Perception of social and emotional characteristics through smile

Percepção de características sociais e emocionais através do sorriso

Percepción de características sociales y emocionales a través de la sonrisa

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Abstract
Introduction: The concept of beauty, however a subjective issue, is overvalued in some societies, especially in Brazil. Beautiful people enjoy social advantages and are best evaluated for having positive characteristics. Objective: To quantify, by means of a questionnaire, the ability of interviewees, to evaluate / intuit / attribute specific characteristics to unknown people, starting from an observational point of view by means of different photos. Methods: Six different photos were designed for undergraduate students, each representing a smile with different aesthetic changes. Participants answered a questionnaire that contained 10 statements regarding emotional and social characteristics and, afterwards, scoring whether or not they agreed with each statement for each evaluated image. Results: A better evaluation was obtained of image considered having harmonic smile, while greater negative characteristics were attributed to smiles with aesthetic changes, such as fractures, diastema, unsatisfactory restorations, and color changes. Conclusion: According to this study, it can be concluded that dental aesthetics influence the evaluation and judgment of certain characteristics influencing on the emotional and social background. It is the duty of the dental surgeon to be attentive to this subjective step when facing unaestethic smiles, allowing a greater understanding the psycho-social context of the patient.
Keywords: Esthetics, Dental; Self concept; Interviews, group.

Resumo
Introdução: O conceito de beleza, embora seja uma questão subjetiva, é supervalorizado em algumas sociedades, principalmente no Brasil. Pessoas bonitas desfrutam de vantagens sociais e são mais bem avaliadas por terem características positivas. Objetivo: Quantificar, por meio de um questionário, a capacidade dos entrevistados de avaliar / intuir / atribuir características específicas a pessoas desconhecidas, a partir de um ponto de vista observacional por meio de diferentes fotos. Métodos: Foram elaboradas seis fotos diferentes para alunos de graduação, cada uma representando um sorriso com diferentes alterações estéticas. Os participantes responderam a um questionário que continha 10 afirmações sobre características emocionais e sociais e, posteriormente, pontuando se concordavam ou não com cada afirmação para cada imagem avaliada. Resultados: Obteve-se melhor avaliação da imagem considerada com sorriso harmônico, enquanto maiores características negativas foram atribuídas aos sorrisos com alterações estéticas, como fraturas, diastemas, restaurações insatisfatórias e alterações de cor. Conclusão: De acordo com este estudo, pode-se concluir que a estética dental influencia na avaliação e julgamento de determinadas características influenciando no contexto emocional e social. É dever do cirurgião-dentista estar atento a esse passo subjetivo ao se deparar com sorrisos inestéticos, permitindo uma maior compreensão do contexto psicossocial do paciente.
Palavras-chave: Estética dentária; Autoimagem; Entrevistas em grupo.

Resumen
Introducción: El concepto de belleza, aunque sea una cuestión subjetiva, está sobrevalorado en algunas sociedades, especialmente en Brasil. Las personas hermosas disfrutan de ventajas sociales y son mejor evaluadas por tener características positivas. Objetivo: Cuantificar, mediante un cuestionario, la capacidad de los entrevistados, para

evaluar/intuir/atribuir características específicas a personas desconocidas, partiendo de un punto de vista observacional mediante diferentes fotografías. Métodos: Se diseñaron seis fotografías diferentes para estudiantes de pregrado, cada una representando una sonrisa con diferentes cambios estéticos. Los participantes respondieron un cuestionario que contenía 10 afirmaciones sobre características emocionales y sociales y, posteriormente, puntuaron si estaban o no de acuerdo con cada afirmación para cada imagen evaluada. Resultados: Se obtuvo una mejor evaluación de la imagen considerada con sonrisa armónica, mientras que se atribuyeron mayores características negativas a las sonrisas con cambios estéticos, como fracturas, diastemas, restauraciones insatisfactorias y cambios de color. Conclusión: De acuerdo con este estudio, se puede concluir que la estética dental influye en la evaluación y juicio de ciertas características que influyen en el trasfondo emocional y social. Es deber del cirujano dentista estar atento a este paso subjetivo frente a sonrisas antiestéticas, permitiendo una mayor comprensión del contexto psicosocial del paciente.

