THE IMPACT OF THE FACIAL SKELETAL CLASS ON THE PSYCHOLOGICAL PROFILE: AN EPIDEMIOLOGICAL SURVEY ON YOUNG ITALIAN ADULTS.

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Key words: Epidemiology, DMFT, CPITN, MMPI

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Abstract

Purpose: The facial region plays a major role in determining physical attractiveness. We assess the hypothesis that the capability of successfully managing interpersonal relationships in young adults might be related to the facial skeletal class. Materials and Methods: 1014 young subjects applying to the Military Academy of Pozzuoli, Italy, were enrolled and the cephalometric evaluation was performed by calculating the angular relationships between skeletal points localized by the facial-latero-lateral rx, sorting the subjects in three groups corresponding to each major facial skeletal class. Concurrently, the subjects were evaluated by a team of psychiatrists administering the MMPI test followed by a brief colloquium, in order to identify those subjects characterized by low skills for managing interpersonal relationships.

Results: According to the psychiatric evaluation about 20% of the sample was considered inadequate to manage successfully interpersonal relationships. Males displayed a two-fold increased risk of being inadequate. No differences were shown in the distribution of the inadequate male subjects among the three different facial skeletal classes. Otherwise, inadequate females displayed a different distribution among the three facial skeletal classes, with a trend of about two-fold and four-fold, respectively, for those subjects belonging to classes II and III, respect to those belonging to class I.

Conclusion: Females seem more sensible to physical factors determining beauty, such as the facial morphology. Therefore, we may suggest that improvements made to a young adult’s oral region might have an important impact on his capacity of successfully managing interpersonal relationships, especially considering female subjects possibly due to cultural and/or social reasons.
Introduction

Physical attractiveness has been shown to play a major role in determining both one person’s self-esteem and his/her capability of managing social relationships (Patzer 1996; Dion et al. 1972; Miller 1970; Berscheid and Walster 1972). Moreover, attractive individuals are more frequently regarded as desirable friends and they are considered to be socially skilled. Interestingly, in a study conducted by Efran (1974), attractive individuals were more easily judged as less guilty in a simulated jury task, and less severe punishment were recommended.

The influence of dentofacial appearance on social attractiveness has been extensively studied. For example, Shaw and colleagues, among others, clearly demonstrated that dental arrangement plays a major role in determining the perceived beauty and success of one person (Shaw et al. 1985; Shaw et al. 1980; Shaw 1981; Kerosuo et al. 1995; Sergl and Stodt 1970).

However, it is conceivable that the facial skeletal structure has a greater esthetic and physiologic impact on one subject than dental morphology alone (Jefferson 1996). As a matter of fact, Michiels and Sather (1994) reported that a sample of white women was judged as less attractive if displaying increased vertical features or convex or facial class II tendency profiles.

Hence, in this study, our aim was to investigate if a particular facial skeletal class was somehow related to the capacity of successfully managing interpersonal relationships in a population of young Italian adults.
Possibly this study might contribute to understand the structural determinants of the perceived beauty, which might be helpful when planning specific surgical and/or orthodontic intervention.

**Materials and Methods.**

1014 consecutive subjects (M/F: 776/248; mean age ± SD: 19.8 ± 2.5 y.o.) applying to the military academy of Pozzuoli, Italy, were enrolled following explanation of the aims of the study. Each candidate underwent to a complete dental evaluation by two dentists, trained in the WHO Collaborating Centre for Epidemiology and Community Dentistry of Milan, Italy. Subjects that previously underwent to maxillo-facial surgery or fixed orthodontic treatment were excluded. The skeletal class determination was performed by calculating the angular relationship between nasion (N), sellion (S), and Down’s points A and B, obtained from the latero-lateral rx projection of the face. Subsequently, the skeletal classes were defined on the basis of the ANB angle as follows: ANB = 2 ± 2, I class; ANB > 4, II class; ANB < 0, III class (Bequain, 1982).

The evaluation of the capacity of managing interpersonal relationships was performed by a team of board-qualified psychiatrists by administering the Minnesota Multiphasic Personality Inventory-2 “MMPI-22 (Sellbom et al. 2005) followed by a brief colloquium with each candidate. According to the psychiatric evaluation each subject was judged either as qualified (Q) or not-qualified (NQ) to manage successfully interpersonal relationships.
Statistical analysis was performed by using EpiInfo™ 3.3. Differences among classes were calculated by the $\chi^2$ test. Linear trends in proportion were tested using $\chi^2$ test for trend (Mantel, 1963).

**Results**

According to the evaluation of the psychiatrists about 20% of the subjects were discharged since they were not-qualified (NQ) for successfully managing interpersonal relationships. Male subjects displayed an about two-fold increased risk of being NQ with respect to the other sex ($\chi^2$ 14.69, p<0.0002; odds ratio = 2.33, 95% confidence interval: 1.47 – 3.71; see Figure 1).

The analysis of the contingency table failed to show a difference in the distribution of NQ subjects among the three facial skeletal classes. However, when sex stratification was performed the analysis indicated that females displayed a different distribution among the three facial skeletal classes ($\chi^2$ 9.21, p = 0.01; Table 1). In fact, the odds ratio were 2.17 (0.69 - 6.61, 95% confidence interval) and 4.61 (1.36 - 15.27, 95% confidence interval) for female subjects belonging to the second and the third class, respectively, with respect to the subjects belonging to the first class (see Table 1). Moreover, a linear trend was shown going from the first to the third class ($\chi^2$ for linear trend 9.011, p<0.001).

