

Impact of malocclusion on affective/romantic relationships among young adults

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ABSTRACT

Objective: To evaluate the extent to which different types of malocclusion influence the development of affective/romantic relationships among young adults of both sexes.

Materials and Methods: A cross-sectional study was conducted with 360 men and women ranging in age from 18 years to 25 years. Criteria for exclusion from the sample were the following: participants could not be married, visually impaired, or students of a higher education course in the area of health. In this study, images of young adult men and women in the same age range as that of the evaluators were used. These images were manipulated to create different types of malocclusion: diastema, open bite, crowding, gingival (or gummy) smile, little exposure of teeth. Six groups of images containing six images each were formed and consisted of two experimental images (digitally manipulated) and four control images. These images were provided to the participants, who evaluated them by means of a questionnaire and a visual analog scale. The Kruskal-Wallis, Mann-Whitney, chi-square, and Fisher exact tests were used for data analysis.

Results: All malocclusions had a negative impact on acceptance by the evaluators for the purposes of affective/romantic relationships, with crowding being the type of malocclusion that led to the highest level of rejection ($P < .01$).

Conclusion: Malocclusions have a negative influence on the development of affective/romantic relationships among young adults. Individuals with good occlusion are seen in a more positive light, from the perspective of affective life. (*Angle Orthod.* 2016;86:638–643.)

KEY WORDS: Influence smile; Dental esthetics; Relationship

INTRODUCTION

In the literature, a strong relationship between physical appearance and social attractiveness has been documented.¹ According to Dion et al.,² “What is beautiful is good.” Garcia et al.³ noted that people are

especially inclined to start conversations with physically attractive people.

For young adults, physical attractiveness is an important factor that affects social relationships,⁴ and a person's physical appearance, together with his or her sexual identity, are the personal characteristics most obvious and accessible to others during social interaction.² Nevertheless, facial appearance plays a significant role in determining physical attractiveness in general.¹ The face is the part of the body considered most important with respect to attraction during interpersonal communication.^{5,6}

During interpersonal interaction, it is most common for individuals to focus on the other person's eyes and mouth and give less attention to other facial characteristics.⁷ The teeth are considered the most important components in the facial architecture,⁸ and a harmonious smile plays an important role in establishing physical and facial beauty.⁹

Attractiveness causes positive emotional reactions in the observer, creating desires to establish affective/romantic relationships.¹⁰ Studies have demonstrated

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that young adults with healthy smiles are considered more attractive, perceived as being more intelligent, and regarded as those with the best social skills.¹ However, past research has not shown a possible influence of malocclusion in young adults on the development of affective/romantic relationships, such as when flirting. Based on this premise, the aim of the present study was to evaluate the extent to which different types of malocclusion may affect the development of affective/romantic relationships between young adults of both sexes, in addition to verifying the hypothesis that malocclusion interferes negatively in romantic attraction among young adults.

MATERIALS AND METHODS

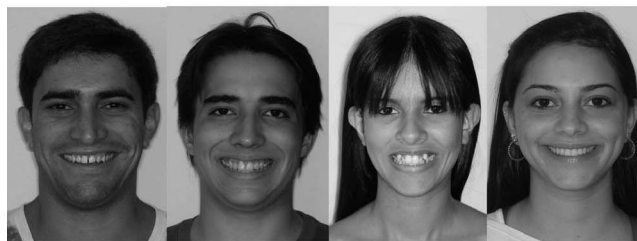
This was a cross-sectional study in which 2160 young adult men and women ranging in age from 18 years to 25 years were asked to evaluate the influence of malocclusion on the development of affective/romantic relationships. The sample of evaluators was randomly selected.

Before data collection began, the project was sent for approval by the Research Ethics Committee of Southwest Bahia State University, and the project was approved (number 17333113.1.0000.0055). Before the survey began, participants in the survey groups answering the questionnaires and those participants whose images were used in the questionnaires signed the term of free and informed consent with respect to the portion of the study in which they would participate. Those who ceded their images for use in the study knew and agreed to the modifications of their smiles.

