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Studying the relationships between the outlines of the face, maxillary central incisor, and maxillary arch in Jordanian adults by using Fourier analysis

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Abstract: The outline shapes of the dental arch, face, and tooth are esthetic factors used to determine the proper form of artificial teeth when selected for artificial prostheses. The purpose of this study was to investigate the quantitative relationships between the outlines of the face, the maxillary central incisor, and the maxillary arch by using Fourier analysis. Frontal facial photographs and irreversible hydrocolloid impressions of the maxilla were obtained from 200 young, dentate individuals (100 men, 100 women) ages 22 to 28 years. On the resultant casts, standardized photographs were made for the dental arch and the maxillary central incisor. The outlines of the face, dental arch, and tooth were digitally traced and the digitized curved outlines were converted into X-Y coordinates with special software, which, in turn, were imported into Fourier Shape Descriptor software for harmonic analysis. The quantitative outputs of Fourier analyses were analyzed and tested with statistical software to investigate the differences across the shapes of the 3 outlines under study. Facial and tooth outlines were similar for each sex, although the similarity was stronger among the men. By contrast, no relationship was found between tooth and maxillary arch outlines or between face and maxillary arch outlines. Face and tooth forms were quantitatively related. Therefore, face form may reliably guide the selection of artificial anterior tooth form in complete denture prostheses or any complex anterior restorations.