On the other hand, no significant differences were shown in the distribution of NQ male subjects among the three skeletal classes (Table 2).

**Discussion**
In this study we investigated the relationship between the facial skeletal class and the capacity of managing interpersonal relationships in a sample of young Italian adults applying to the military academy of Pozzuoli, Italy. We chose this particular population because it had the advantage of being highly homogeneous for age, and, possibly, more sensible to those factors determining social and physical appearance. Moreover, the sample of this study had the advantage of being heterogeneous for geographical provenience and, therefore, more representative of the Italian population with respect to regionally conducted surveys.

On the other hand, it is necessary to clarify that the sample study recruited in this study might not accurately represent the situation of an age-matched general population, since a possible selection bias might occur. In fact, those individuals applying to the military academy might differ from the general population both for facial morphology and/or psychological characteristics. Moreover, the number of enrolled females is about one third with respect to the other sex, presumably further amplifying the possible selection bias for this specific subgroup, considering the small number of subjects that were recruited. Furthermore, it might be theoretically possible that the psychiatric evaluation itself might be biased due to the different attractiveness of the recruited subjects. In fact, we can not rule out the possibility that the psychiatrists judged more frequently as NQ those subjects he perceived as being less beautiful, although the application of the MMPI test was introduced in order to limit this phenomenon.

Nevertheless, our data clearly indicate that male subjects display an increased risk with respect to females of being NQ but not related to the particular facial skeletal class. On the other hand, female subjects display a lower risk with respect to their counterpart but
strongly associated to the particular facial skeletal structure. A possible explanation of this evidence might be indicated in a hypothetical higher susceptibility of female individuals to physical factors determining beauty, such as the facial skeletal class is (Campbell 2004). As a matter of fact, possibly for cultural reasons, social pressure to be physically attractive might be stronger on female individuals with respect to males, hypothetically resulting in higher vulnerability to develop psychological problems when not fulfilling completely with the society expectancies and demands (Marcus and Miller 2003).

However, we would like to remark that it is not possible to rule out the hypothesis that alternative explanations might have generated the observed results. For example, although improbable, there might be a theoretical genetic predisposition to develop both a specific dental class, and a particular psychological profile. Therefore, further investigation on this topic might contribute to confirm our findings and clarify these issues.

Finally, considering the reported findings, we would like to conclude by suggesting that improvements on the facial region by surgical/orthodontic early intervention might have a significant beneficial impact on the capacity of managing successfully interpersonal relationships in young adults, especially when considering female subjects since possibly more sensible to this issue.
References


4. Efran MC. The effect of physical appearance on the judgment of guilt, interpersonal attraction and severity of recommended punishment in a simulated jury task. Journal of Research in Personality 1974;8:45-54.


Distribution (number of subjects and percentage) of female individuals among the three different facial skeletal classes. Subjects were sorted either as qualified (Q) or not-qualified (NQ) to manage interpersonal relationships, according to the psychiatric evaluation.

<table>
<thead>
<tr>
<th></th>
<th>I Class</th>
<th>II Class</th>
<th>III Class</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>172 (69.35)</td>
<td>34 (13.71)</td>
<td>16 (6.45)</td>
<td>222 (89.52)</td>
</tr>
<tr>
<td>NQ</td>
<td>14 (5.65)</td>
<td>6 (2.42)</td>
<td>6 (2.42)</td>
<td>26 (10.48)</td>
</tr>
<tr>
<td>Total</td>
<td>186 (75.00)</td>
<td>40 (16.13)</td>
<td>22 (8.87)</td>
<td>248</td>
</tr>
</tbody>
</table>

$\chi^2 = 9.21, p = 0.01$. 
Table 2. Distribution (number of subjects and percentage) of males individuals among the three different facial skeletal classes. Subjects were sorted either as qualified (Q) or not-qualified (NQ) to manage interpersonal relationships, according to the psychiatric evaluation.

<table>
<thead>
<tr>
<th></th>
<th>I Class ( n(%) )</th>
<th>II Class ( n(%) )</th>
<th>III Class ( n(%) )</th>
<th>Total ( n(%) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>416 (54.31)</td>
<td>80 (10.44)</td>
<td>106 (13.84)</td>
<td>602 (78.59)</td>
</tr>
<tr>
<td>NQ</td>
<td>110 (14.36)</td>
<td>22 (2.87)</td>
<td>32 (4.18)</td>
<td>164 (21.41)</td>
</tr>
<tr>
<td>Total</td>
<td>526 (68.67)</td>
<td>102 (13.32)</td>
<td>138 (18.02)</td>
<td>766</td>
</tr>
</tbody>
</table>

\( \chi^2 = 3.55, \ p=0.17 \).
Figure 1. Number of subjects which were judged either as qualified (Q, white bar), or not-qualified (NQ, black bar) in order to manage interpersonal relationships according to the psychiatric evaluation. The percentage of NQ individuals on the total number of subjects included in each group is displayed over the corresponding black bar.
Figure 1