Photographs of six young adults ranging in age from 18 years to 25 years were used and included three photographs of women and three photographs of men. The images of two individuals (one man and one woman) were manipulated to create malocclusions such as diastema, open bite, crowding, gingival (or gummy) smile, and little exposure of teeth. The alterations were made in an image manipulation software program (Photoshop, CS3, Adobe Systems, San Jose, Calif), and changes were made only in the teeth of the participants so that the face remained without alteration. A total of 12 images were obtained that were superimposed on the images of the smiles of a man and a woman with malocclusion (positive control) and the smile of a couple without malocclusion (negative control) (Figure 1).

The sample size calculation was performed using nQueryAdvisor (version 6.01, Solution Statistics, York, Ireland). Based on a 5% ($\alpha = .05$) significance level, the sample size was calculated to achieve the potential of 80%. The sample size calculation showed that 60 participants would be needed for each group of men and women.

a. Positive and Negative Controls



b. Experimental patient without malocclusion



c. Experimental patients with the malocclusions evaluated

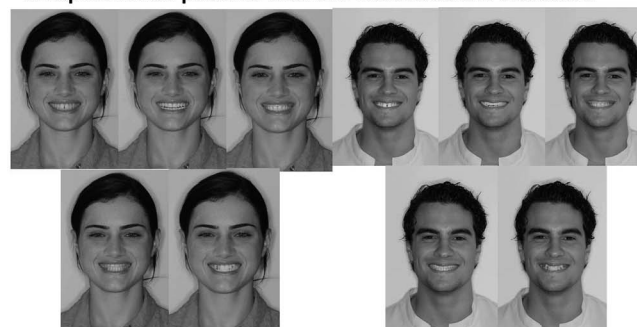


Figure 1. Images used in the study: (a) positive and negative controls, (b) participant without malocclusion, (c) participants with evaluated malocclusions.

The criteria for inclusion in the sample were young adult men and women ranging in age from 18 years to 25 years. Excluded from the sample were individuals who were married, visually impaired, or students of a higher education course in the area of health.

Once the images were obtained, they were distributed to six different survey groups, with each group presenting the four control images (negative and positive, masculine and feminine) and two images, one of a man and the other of a woman, with digitally altered malocclusions. It is worth pointing out that each digitally altered malocclusion appeared in only one survey group, with its inclusion in a certain survey group being completely random.

Before analysis of the images, the evaluators were asked questions with regard to sex, race, age, sexual orientation, and whether they ever planned to marry. After this, the images were presented and followed with five questions: (1) At a party, would a person with this type of smile attract you? (2) Would you start an

Table 1. Demographic Data of Study Participants

Variables	Survey					
	1 (n = 360)	2 (n = 360)	3 (n = 360)	4 (n = 360)	5 (n = 360)	6 (n = 360)
Age, mean \pm SD	22.1 \pm 2.0	21.4 \pm 2.5	21.5 \pm 2.8	22.1 \pm 2.3	21.0 \pm 2.8	21.0 \pm 2.4
Men, %	61.7	68.3	46.7	40.0	70.0	66.7
Women, %	38.3	31.7	53.3	60.0	30.0	33.3

intentional conversation with a person with this type of smile? (3) Would you flirt (at a party, for example) with a person with this type of smile? (4) Would you start a serious relationship with a person with this type of smile? (5) If yes, would you try to convince him/her to begin treatment to make his/her smile more harmonious? After answering these questions, the evaluators were invited to quantify the image of the smile using a visual analog scale, 0–100 mm. The scale had a sliding bar, digitally transferred along the scale, marking 0 for complete disagreement, 50 for neutral, and 100 for complete agreement. The corresponding numeric value was saved in PowerPoint 2010 (Microsoft, Redmond, Wash) for later tabulation of the data.

Each image was accompanied by five questions, totaling 30 questions per survey. The participants were given 1 minute to visualize each image, respond to the questions, and complete the scale without the right to return to the previous image.

The photographs in the questionnaires were presented in high resolution on a 42-inch monitor placed at a distance of 50 cm from the evaluator. The images were presented in the original size, as a person would present himself or herself, facing each other in a casual courtship situation.

