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Self-Concept and the Perception of Facial Appearance in Children and Adolescents Seeking Orthodontic Treatment

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Abstract

Objective—To examine, in adolescents with mild to moderate malocclusion, the relationship between self-concept and demographic characteristics, a clinical assessment of malocclusion, self-perception of malocclusion, and self-perception of facial attractiveness.

Methods and Materials—Fifty-nine consecutive patients ages 9 to 15 years scheduled for initial records in a graduate orthodontic clinic consented to participate. Each subject independently completed the Multidimensional Self-Concept Scale (MSCS), the Facial Image Scale, and the Index of Treatment Need–Aesthetic Component (IOTN-AC). Peer Assessment Rating (PAR) scores were obtained from the patients' diagnostic dental casts. Forward multiple-regression analysis with a backward overlook was used to analyze the effect of the demographic, clinical, and self-perception measures on each of the six self-concept (MSCS) domains.

Results—Self-perception of the dentofacial region was the only statistically significant predictor ($P < .05$) for the Global, Competence, Affect, Academic, and Physical domains of self-concept, while age, parental marital status, and the adolescent's self-perception of the dentofacial region were statistically significant predictors ($P < .05$) of Social Self-Concept.

Conclusion—The self-perceived level of the attractiveness or "positive" feelings toward the dentofacial region is more strongly related to self-concept than the severity of the malocclusion as indicated by the PAR score or by the adolescent's perception of their malocclusion.

Keywords

Adolescents; Facial attractiveness; Self-concept; Index of Treatment Need–Aesthetic Component; Peer Assessment Rating

INTRODUCTION

It has long been recognized that the dentofacial region contributes significantly to overall facial appearance.[1] Adults with extreme overjet, deep bite, and crowding, whether or not they have previously received orthodontic treatment, have reported significantly lower self-concept ratings[2] than those without malocclusion. One study of adults[3] with skeletal disharmonies found that more than a third of the subjects reported that they had experienced substantial distress and personal insecurity caused by their appearance.

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Facial attractiveness of children and adolescents as judged by peers or teachers has been positively associated with grade point average, positive peer relations, and social acceptance.[4–8] However, Rivera et al[9] reported that children and adolescents with malocclusion generally have both positive self-concept and positive self-esteem and that the body image of these subjects did not differ from that of the general population. For those patients with low self-concept or low self-esteem, it appeared that the child's own perception of the severity of his/her malocclusion, not the clinical assessment, was the more important contributing factor to self-concept and self-esteem.[9] Other studies have supported the finding that the clinical extent of the malocclusion does not appear to be related to self-concept[10–12] or self-esteem[13] in preadolescents and adolescents.

The purpose of this study was to examine the relationship between self-concept and a clinical assessment of malocclusion in adolescents with mild to moderate malocclusion, their demographic characteristics, and their self-perception of facial attractiveness and malocclusion.

MATERIALS AND METHODS

Subjects

Consecutive patients scheduled for diagnostic records in a graduate orthodontic clinic during a 6-month period were recruited. Subjects gave written consent and a parent signed permission forms approved by the institutional review board. Inclusion criteria were as follows: age 9 to 15, enrollment in the fourth through the eighth grade at the time of initial assessment, and a minimum of a third-grade reading level in English. Patients were excluded if they had a craniofacial or congenital anomaly, a systemic medical condition that might affect physical or emotional growth, a history of or current medication for a psychiatric disorder, a history of facial surgery, or fixed or removable orthodontic appliances present at the time of enrollment.

Data were collected after diagnostic records were obtained but prior to the initiation (including separators) of orthodontic treatment. Participants were compensated US$10, and a voucher for 1 hour of free parking was provided.

Self-Report Instruments

The patients completed the following questionnaires independently of their parents. A study coordinator was available throughout the session to answer questions.

The Multidimensional Self-Concept Scale (MSCS)[14] measures global self-concept and six specific domains of self-concept: Social, Competence, Affect, Academic, Family, and Physical. Each domain consists of 25 items. Each item is scored from 1 (strongly agree) to 4 (strongly disagree). Negatively worded items were reverse scored. The raw global score and domain scores were calculated as sums of all items or of domain-specific items. The global and domain scores were then standardized (IQ metric) using the standard score conversions available in the user manual. A higher score indicates a more positive self-concept.

The Facial Image Scale (FI)[15] measures a subject's feelings about certain features or areas of the face. Subjects rate 13 items on a five-point scale ranging from strong negative feelings (1) to strong positive feelings (5). The Dentofacial subscale score, calculated as the average of the scores of six features (mouth, teeth, chin, profile, smile, and lips), was used in this study. Higher scores indicate a more positive dentofacial image.

