31. Cons NC, Jenny J. Comparing perceptions of dental esthetics in the USA with eleven ethnic groups. *Int Dent J.* 1994;44:489–494.