It is worth noting that the evaluators were not aware of the existence of other surveys with other malocclusions.

At the time of data tabulation, only responses directed to the opposite sex were considered. Answers given to same-sex individuals as well as responses by participants who self-identified as gay were discarded.

Statistical Analysis

The scores attributed to each image were evaluated by means of the Kruskal-Wallis test, and the comparison between pairs was made using the Mann-Whitney test. The frequencies of responses given by the participants of each group were compared by chi-square test, and in cases in which the expected frequency was lower than five ($n < 5$), the Exact Fisher test was used. The level of significance adopted was 5% ($\alpha = .05$).

RESULTS

Table 1 shows the demographic data of the study participants. In general, the mean age \pm standard

deviation of the evaluators was 21.5 ± 2.5 years, with the majority being men (58.9%).

The images of the two individuals (negative control male), 4 (positive control male), 5 (negative control female), and 6 (positive control female) were evaluated in a similar manner ($P > .001$).

In Tables 2 and 3, the responses of men and women, respectively, are presented with regard to interest in relationship according to the type of smile. Significant differences were observed in the frequencies of responses to all questions asked except those responses from women in relation to treatment. For both men and women, all malocclusions had a negative impact on the acceptance of the individuals for the purposes of relationships when compared with the harmonious smile, with crowding receiving the highest level of rejection. In the case of men, once a serious relationship was started, diastema, little exposure of teeth, and crowding were the malocclusions that would most motivate them to try to convince their companions to initiate treatment.

In Figure 2, attractiveness of the evaluators of the study is quantified with regard to the images presented. For men, the gingival smile was observed to be the only malocclusion that did not have a negative and significant impact on attractiveness of the individual's smile, with crowding being the condition that most reduced the attractiveness of the smile. For women, all malocclusions were noted to have negative and significant impacts on attractiveness of the individual's smile, with diastema and crowding being the conditions that most reduced the attractiveness of the smile.

DISCUSSION

In the contemporary world, esthetics is highly valued. It is no exaggeration to say that people are judged more by appearance than by personality.¹¹ When one speaks of body esthetics, the face is the most apparent and most judged component of the human body. According to a study by Palomares et al.,¹² the eyes are the components of the face that draw the most attention at a first encounter, followed by the smile. The teeth have a primordial function in the architecture of the smile, and their good positioning is a precept for an attractive smile.^{13,14} Therefore, good positioning of the teeth when smiling has an influence on social relationships. Starting from this presupposition, the question arises with

Table 2. Responses of Men With Regard to Interest in a Relationship, According to the Type of Smile

Response	Images Evaluated						P Value
	Ideal	Diastema	Gingival/Gummy Smile	LTE ^a	Crowding	Open Bite	
Attraction							
Yes, %	71.4	29.7	39.0	29.2	9.5	32.5	<.001 ^b
No, %	28.6	70.3	61.0	70.8	90.5	67.5	
Intentional conversation?							
Yes, %	67.9	45.9	51.2	25.0	19.0	40.0	.001 ^b
No, %	32.1	54.1	48.8	75.0	81.0	60.0	
Would flirt?							
Yes, %	78.6	48.6	63.4	50.0	16.7	47.5	<.001 ^b
No, %	21.4	51.4	36.6	50.0	83.3	52.5	
Serious relationship							
Yes, %	60.7	32.4	43.9	37.5	14.3	27.5	.002 ^b
No, %	39.3	67.6	56.1	62.5	85.7	72.5	
Treatment ^c							
Yes, %	41.2	83.3	36.8	77.8	83.3	45.5	.036 ^d
No, %	58.8	16.7	63.2	22.2	16.7	54.5	

^a LTE indicates little tooth exposure.^b Chi-square test.^c Responses only from individuals who answered "yes" to the question about a serious relationship.^d Exact Fisher test.

respect to the influence of malocclusion on romantic relationships among young adult men and women.