The Index of Orthodontic Treatment Need–Aesthetic Component (IOTN-AC)[16] was developed to provide a reliable method of ranking malocclusions based on occlusal characteristics. Without the aid of a mirror, photograph, or models, subjects were asked to

identify which photograph from a set of ten he or she thought most closely represents their dental arrangement. The photographs were presented to subjects in random order.

Clinical Measure of Malocclusion Severity

The Peer Assessment Rating (PAR) was designed to provide a quantitative, objective method of scoring dental casts to grade malocclusion,[17] with higher scores indicating greater degrees of malocclusion. Each diagnostic model was scored by two calibrated examiners. English weighting was used to calculate the PAR score, since the English weighting system incorporates mandibular as well as maxillary alignment.

Statistical Analysis

Bivariate relationships among the pretreatment clinical and patient self-report measures were examined by Pearson correlation. The multivariate relationship of each of the six self-concept domains with demographic characteristics (age, gender, parental marital status), clinical assessment of malocclusion (PAR), self-perception of malocclusion (IOTN-AC), and self-perception of dentofacial attractiveness (Dentofacial-FI) were examined using forward multiple-regression analysis with a backward overlook (SAS Proc Reg, Cary, NC). The level of significance for all analyses was set at .05.

RESULTS

Sixty-nine subjects gave approval and received parental permission to participate. Ten subjects failed to keep their appointment to complete the questionnaires prior to initiation of treatment and were not included in the data analysis. The average age was 12.2 years, and the majority of the participants were in the sixth or seventh grades; 56% of the subjects were female. Only 12% were nonwhite (Table 1). The ten who did not attend their appointment were similar in demographic characteristics to those who completed the data collection (average age = 12.8 years; 50% female).

All of the participants had been clinically judged as needing orthodontic treatment (Table 1). The average PAR score was 32.4 (range, 12 to 63). The average overjet was 3.4 mm (range, 0 to 9 mm) and the average overbite was 3.3 mm (range, −3 to 8 mm). Approximately two thirds of the subjects perceived their malocclusion as mild, as indicated by their selection from the IOTN-AC photographs (Table 2). Prior to treatment, the average Dentofacial-FI was 3.5 (Table 2), similar to that of other treatment-seeking groups.[15] The mean global MSCS self-concept score and the mean domain scores for all six areas of self-concept were in the average range[14] (Table 2).

Age was inversely related to Dentofacial-FI ($r = -0.32$; $P = .01$); younger subjects tended to rate their dentofacial appearance more positively than older subjects. The adolescents' self-perceptions of their malocclusion (IOTN-AC) were not correlated with their Dentofacial-FI ($r = -0.10$; $P = .46$). PAR was not correlated with IOTN-AC ($r = -0.05$; $P = .73$) or the Dentofacial-FI subscale ($r = -0.19$; $P = .14$), suggesting that the clinical indicator of the severity of the malocclusion was not associated with the subject's perception of his or her malocclusion or dentofacial attractiveness.

In an examination of the simple bivariate relationships, the global and domain-specific self-concept scores were not significantly correlated with any of the demographic characteristics or with subjects' perceptions of the severity of malocclusion (IOTN-AC). Dentofacial-FI was statistically significantly correlated with global self-concept and all self-concept domains except for Family Self-Concept (Table 3). PAR was not significantly correlated with the global or domain-specific self-concept measures (Table 3).

For Global, Competence, Affect, Academic, and Physical Self-Concept, self-perception of the dentofacial region score (Dentofacial-FI) was the only statistically significant predictor. Dentofacial-FI explained 8% of the variability in Academic Self-Concept; 14% of Affect Self-Concept; and 16% to 19% of Global, Competence, and Physical Self-Concept. Self-concept in these domains increased with more positive self-perception of the dentofacial region. The demographic characteristics (age, gender, parental marital status), the clinical assessment of the malocclusion (PAR), and the subject's perception of his or her malocclusion (IOTN-AC) did not contribute significantly to the explanation of the variability in these domains or in Global Self-Concept. Dentofacial-FI explained 13% of the variability in Social Self-Concept, parental marital status explained an additional 8% of the variability, and age accounted for an additional 4% of variability. Social Self-Concept improved with more positive self-perception of the dentofacial region and with age. Social Self-Concept was lower, on average, for children in two-parent families. Family Self-Concept was not significantly related to any of the explanatory variables.

