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## \*Corresponding author

Maria do Rosario Dias, Affiliation:  
Associate Professor, Egas Moniz  
School of Health and Science, Campus  
Universitario, Monte de Caparica, 2829-  
511, Almada, Portugal

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Research Article

# Is the Orthodontic Smile Considered as Aesthetic in Adult Patients?

Gabriela Mello, José Grillo Evangelista, Valter Pedroso Alves, Ana Sintra Delgado  
and Maria do Rosário Dias\*

Associate Professor, Egas Moniz School of Health and Science, Campus Universitario, Monte de Caparica,  
2829-511, Almada, Portugal

## Abstract

In the last five years, pioneer studies were carried out in the Egas Moniz University Clinic surrounding the mental representation of the smile, centred on adolescent patients wearing orthodontic appliances, emerging with the results obtained as a new form of categorizing the perfect smile: The Orthodontic Smile. The present study is qualitative and exploratory and aims to understand the importance of the self-perception (mental representation) of the smile, now with the help of a new age range - Adult Patients. The sample consists of 100 subjects in the adult phase (25–59 y), namely patients wearing orthodontic appliances who were asked to draw two percepts about the self-perception of their own smile in two distinct moments: the first drawing, corresponding to before the wear of the orthodontic appliance (M1), and the second one, corresponding to drawing their smile after undergoing the orthodontic treatment (M2). The content analysis of the 200 drawings obtained was realized through a grid of content analysis, constituted by categories and subcategories. The patients also filled out a sociodemographic questionnaire, in which they responded to four open-ended questions in relation to the mental representation of the smile. Regarding the content analysis of the narrative, we highlight the fact that a Nice Smile seems to be mostly described as a Natural Smile and Aligned, being a motive for the seeking of dental treatment, primarily aesthetic issues, followed by functional considerations. When comparing the drawings before (M1) and after (M2) the wear of orthodontic appliances, the Category Broad Smile, is set up as the smile chosen as the most aesthetic. It seems that aesthetic motives represent the motivational power for the patient in the adult phase, when they decide to look for Orthodontic treatment.

## Introduction

Understanding the importance of smiling in terms of the intrapsychic perception (mental representation) of the individual's self-image, in the context of established interpersonal relationships, is a highly scientific topic [1-3]. The face is the area of the human body where emotions seem to be externalized, consciously or unconsciously, through facial expressions. In a clinical context, the practice of the art of smiling consists of the dentist's ability to recognize the aesthetic contours of each patient's face, in order to value therapeutic strategies and procedures intrinsic to each subject, in accordance with current aesthetic concepts [4]. In this sense, several authors have contributed to the categorization of various empirical smile typologies. According to Freitas - Magalhães, [5] smiling is considered a basic cognitive-affective skill, from the moment of birth until the end of life. Along these lines, Freitas Magalhães (2009) defined four types of smiles: (i) the Wide Smile, (ii) the Neutral Smile, (iii) the Upper Smile, and (iv) the Closed Smile. From this empirical perspective, the upper smile and the closed smile, show greater expressiveness in interpersonal relationships [2-5].