Palabras clave: Estética dental; Autoimagen; Entrevistas grupales.

1. Introduction

Physical appearance and facial features are considered fundamental aspects of the first impression when meeting someone. Still, they participate in the construction of the personality image, as they present themselves as the first form of identification and non-verbal communication, which can directly interfere in interpersonal relationships, as well as influence an individual's self-esteem (Althagafi, 2021; Dong et al., 1999; Meazzini et al., 2020).

Specifically to facial aspects, the smile is the portion responsible for the greatest attraction, with the dental elements representing the harmony of this region (Dong et al., 1999; Saltovic et al., 2018; van Cruchten et al., 2022). A smile called "pleasant" can produce an aura that expands the beauty of the face, being part of the qualities and virtues of the individual's personality. On the other hand, their commitment can lead people to resort to subtle or explicit means of hiding their mouths, which affects aspects of lifestyle, interfering with their self-esteem and with a direct impact on quality of life (Akram AJ et al., 2013).

White and well-aligned teeth are believed to be associated with health, youthfulness, dynamism, success, friendliness, expressiveness, and socioeconomic prestige (Aldeeri et al., 2020; Alhammadi MS et al., 2018). This aspect, encouraged by the aesthetic standards imposed by society, is one of the main desires of most patients who attend dental offices (Saffarpour A et al. 2016).

Therefore, the objective of the present study was to evaluate the perception of emotional and social characteristics in young people and adults, facing different smiles.

2. Methodology

Ethical Considerations

This study was approved by the Research Ethics Committee at Federal University of Maranhão, São Luís, Brazil (#2.982.539/2018) in accordance with the Declaration of Helsinki. There was no conflict of interest to disclose.

Study Design and Sampling

This was a descriptive critical study conducted at a private college of Dentistry São Luís, Brazil over the period between August and September 2018. The study has invited all the students who attended 1st year level which are exposed only to basic sciences of health area, with no previous knowledge regarding clinical features. Hence, they were not aware of the basic concepts of smile aesthetics.

Questionnaire

The methodology used was inductive-deductive through the application of the questionnaire that presented emotional and social questions (Saltovic et al., 2018). A self-administered questionnaire was distributed to all participants in the classroom

prior to their scheduled lectures. The questionnaire was anonymous, and participation was voluntary. The questionnaire contained information regarding the study objectives, approval of the study by ethical committee, information of the researchers and instructions to fulfill the research. There were two sections to be filled: 1st section contained questions regarding age and sex and in the 2nd section contained the validated questionnaire containing 10 questions - the first 5 referring to emotional characteristics and the other 5 to the characteristics of social interaction. For each question, the participant should assign a response following the Likert Scale varying from 0 (zero) (totally disagree) to 5 (five) (totally agree) according to the degree of their opinion. To answer all questions, the participants were asked to analyze six different smile photographs identified with a letter of the alphabet (from A to F) representing different aesthetic variations (*e.g.* maxillary midline diastema, darkened tooth, fractured tooth #11, multiple restorations and healthy teeth) without any kind of manipulation (Figure 1). Each photo was projected in the classroom, one at a time, with a 1' interval between them. Still, all images were chosen from records of the principal investigator's personal file.

Figure 1 - Projected smiles representing different aesthetic variations. A: Healthy teeth. B: Darkened tooth. C: Tooth 11 discolored with unsatisfactory restoration. D: Maxillary midline diastema. E: Fractured tooth #11. F: Multiple unsatisfactory restorations.

Source: Authors.

Statistical analysis

For data analysis, descriptive statistics were used to characterize the sample (age and sex). In addition, each question was analyzed separately according to the criteria assigned to each photo. Each criteria was then analyzed according to age and sex (independent variable) aiming to verify the association of answers regarding the 6 photos (dependent variable) by inferential statistics using the Chi-square test at a significance level of 5%. The analyzes were performed using the SPSS program, version 23 (IBM, USA).