DISCUSSION

As children grow and interact with various environments, they begin to develop differentiated self-concepts that are specific to different areas of their life. This process begins in early childhood and accelerates during the junior high and high school years.[14] Self-concept is generally thought to represent a learned, organized response pattern[18] that incorporates the reactions of other people, the positive and negative experiences of the child, and the child's ability to achieve his or her goals and objectives.[14] Success or failure in various endeavors, the reaction of others to their efforts, and their reactions to peer and family evaluations of themselves as well their perceived “place” in social networks such as school lead children to make generalizations about their competence in each of the self-concept areas or domains.[14]

Many orthodontists can cite anecdotes or clinical experiences as “evidence” that malocclusion can have a negative impact on an individual's psychologic well-being or self-concept; however, studies that have assessed self-concept in preadolescents and adolescents with malocclusion have suggested that no negative relationship exists prior to treatment.[9–11,13,19] Several issues, however, complicate the interpretation of this negative relationship: the definition of “self-concept” has varied from study to study; a concept of “body image” that incorporates nonfacial characteristics, rather than a measure that focuses on the perceived attractiveness of the “dentofacial” image, has been used as an indicator of a subject's perception of his or her attractiveness; and clinical measures of “malocclusion” have been used, rather than self-assessment, as the “predictor” of self-concept.[12]

In spite of the varying methodology used to examine the relationship between physical attractiveness and self-concept, it appears that desirable characteristics, including popularity and friendship, are often attributed to attractive people.[4] Because of the natural tendency for comparison with others, individuals who feel that there is a discrepancy between their view of self and the perception of others can experience discomfort and/or embarrassment.[20] Indeed, for some individuals a minor physical defect may be more of a negative influence on self-concept than a major inherited or accident-related facial deformity, either because of heightened “body awareness”[20] or because the timing of negative feedback from others is irregular and often unexpected.[21]

In this study, the self-perception of dentofacial attractiveness was significantly related to all self-concept domains except for family, explaining between 8% and 19% of the variability in academic, affect, competence, social, and physical self-concept. The development of physical self-concept is thought to be based on the perceived “reactions of others, as well as the comparisons a child makes of his/her physical attributes relative to (those) of others.”[14] The

finding in this study that the strongest relationship of Dentofacial-FI was with physical self-concept is consistent with that view. It would seem reasonable to suggest that self-concept issues are more likely related to an adolescent's own self-adjustment and overall self-perception of the dentofacial region, rather than strictly to his or her mal-occlusion. Although the IOTN-AC purportedly captures the subject's perception, the teeth are viewed in isolation, not in the context of other attributes in the dentofacial region that the preadolescent or adolescent may view positively or negatively. This study's findings support the conclusions of Jovanovic et al[22] that there are “positive implications of self-perceptions of attractiveness for individual adjustment across the junior high school transition.”

CONCLUSIONS

• The self-perceived level of the attractiveness or “positive” feelings toward the dentofacial region is a more important factor contributing to self-concept in preadolescents and adolescents than the self-perceived severity of the malocclusion alone (IOTN-AC) or an objective measure of the malocclusion as scored by the clinician (PAR).

REFERENCES

1. Shaw WC. The influence of children's dentofacial appearance on their social attractiveness as judged by peers and lay adults. Am J Orthod Dentofacial Orthop 1981;79:399–415.
2. Helm S, Kreiborg S, Solow B. Psychological implications of malocclusion: a 15-year follow-up study in 30-year-old Danes. Am J Orthod Dentofacial Orthop 1985;87:110–118.
3. Sergl HG, Zentner A. Study of psychosocial aspects of adult orthodontic treatment. Int J Adult Orthod 1997;12:17–22.
4. Perkins DF, Lerner RM. Single and multiple indicators of physical attractiveness and psychosocial behaviors among young adolescents. J Early Adolesc 1995;15:269–298.
5. Serketich WJ, Dumas JE. Adults’ perception of the behavior of competent and dysfunctional children based on the children's physical appearance. Behav Modif 1997;21:457–469. [PubMed: 9337601]
6. Jackson LA, Hunter JE, Hodge CN. Physical attractiveness and intellectual competence: a meta-analytic review. Soc Psychol Q 1995;58:108–122.
7. Shaw WC, Rees G, Dawe M, Charles C. The influence of dentofacial appearance on the social attractiveness of young adults. Am J Orthod Dentofacial Orthop 1985;87:21–26.
8. 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. [PubMed: 8682167]
9. Rivera SM, Hatch JP, Rugh JD. Psychological factors associated with orthodontic and orthognathic surgical treatment. Semin Orthod 2000;6:259–269.
10. Tung AW, Kiyak A. Psychological influences on the timing of orthodontic treatment. Am J Orthod Dentofacial Orthop 1998;113:29–39. [PubMed: 9457017]
11. Klima RJ, Witterman JK, McIver JE. Body image, self-concept, and the orthodontic patient. Am J Orthod 1979;75:507–515. [PubMed: 286552]
12. Dann C IV, Phillips C, Broder H, Tulloch JF. Self-concept, Class II malocclusion, and early treatment. Angle Orthod 1995;65:411–416. [PubMed: 8702066]
13. Albino JN, Lawrence SD, Tedesco LA. Psychological and social effects of orthodontic treatment. J Behav Med 1994;17:81–98. [PubMed: 8201614]
14. Bracken, BA. Multidimensional Self-Concept Scale Examiner's Manual. PRO-ED; Austin, TX: 1992.
15. Phillips, C.; Bennett, ME. Psychological ramifications of orthognathic surgery.. In: Fonseca, RJ., editor. Oral and Maxillo-facial Surgery. WB Saunders; Philadelphia, PA: 2000. p. 506-534.
16. Richmond, S.; O'Brien, K.; Buchanan, I.; Burden, D. An Introduction to Occlusal Indices. ORTHO-CARE (UK) Ltd; West Yorkshire, England: 1994.
17. Richmond S, Shaw WC, O'Brien K, Buchanan I, Jones R, Stephens C, Roberts CT, Andrews M. The development of the PAR (peer assessment rating) Index: reliability and validity. Eur J Orthod 1992;14:125–139. [PubMed: 1582457]