In 1985, Shaw¹³ developed a study in which he implanted dental characteristics such as normal incisors, prominent incisors, absence of a lateral incisor, severely crowded incisors, and unilateral cleft (leporine) lip in photographs of children and presented the images to be evaluated together with an analog scale. He proved that children with a satisfactory dental appearance were judged to be more beautiful, desirable as friends, more intelligent, and less likely to behave in an aggressive manner than children who

displayed dentofacial anomalies. Since that time, it has been thought that teeth may have an influence on the social relations of individuals.

To conduct this study, the methodology used was that described by Pithon et al.¹¹ when they evaluated the influence of malocclusion on those who were seeking employment. The change made in the present study was related to the quantity of surveys applied, in which six different surveys were applied because different malocclusions were evaluated, whereas in the Pithon et al.¹¹ study, only two surveys were applied, one including teeth with different malocclusions and the

Table 3. Responses of Women With Regard to Interest in a Relationship, According to the Type of Smile

Response	Images Evaluated						P Value
	Ideal	Diastema	Gingival/Gummy Smile	LTE ^a	Crowding	Open Bite	
Attraction							
Yes, %	94.4	25.0	47.2	75.0	4.3	15.8	<.001 ^b
No, %	5.6	75.0	52.8	25.0	95.7	84.2	
Intentional conversation?							
Yes, %	88.9	28.1	55.6	75.0	13.0	31.6	<.001 ^b
No, %	11.1	71.9	44.4	25.0	87.0	68.4	
Would flirt?							
Yes, %	88.9	25.0	52.8	70.0	8.7	21.1	<.001 ^b
No, %	11.1	75.0	47.2	30.0	91.3	78.9	
Serious relationship							
Yes, %	83.3	28.1	55.6	70.0	13.0	31.6	<.001 ^b
No, %	16.7	71.9	44.4	30.0	87.0	68.4	
Treatment ^c							
Yes, %	53.3	88.9	73.7	50.0	100.0	50.0	.211 ^d
No, %	46.7	11.1	26.3	50.0	0.0	50.0	

^a LTE indicates little tooth exposure.^b Chi-square test.^c Responses only from individuals who answered "yes" to the question about a serious relationship.^d Exact Fisher test.