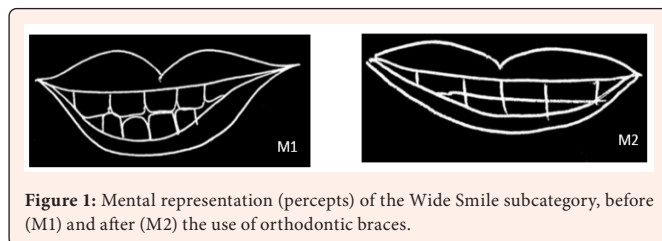
On the other hand, the Neutral Smile is not considered by many authors to be a smile of affective expression. While the Wide Smile shows the dental arch of both, the upper and lower jaws, the Neutral Smile does not seem to be associated with any specific facial expression. In addition, Sarver (2001) classified the Smile Arc as a type of smile defined by the "relationship of the curvature of the incisal edges of the incisors and upper canine with the curvature of the lower lip of the smile", which seems to be equivalent to the Upper Smile in Freitas-Magalhães (2009). The ideal Smile Arch "has the curvature of the maxillary incisal edge parallel to the curvature of the lower lip!" [6]. On the other hand, Sabri (2006) argues that the ideal smile seems to be characterized by a balance between eight components that should not be considered limiting factors but as artistic guidelines to help orthodontists in the therapeutic strategies adopted with patients [7]. In the last five years, pioneering studies have been carried out at the Egas Moniz University Clinic, Monte de Caparica, Portugal, based on the mental representation of the mouth and smile in adolescent patients wearing fixed orthodontic braces. In these studies, the Smile Category and four of its Subcategories were studied: The Wide Smile, the Upper Smile, the Neutral Smile and the Closed Smile. These studies looked at the Smile Category and four of its Subcategories: The Wide Smile, the Upper Smile, the Neutral Smile and the Closed Smile. In this line of thought, according to the results obtained, it was concluded that a new way of characterizing the Perfect Smile for the adolescent population - the Orthodontic Smile - seems to be emerging from the mental representation of the Smile (drawn percepts) [1-3]. The present study is qualitative and exploratory, aims to understand the importance of the self-perception (mental representation), of the oral cavity and the smile, now with the help of a new age range - Adult Patients.

## Materials and Methods

The sample for this study consisted of 100 subjects in the adult stage (25-59 years) (WHO, 2018), namely subjects wearing orthodontic braces, between 6M and 2 years of the therapeutic project, who were asked to draw two pictures of their perception of their smile at two different times: the first drawing refers to the moment before wearing the orthodontic appliance (M1), and in the second drawing, the patient was asked to draw their smile after wearing the orthodontic appliance (M2). The content analysis of the 200 pictorial percepts collected was carried out using a pictorial content analysis grid made up of categories and subcategories. The patients also completed a sociodemographic questionnaire in which they answered four open-ended questions related to the mental representation of their smile: i) What do you think a beautiful smile is? ii) Would you change anything about your smile? iii) What do you currently think of your orthodontic smile? iv) Why did you decide to seek dental care? A content analysis was also carried out on the subjects' open-ended answers, using a content analysis grid for the narrative of the answers given, especially created for this study.

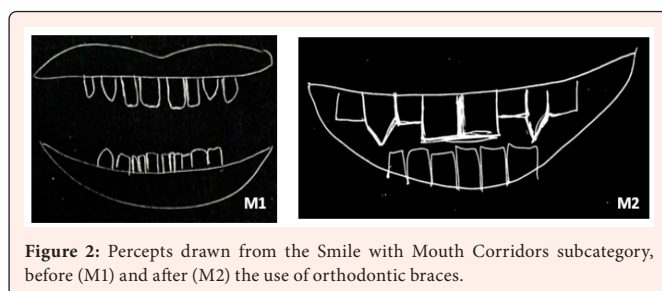
## Results and Discussion

In order to understand the repercussions of wearing orthodontic braces on the mental representation of the smile, adult patients were asked to draw their mouth/smile before (M1) and after (M2) wearing orthodontic braces. With regard to the analysis of the data obtained and based on the study of the pictorial content analysis grid, we particularly highlight the Smile category and the subcategories: (i) Closed Smile, (ii) Canine to Canine Smile, (iii) Wide Smile, (iv) Gingival Smile, (v) Smile with Mouth Corridors, and (vi) Upper Smile, as the empirical analysis slice of this article. According to the results obtained, we note the fact that only one percept was drawn corresponding to the Canine to Canine Smile [8], and no percept drawn was associated with the Closed Smile subcategory. Regarding the Wide Smile subcategory (Figure 1), we observed that 87 individuals (87%) drew wide smiles in M1 and 93 individuals (93%) drew wide smiles in M2. The Wide Smile seems to be defined by some authors by the elevation of the labial commissures and the display of the dental rows [5].