3. Results

A total of 76 students were enrolled in this study. The mean age was 20 ± 1.84. To analyze the answers to all photos, they were grouped into two options: positive responses (+) (I AGREE IN PART / TOTALLY AGREE) and negative responses (-) (I DISAGREE IN PART / TOTALLY DISAGREE) according to the Likert Scale used previously. Neutral responses (I DO NOT AGREE AND I DO NOT DISORDER / I WILL NOT RESPOND) were not used for this analysis. Overall, Photo A

received the most positive judgement to both backgrounds investigated (91.6% and 88.6% to emotional and social counterparts, respectively). On the other hand, Photo B received the most negative judgement regarding emotional background *(This person fells itself unsafe – 85.7%)* whereas to social background, 49 participants (86%) considered Photo F with the most negative judgement (*This person is ashamed of showing a smile).* (Table1).

Table 1 - Distribution of positive (+ N) and negative (-N) answers regarding emotional and social life backgrounds of students.

		+ N(/%)	- N(%)	+N(/%)	- N(/%)	+N(%)	- N(/%)	+ N(/%)	- N(/%)	+ N(/%)	- N(/%)	+ N(/%)	- N(/%)
EMOTIONAL BACKGROUND	*This person is happy*	63 (91.3)	6 (8.7)	25(53.2)	22(46.8)	39(76.5)	12(23.5)	41(74.5)	14(25.5)	23(46)	27(54)	23(52.3)	21(47.7)
	This person fells itself unsafe	14(24.1%)	44(75.9)	54(85.7)	9(14.3)	32(66.7)	16(33.3)	23(50)	23(50)	49(80.3)	12(19.7)	39(70.9)	16(29.1)
	This person feels itself good	52(85.2)	9(14.8)	15(27.3)	40(72.7)	30(65.2)	16(34.8)	34(70.8)	14(29.2)	23(39)	36(61)	20(45.5)	24(54.5)
	This person is sad	7(13.7)	44(86.3)	19(42.2)	26(57.8)	14(38.9)	22(61.1)	10(25.6)	28(71.8)	22(50)	22(50)	23(47.9)	25(52.1)
	This person feels itself beautiful	55(90.2)	6(9.8)	8(17)	39(83)	18(48.6)	19(51.4)	25(61)	16(39)	22(50)	22(50)	19(34.5)	36(65.5)
SOCIAL LIFE BACKGROUND	*This person is solely*	5(14.7)	29(85.3)	11(36.7)	19(63.3)	10(27.8)	26(72.2)	7(24.1)	22(75.9)	9(31)	20(69)	15(51.7)	14(48.3)
	This person is bullying victim	6(14.6)	35(85.4)	48(85.7)	8(14.3)	31(70.5)	13(29.5)	30(66.7)	15(33.3)	41(80.4)	10(19.6)	35(76.1)	11(23.9)
	This person is ashamed of showing a smile	8(11.4)	62(88.6)	59(88.1)	8(11.9)	39(73.6)	14(26.4)	41(73.2)	15(26.8)	53(81.5)	12(18.5)	49(86)	8(14)
	This person is funny	26(72.2)	10(27.8)	9(50)	9(50)	17(65.4)	9(34.6)	13(46.4)	15(53.6)	12(57.1)	9(42.9)	10(38.5)	16(61.5)
	This person has no many friends	6(21.4)	22(78.6)	5(18.5)	22(81.5)	6(31.6)	13(68.4)	6(28.6)	15(71.4)	6(27.3)	16(72.7)	12(38.7)	19(61.3)

Source: Authors.

The Table 2 illustrates the association between independent variables (age and sex) and the studied outcome (answers of 6 photos). Women in Photo D tend to have more negative judgment (p = 0.03) than their counterparts independent of age.

Table 2 - Comparison of age (under and above 20 years) and sex (male and female) regarding positive (+N), negative (-N) and neutral (-+N) answers to all photos. *Pearson x2 test. ** statistical significance (≤ 0.05).