18. Crain RM, Bracken BA. Age, race, and gender differences in child and adolescent self-concept: evidence from a behavioral-acquisition, context-dependent model. School Psychol Rev 1994;23:164–171.

19. Dennington RJ, Korabik K. Self-concept changes in orthodontic patients during initial treatment. Am J Orthod 1977;72:416.

20. Kellet S, Gilbert P. Acne: a biopsychosocial and evolutionary perspective with a focus on shame. Br J Health Psychol 2001;6:1–24. [PubMed: 14596735]

21. Macgregor FC. Social and psychological implications of dentofacial disfigurement. Angle Orthod 1970;3:231–233. [PubMed: 5269955]

22. Jovanovic J, Lerner RM, Lerner JV. Objective and subjective attractiveness and early adolescent adjustment. J Adolesc 1989;12:225–229. [PubMed: 2768603]

Table 1
Demographic and Clinical Characteristics Prior to Treatment

Parameter	Percentage	Mean	SD
Demographic characteristics			
Caucasian	88%		
Female	56%		
Two-parent home	72%		
Grade level			
3–5	18%		
6–7	55%		
8–9	27%		
Age (y)		12.2	1.3
Clinical characteristics			
PAR (English weight)[a]		32.4	11.3
Overjet (mm)		3.4	1.9
Overbite (mm)		3.3	2.2

[a]PAR indicates Peer Assessment Rating.

Table 2

Descriptive Statistics of Subjects' Self-Concept and Self-Perception Scores Prior to Treatment

	Mean	SD	Percentage
Self-Concept[a]			
Global	107.9	14.3	
Social	104.5	14.2	
Competence	106.4	14.7	
Affect	108.0	14.5	
Academic	107.2	15.2	
Family	108.4	13.2	
Physical	104.3	12.8	
Dentofacial FI	3.5	0.9	
IOTN-AC[b]	4.1	2.3	
Mild (1−4)			68
Moderate (5−7)			19
Severe (8−10)			14

[a] Normalized using an IQ metric with mean = 100 and SD = 15.

[b] IOTN-AC indicates Index of Treatment Need, Aesthetic Component.

Table 3

Correlation Between MSCS Global and Domain-Specific Self-Concept and Demographic Characteristics, Clinical Assessment of Malocclusion (PAR), and Self-Perception of Facial Attractiveness (Dentofacial-FI) and Malocclusion (IOTN-AC)[a]

MSCS Domains	Gender	Parental Marital Status	Age	PAR	IOTN-AC	Dentofacial-FI
Global	.16	-.04	-.07	-.10	.04	.40***
Physical	.10	.02	-.10	.01	.09	.43***
Competence	.23	-.07	-.02	-.23	.06	.41***
Affect	.05	-.09	-.15	-.05	-.03	.37**
Social	.20	-.18	.14	-.06	-.05	.36**
Academic	.18	-.01	-.11	-.13	.01	.28*
Family	.11	.03	-.18	-.07	-.02	.21

[a]MSCS indicates Multidimensional Self-Concept Scale; PAR, Peer Assessment Rating; Dentofacial-FI, Dentofacial Subscale of the Facial Image Scale; IOTN-AC, Index of Treatment Need, Aesthetic Component.

*.01 < *P* < .05

**.001 < *P* < .01

****P* < .001.