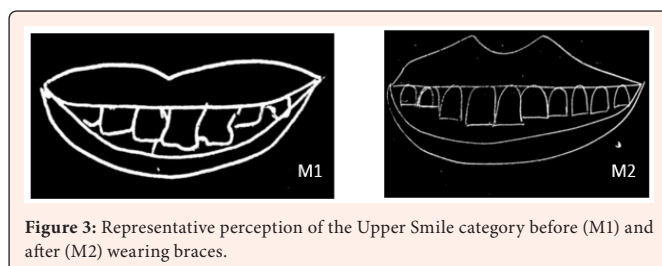
**Figure 1:** Mental representation (percepts) of the Wide Smile subcategory, before (M1) and after (M2) the use of orthodontic braces.

We also observed that, in relation to the subcategory Smile with Mouth corridors subcategory [9] (Figure 2), only 2 individuals (4%) drew this type of smile in M1 and only 1 individual (2%) drew this type of percept in M2.



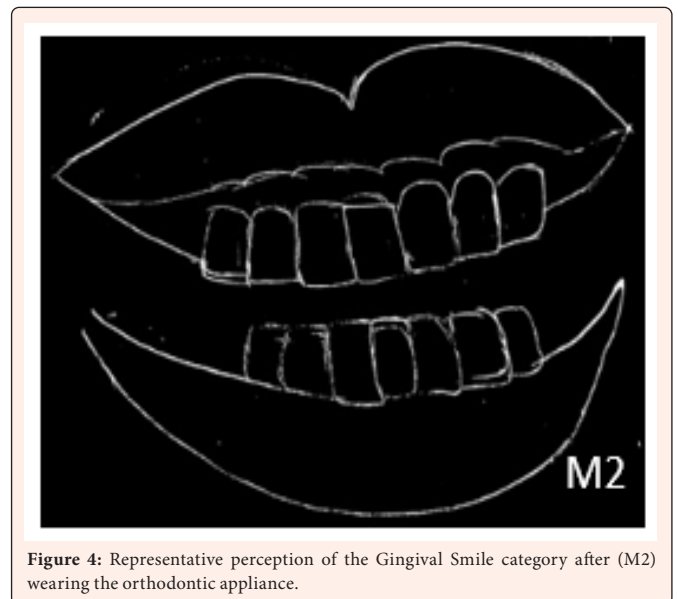
**Figure 2:** Percepts drawn from the Smile with Mouth Corridors subcategory, before (M1) and after (M2) the use of orthodontic braces.

The Upper Smile is defined according to Freitas Magalhães (2011) by the display of the upper dental row with the symbolic equivalent in the same category, -the smile arch-, classified by Sarver in 2001 [5,6]. According to the Upper Smile subcategory, 8 individuals (8%) drew this type of smile in M1 and only 3 (3%) individuals drew this smile category in M2 (Figure 3).



**Figure 3:** Representative perception of the Upper Smile category before (M1) and after (M2) wearing braces.

With regard to the Gingival Smile subcategory, only 1 individual (2%) drew this smile category in (M2). According to several authors, this type of smile results from excessive gum exposure [10,11]. Along these lines, and in comparison, with previous studies [11], the gummy smile was drawn for the first time in adult subjects, in the present study (Figure 4).



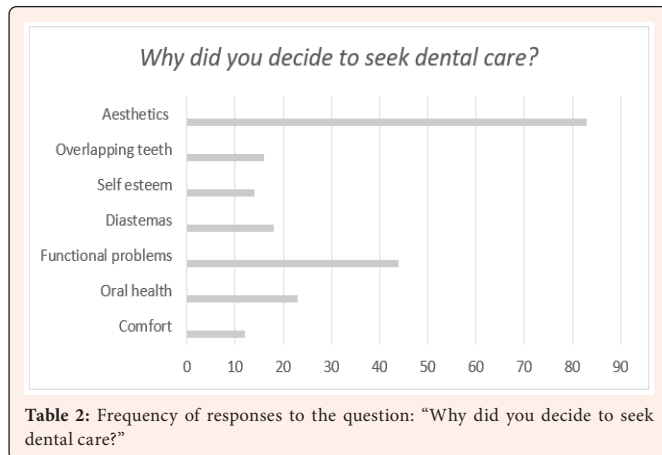
**Figure 4:** Representative perception of the Gingival Smile category after (M2) wearing the orthodontic appliance.