		Age			Sex		
		≤ 20 years	> 20 years	p*	Male	Female	p*
Photo A	- N (%)	21 (45,7)	12 (40,0)	0,12	13 (35,1)	20 (51,3)	0,34
	+N(%)	12 (26,1)	14 (46,7)		14 (37,8)	12 (30,8)	
	-+ N (%)	13 (28,3)	4 (13,3)		10 (27,0)	7 (17,9)	
Photo B	- N (%)	12 (26,1)	11 (36,7)	0,19	10 (27,0)	13 (33,3)	0,16
	+N(%)	27 (58,7)	17 (56,7)		20 (54,1)	24 (61,5)	
	-+ N (%)	7 (15,2)	2 (6,7)		7 (18,9)	2 (5,1)	
Photo C	- N (%)	12 (26,1)	6 (20,0)	0,51	9 (24,3)	9 (23,1)	0,75
	+N(%)	24 (52,2)	14 (46,7)		17 (45,9)	21 (53,8)	
	-+ N (%)	10 (21,7)	10 (33,3)		11 (29,7)	9 (23,1)	
Photo D	- N (%)	15 (32,6)	7 (23,3)	0,63	6 (16,2)	16 (41)	0,03**
	+N(%)	20 (43,5)	16 (53,3)		19 (51,4)	17 (43,6)	
	-+ N (%)	11 (23,9)	7 (23,3)		12 (32,4)	6 (15,4)	
Photo E	- N (%)	10 (21,7)	9 (30,0)	0,68	6 (16,2)	13 (33,3)	0,12
	+N(%)	26 (56,5)	16 (53,3)		21 (56,8)	21 (53,8)	
	-+ N (%)	10 (21,7)	5 (16,7)		10 (27,0)	5 (12,8)	
Photo F	- N (%)	12 (26,1)	5 (16,7)	0,27	10 (27,0)	7 (17,9)	0,28
	+N(%)	22 (47,8)	20 (66,7)		17 (45,9)	25 (64,1)	
	-+ N (%)	12 (26,1)	5 (16,7)		10 (27,0)	7 (17,9)	

Source: Authors.

4. Discussion

This research focused on evaluate the capacity of the students to intuit and to attribute specific characteristics (social and emotional) to unknown people by their smiles. As this purpose, others have the same focus (Eli I, Bar-Tal Y, 2001). conducted a study whose objective was to realize the importance of dental appearance in a first impression. They found that the effect of the appearance of teeth on the stereotype of physical attractiveness is more evident when men evaluate women and vice versa, than when they evaluate their own sex. While Isiekwe's study (Isiekwe & Aikins, 2019) also applied a questionnaire to young adults, but with the aim of evaluating which characteristics were most important in their smile according to their self-perception.

Van der Geld et al. (Van der Geld et al., 2007) (2007) carried out a study on the self-perception of the attractiveness of the smile and its influence on some personality traits. And Althagafi (Althagafi, 2021) (2021) assessed the perception of smile characteristics among students at different levels of learning. At each study level, female dental students apparently had greater perceptions of smile esthetics than male dental students.

This study found that there was not statistically significant difference (p> 0.05) in aesthetic emotional perceptions in relation to smiles and images of altered smiles with non-aesthetic teeth. Results similar to the studies of Althagafi (Althagafi, 2021) e Saffarpour (Saffarpour et al., 2016) (2016).

Dentist-patient communication is the fundamental element to guarantee an efficient and functional aesthetic result. Understanding the patient and his needs, as well as helping him to understand them, is the first step in order to offer appropriate and individualized aesthetic treatments (Aldeeri et al., 2020; Silva et al., 2020).

The questionnaire consisted of 10 statements, divided into two specific groups of characteristics: the first 5 statements referred to emotional characteristics and the last 5 statements, referred to social characteristics. Smile A, which represented a smile within the aesthetic standards accepted by most of the current society (white and aligned teeth, without caries lesions, fractures or diastemas), was successful in all the positive statements to which it was submitted, both statements related to emotional and social characteristics. The individual who owned smile A was considered happy, a person who feels good about himself and who feels beautiful. With very low numbers for unfavorable statements that referred to feelings such as insecurity and sadness.

In the study by Henson et al.(Henson et al., 2011) (2011), verified the same results in this investigation, all the social skills assessed were equally better appreciated in individuals with an ideal smile, without exception. And Cotrim (Cotrim et al., 2015) et al 2015, that even with different, differentiated goals that people prefer big teeth and without altered alterations as well.