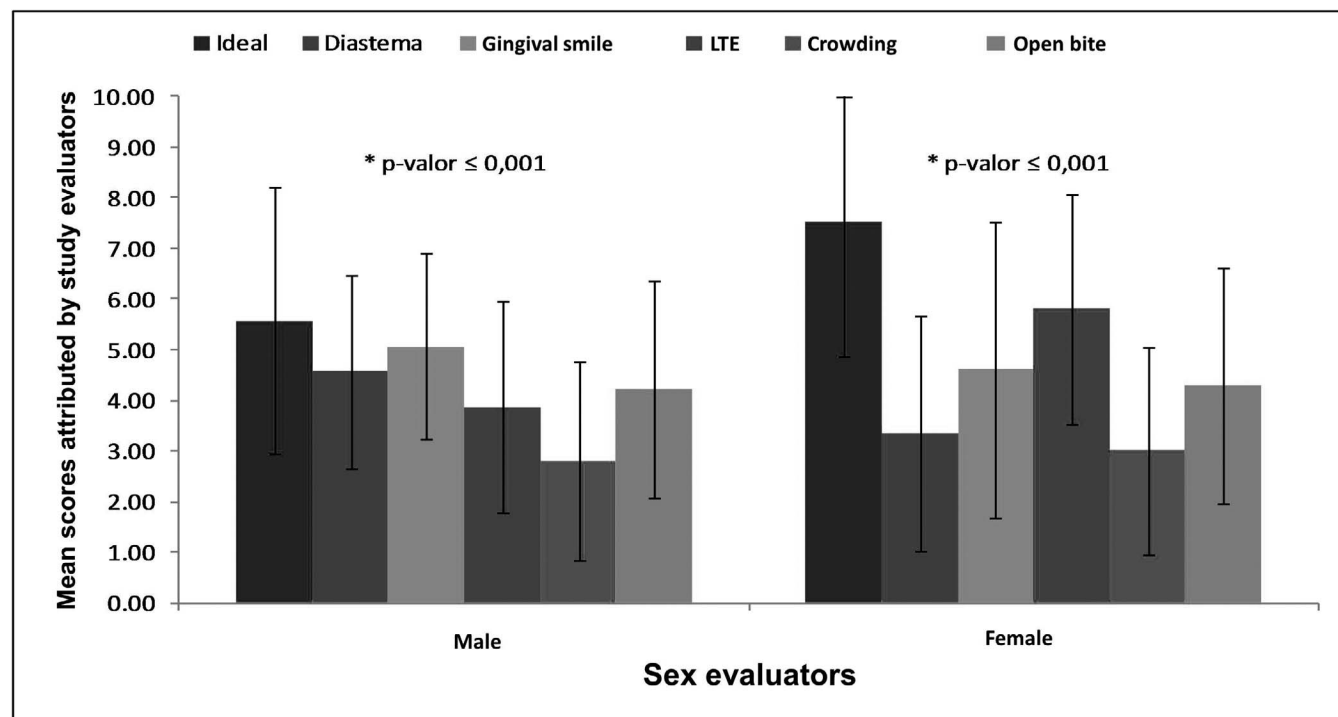


Figure 2. Mean scores attributed by study evaluators according to evaluators' sex and type of occlusion shown in the images. The columns represent mean scores, error bars, and standard deviations.

other including teeth without malocclusion. The authors did not evaluate the impact of each malocclusion separately, as was done in the present study, in which the impact of malocclusions such as diastema, gingival smile, crowding, little exposure of teeth, and open bite on romantic relationships was verified. These malocclusions were chosen because they can be perceived in a front view while smiling.

Another modification in the methodology concerns the questions applied together with the images. In this case, the questions were directed toward issues of attraction, intentions when dating, flirting, and starting a more serious relationship in addition to the issue of whether, once a relationship with an individual with malocclusion had been started, the evaluator would try to convince the individual to begin treatment to make the smile more harmonious.

Because six different surveys were applied, each being evaluated by different evaluators, it was necessary to have control groups that would have images of men and women, with and without malocclusion. When the statistical tests were applied, the control groups were evaluated in a similar manner among the six surveys. This result is important because it shows the reliability of the obtained responses.

With regard to malocclusions, the result was that all impacted negatively on the evaluators. This result corroborates that of other studies available in the literature with regard to the evaluation of the impact of

malocclusion on other requisites.¹⁵⁻¹⁸ For specific types of malocclusions, crowding was the type most frequently rejected among the evaluators. This result may be justified by the fact that crowding is the most prevalent malocclusion and, therefore, the one most associated with malocclusion by laypersons.¹⁹

When the men were asked which of the malocclusions would motivate them to try and convince their companions to initiate treatment, they listed diastema and little tooth exposure. The gingival smile had no impact. These results may be explained by the fact that the gingival smile gives women a younger looking appearance, and this is a preference of the majority of men.²⁰

Pithon et al.²¹ conducted a study in which perceptions of different proportions of the gingival smile were evaluated, and it was verified that the image in which there was no gingival exposure was the one classified as the least attractive. The authors related the low scores to the fact that the presence of a line below the smile, in women, indicates characteristics of aging. The same explanation may be attributed to the result of the present study, in which there was acceptance by the men of the gingival smile in women, losing favor only to the ideal smile.

On the other hand, there was greater acceptance by women of images of men showing the characteristic of little exposure of teeth, falling behind only to images of the ideal smile. Starting from the same presupposition

as the previous one, this characteristic attributes the characteristic of an older appearance to an individual, thus allowing one to believe that women tend to be more attracted to older men.²²

In this study, it could be verified that, in some way, all malocclusions had negative impacts on the attractiveness of individuals, with some having more impact than others.

CONCLUSIONS

- The presence of malocclusion interferes negatively in the development of affective/romantic relations among young adults.
- Crowding was the malocclusion that most negatively interfered in the development of affective/romantic relations between men and women.
- Ranked after the ideal smile, the smiles most accepted by men and women were those that presented with gingival exposure and little tooth exposure, respectively.

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