According to Table 1, when we compare the results obtained at the two different moments, 4 categories show notable differences between M1 and M2, thus showing changes in the subjects' mental representation before and after wearing the orthodontic appliance: (i)-Tooth Alignment, since only 30% of subjects drew aligned teeth before braces and almost all subjects (99%) drew aligned teeth after braces; (ii)-tooth crowding, since more than half of subjects (63%) drew crowded teeth before braces (M1) and no subject (0%) drew crowded teeth in M2. We can therefore conclude that, dental crowding is a major concern for the subjects in this sample, since no one drew crowded teeth after wearing braces(M2). (iii) - Diastemas - when we analyzed the Diastemas subcategory, we concluded that 64% of the subjects in the study drew teeth with diastemas in M1, and only 5% of the subjects drew diastemas in M2. We therefore conclude that Diastemas are another relevant subcategory for this sample, since few subjects represented their smile with Diastemas after (M2) wearing braces. (iv)- Irregular Sizes, another subcategory that stood out in the percepts drawn was Tooth Size, in that 83% of the percepts drawn by the subjects before wearing braces (M1) showed irregularly sized teeth, but only 28% of the subjects represented teeth of different sizes after wearing braces (M2). Comparing the results of this study, carried out with a population of adult subjects, with previous studies carried out with children and adolescents, we see that in relation to the Diastemas Category, young people and adults seem to be in the same analytical equation, since in both studies, no subject drew Diastemas in M2. Therefore, we can consider Diastemas as an "aesthetically achievable condition" for a smile considered Perfect for both samples. Another subcategory that seems to decrease dramatically in frequency in adults and young people is Dental Alignment, a fact that can also be considered a limiting factor in achieving a Perfect Smile [1-4].

**Table 1:** Frequency of the subcategories found in the Teeth category in the drawings before (M1) and after (M2) the use of the orthodontic appliance.

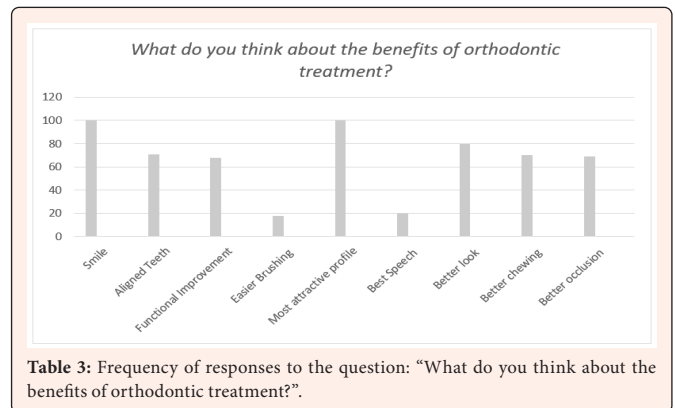
Teeth	Self-portrait - BEFORE		Self-portrait - AFTER	
	N	%	N	%
Aligned	30	30%	99	99%
Misaligned	70	70%	1	1%
Crowded	63	63%	0	0%
Irregular sizes	83	83%	28	28%
Agenesis	1	1%	0	0%
Diastemas	64	64%	5	5%
Fractured teeth	1	1%	0	0%
Serrated surface teeth	4	4%	0	0%
Without diastema	36	36%	95	95%
Unfractured teeth	99	99%	100	100%
Without maxillary implant	4	4%	5	5%

On the other hand, when the patients were asked about the reasons that led them to seek dental care (Table 2), we can conclude that the main reason was associated with aesthetic issues, followed by functional problems, thus contradicting the results obtained in previous studies with an adolescent population, which assume that the main reason for seeking orthodontic care is functional problems - Orthodontic Smile [1,3].