Ideal smiles characterize people with advantages, such as vigor and joviality, regardless of the age of the owner of the smile, in addition to providing acceptance and success in their social group. These statements agree with the results of this study, as the responses were unfavorable with agreement among the interviewees about the photo that shows color changes and unsatisfactory restoration quite evident in element (Eli et al., 2001). Likewise, the photos that received high marks concordance indexes in relation to unfavorable statements, demonstrating the discontent of the interviewees with fracture, size and dental shape, changes shown in the images cited.

Aesthetic changes in the smile can sometimes cause loss of self-confidence and self-esteem, leading the individual to behave in a shy, reserved, and withdrawn manner. In 2007 Geld et al(Van der Geld et al., 2007), conducted a study with 122 individuals who judged their smile attractive and compared it with characteristic personality traits. In the study it was concluded that the size, the visibility of the teeth, the position of the upper lip and the color of the teeth are critical factors for the attractiveness of the smile in the face of the social dimension of perception, that is, the perception of others regarding the smile. Smiles that show significant changes in the central incisors, which may have contributed to the greater acceptance of unfavorable statements.

The anterior teeth and especially the central incisors are the ones that attract the most attention in the smile, this is because these elements are the ones that receive the lightest and thus have a special emphasis on phonation, smile, and laughter. However, broken, poorly positioned, stained or dark teeth tend to attract more attention than central incisors (Pontons-Melo et al., 2021).

In Romsics's (Romsics et al., 2020)'s study, The aim was to assess if students' dentofacial esthetic autoperception and heteroperception are associated with their actual stage of studies (grade) and if autoperception has any effect on heteroperception. This study, on the other hand, sought only heteroperception, since the public interviewed was the same

Regarding gender, there were no significant differences in the evaluation of the statements for each smile, corroborating the findings of Tufekci et al.(Tufekci et al., 2008)(2008) in which no significant difference was found between the female and male genders in terms of awareness and self-perception about the appearance of their teeth and their profile, opposing Flores-Mir et al. (Flores-Mir et al., 2005) (2005), in which women are more critical about their dental appearance when compared to their male counterparts. In a study in Israel, the male gender was the gender that had the highest dissatisfaction, however the research was carried out in a military clinic and the sample consisted mostly of men (Tin-Oo et al., 2011).

Therefore, the hypothesis that people attribute certain characteristics to unknown people is confirmed, based only on the evaluation of the smiles of unknown individuals. What among other changes, can cause psychological damage to the patient and that is why it is so necessary for the dentist to know how to work and act in such situations. Patients with very high dissatisfaction with their smile tend to manifest a series of defensive expressions, such as covering their mouths with their hands,

affecting aspects directly related to the lifestyle that the individual adopts. For better results and patient satisfaction, it is necessary for the dentist to perform in a complete and complex way, evaluating each individual characteristic that is present. The results will be important, since they will enable new forms of approach and individualized planning, taking the professional-patient relationship to a more personal dimension, in which the DC will be able to better understand the feelings that govern this patient who seeks him not only in search of a service, but self-acceptance.

This study presented results like those found in the literature, even though it was carried out with undergraduate students in Dentistry. These students were in the first year of the course, and possibly, they may have been biased in their responses. The choice of this sample was due to the fact that these students had only taken subjects in the basic cycle and had not yet had any type of contact with more specific concepts related to dental aesthetics.

5. Conclusion

According to the results obtained, it can be concluded that aesthetics interferes in the evaluation and elaboration of opinions about individuals. A harmonious smile is characteristic of happy people, who feel good about their appearance and who are not ashamed to smile. These people are less prone to bad feelings, such as insecurity and sadness, and to embarrassing situations such as bullying. Meanwhile, people with non-harmonious smiles end up subject to bad evaluations, being considered more sad, insecure, and prone to situations of shame and fear. Such findings are important since, as health professionals, dentists can have a direct influence on the modification of conditions such as these. It is a fundamental role of the dentist, in addition to mastering the technique, to be able to understand the range of concepts, opinions and impressions that shape each patient individually.

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