For thousands of years, humans have struggled with the question of what it is that constitutes human beauty, and although the canons of beauty differ from culture to culture and over time, the fundamental answer seems to rest in the study of proportion. In the 5th century BCE, Polycleitus, a Greek sculptor, pondered the ideal proportions of the human body, and during the Renaissance, Leonardo Da Vinci studied the proportions of the human head. Scientists, artists, and philosophers became more and more aware of the central mathematical/geometrical governance in nature and investigated and applied the rules of symmetry to the lines, parts, and angles of the face. In an endeavor to reveal and reproduce the magic of beauty and attractiveness, the eyes, the mouth, with or without the teeth, and the nose have been recognized as playing a crucial role in perceived attractiveness. In recent decades, research has focused on the quantification of dental and facial esthetics in an attempt to improve the results of prosthodontic, periodontal, and orthodontic treatment.

In Contemporary Orthodontics, Proffit et al² discuss the hierarchy of esthetics, with macroesthetics being the face in all 3 planes of space; miniesthetics being the smile framework bordered by the lips on smile animation. This includes gingival display and height, excessive buccal corridors, and smile arc coincidence. Finally, the term microesthetics refers to the teeth by means of proportions of height and width, gingival shape and contour, black triangles, and shade. However, the correlation among macro-, mini-, and microesthetics has not been investigated.

In 1973, Lombardi³ introduced the concept of a relationship between attractiveness and parallelism, considering “attractiveness as resulting from a general sense of parallelism between structural facial features, accepting parallelism as the most harmonious relation

ABSTRACT

Statement of problem. Whether deviations in the angulation discrepancy between the intercanine and interpupillary line significantly affect attractiveness is unknown.

Purpose. The purpose of this prospective study was to quantify dental and facial esthetics to determine whether smile angulation discrepancies in individuals identified as having attractive smiles are smaller than those in the average population.

Material and methods. An Internet search for “best smile” and “celebrity” identified 108 celebrities (Test group). Photographs showing smiles within 10 degrees of a frontal view were gathered. In mannequin testing, small head rotation (<10 degrees) was found not to affect the measurements. Photographs of dental students were used for the control group. The angulation discrepancy between the intercanine and interpupillary line was measured using computer software. Groups were compared using the Mann-Whitney U test (α=.05).

Results. Usable photographs were obtained for 94 celebrities (62 women, 32 men) and were compared with photographs of 97 dental students (54 women, 43 men). Significant (P<.01) differences in angulation discrepancy were found, with celebrities having smaller mean angulation discrepancies (0.97 degrees) than dental students (1.33 degrees). The differences between men and women were not statistically significant (P>.05).

Conclusions. Celebrities identified as having “best smile” had significantly smaller mean angulation discrepancies than the control group. (J Prosthet Dent 2016; - - - -)

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Clinical Implications
This study highlights the role that symmetry and parallelism play through dental elements in the perception and interpretation of beauty. Clinicians should attempt to reconstruct the parallelism between the intercanine and interpupillary lines.

between two lines.” Among several geometric features, the interpupillary line was determined as a straight line that passes through the center of the eyes (pupils), representing, when parallel to the horizontal plane, the “most suitable reference” for carrying out correct facial analysis. Naylor, however, focused on the importance of primarily horizontal rather than vertical parallelism, identifying the need for a coincidence between the commissural line and the line running from one tip of the one canine to the other (intercanine line). This line has been identified as the occlusal line or occlusal plane and is considered as a prerequisite for smile attractiveness.

Kiekens et al investigated both frontal and lateral angles and ratios and correlated them with perceived attractiveness. The authors included 76 laypersons who reviewed pictures of 64 adults and rated them on a visual analog scale (VAS). The esthetic value was subsequently calculated as a mean VAS score. Forty-five landmarks were identified, and ratios and angles (27 on the frontal projection and 26 on the lateral projection) were calculated for each participant. The deviation from those recognized in the published reports as ideal was determined and also related to the VAS score. The authors concluded that 3 lateral angles and 2 frontal line ratios presented with a significant negative correlation with the VAS score, indicating that faces considered beautiful deviated less from an ideal prototype than less beautiful faces. Regarding the angles identified, these were the most protruded point of upper lip; skin nasion; and pogonion (Lsp-N-Pog); labrale superior; porion, and pogonion (Ls-Po-Pog); and the subnasale; the most protruded point on the upper lip; pogonion; and the most protruded point on the lower lip (Sn-Lsp-/Pog-Lip). From the frontal view, the ratios negatively correlated with the perceived attractiveness around the eye region, whereas from the lateral view, perceived attractiveness correlated to the angles of the lips. Furthermore, Langlois et al, who extensively evaluated 11 meta-analyses, demonstrated that raters of attractiveness agreed within and across cultures about who is or is not attractive; those recognized as attractive are favored even by raters who know them; attractive children and adults are treated more positively, even by raters who know them; and attractive children and adults display more positive traits and behaviors.

In an analytic study, Namano et al investigated several angles related to facial esthetics and found the existence of a range of asymmetries in a group of randomly selected participants. By interrelating the intercanine line with the horizontal plane, they found ranges from -5.2 to 5.2 degrees and -3.7 to 2.3 degrees. The interpupillary line, however, is a projection of a reference horizontal plane that determines the symmetrical order of the incisal, gingival, and occlusal planes; thus, the incisal cants of the anterior teeth, including the canines, are expected to be completely horizontal in attractive faces.

In an effort to identify the concealed relationship between structures (facial element-line angulation) and property (attractiveness), data from several sources must be taken into account. In this respect, the identification of edge and line elements, which can be aggregated to delineate object borders and other more global features, is considered a key stage in vision. However, Little and Jones stated that the presence of preference regarding esthetics may be highly independent of conscious recognition. Enquist and Arak, however, puzzled over the human sensitivity to symmetry. In their cornerstone work, the authors pointed out that a preference for symmetry may have arisen as a result of a biological necessity to recognize objects regardless of their location and orientation in a visual space, whereas the presence of sensory biases associated with symmetry might have been exploited autonomously by natural selection of biological signals and also by artistic human innovation. Very often, it seems, biological displays are symmetrical, and evidence is growing that receivers are also sensitive to such symmetries. This leads to the formulation of 2 hypotheses, first, that the evolution of this sensitivity is associated with the reflection of the symmetry and the quality of the signaler, and second, that the sensitivity may occur as a byproduct of the general properties of recognition systems in life.

Furthermore, several investigations have examined the presence of patterns associated with perceived attractiveness, and most have highlighted the importance of the presence of an axis for the perception of symmetry and consequently facial attractiveness. Several authors supported the superiority of the vertical axis, whereas others highlighted the formation of clusters rather than the presence of a single axis as a major determinant. Ricketts et al attempted to delineate the presence of a code implicated in the interaction between symmetry and perceived attractiveness by applying the divine proportion and Fibonacci series in facial esthetics. Although the study by Ricketts et al did
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