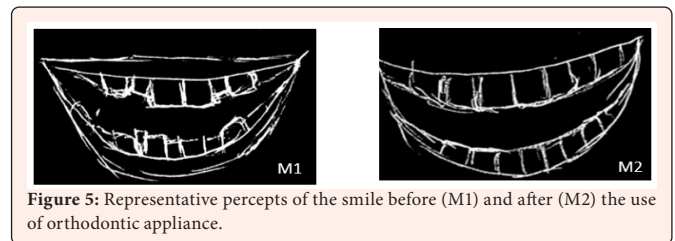
**Table 2:** Frequency of responses to the question: “Why did you decide to seek dental care?”

Patients were also asked about the benefits of orthodontic treatment, and once again, when we analyzed the answers to this question (Table 3), we found that in terms of content analysis (frequencies) of the narrative categories that were created, 100% of respondents answered that orthodontic treatment contributes to a better smile and a more attractive profile, thus concluding once again that adult subjects prioritize aesthetic issues over functional ones [6].



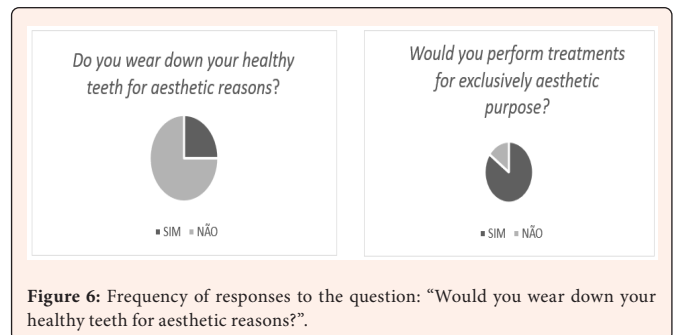
**Table 3:** Frequency of responses to the question: “What do you think about the benefits of orthodontic treatment?”.

The results obtained using the pictorial content analysis grid of the percepts, also reveal some differences in terms of self-perception of the oral cavity (Mouth/Smile), before (M1) and after (M2), the use of the orthodontic appliance, since in M2 more detailed drawings were obtained and more pictorially invested by the subjects, with more Aligned Teeth and no Diastemas (Figure 5).



**Figure 5:** Representative percepts of the smile before (M1) and after (M2) the use of orthodontic appliance.

On the other hand, we highlight the fact that, after (M2) orthodontic treatment, the respondents showed an improved perception of the anatomical characteristics of the oral cavity and its functional preservation. In fact, when asked whether they underwent treatment exclusively for aesthetic purposes, 85 subjects (85%) responded positively (Figure 6), as opposed to 85 subjects (85%) who responded negatively (Figure 7), when considering the therapeutic hypothesis of teeth being worn down for aesthetic reasons.



**Figure 6:** Frequency of responses to the question: “Would you wear down your healthy teeth for aesthetic reasons?”.



## Conclusion

When we compare the perceptions drawn, before (M1) and after (M2) the use of an orthodontic appliance, we can conclude that, in the main, aesthetic motives seem to be the true motivational leverages for subjects in adulthood when they decide to seek orthodontic care. However, when subjects were questioned about the aesthetic relevance of treatment involving the grinding of healthy teeth for aesthetic purposes only, the vast majority did not adhere to this therapeutic suggestion. It should also be noted that after orthodontic treatment (M2) respondents seemed to have internalized anatomical features that are peculiar to an Aesthetic Smile, to the extent that the drawings they made seemed to be more invested and, curiously, there was an increase in the number of teeth drawn on the perceptions at M2. In this line of analysis, the results obtained suggest that the main reasons that led patients to seek dental care seem to be more connected to Aesthetic problems, namely the search for an Aligned and Aesthetically Harmonious Smile.

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