

## Annotation

# Dimensional Correspondences Between Deciduous and Permanent Teeth

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Although dimensional correspondence between individual deciduous teeth and their permanent successors have been explored for the "prediction" of permanent tooth sizes (HIXON and OLD-FATHER, *Angle Orthodont* 28:236, 1958) information derived from single-source data is still limited and to the mesiodistal dimension (LYSELL, *Sartryck ur Odontologisk Tidskrift* 65:571, 1957; LYSELL, *Acta Odontol Scand* 18:1, 1960; MOORREES and REED, *Arch Oral Biol* 9:685, 1964). Accordingly, we have explored dimensional correspondences between deciduous teeth and their successors in 208 boys and girls from the University of Michigan Growth Study making use of both mesiodistal and buccolingual crown diameters as derived from casts using optical-scanner (OPTOCOM) coordinates (VAN DER LINDEN et al, *J Dent Res* 51:1100, 1972).

Initial comparison of the paired tooth dimensions, taking boys and girls separately, showed no sex differences in the magnitude or trend of correlations. Accordingly, the sex-specific data were pooled to maximize sample size. When this was done, correlations between individual deciduous teeth and their permanent successors ranged from 0.23 to 0.61 for the mesiodistal diameters and 0.11 to 0.44 for the buccolingual diameters (Table). Overall, pooled correlations for the mesiodistal diameters ( $r = 0.41$ ) were slightly higher than corresponding pooled correlations for the buccolingual diameters ( $r = 0.32$ ), a difference that may be viewed as marginally significant. In general, the highest and lowest correlations for the mesiodistal and buccolingual diameters involved the same pairs of teeth, as summarized by a 0.69 rank-order correlation (RHO).

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TABLE

DIMENSIONAL CORRESPONDENCES BETWEEN DECIDUOUS AND PERMANENT TEETH

Teeth Compared	Mesiodistal dia N <sup>1</sup>	r	Buccolingual dia N <sup>1</sup>	r
Maxilla				
i <sup>1</sup> I <sup>1</sup>	160	0.50	158	0.42
i <sup>2</sup> I <sup>2</sup>	160	0.23	158	0.27
c C	133	0.25	133	0.11
dm <sup>1</sup> P <sup>1</sup>	137	0.61	137	0.44
dm <sup>2</sup> P <sup>2</sup>	111	0.43	111	0.34
Mandible				
i <sub>1</sub> I <sub>1</sub>	139	0.49	136	0.18
i <sub>2</sub> I <sub>2</sub>	167	0.47	166	0.27
c C	154	0.28	154	0.27
dm <sub>1</sub> P <sub>1</sub>	141	0.32	140	0.39
dm <sub>2</sub> P <sub>2</sub>	116	0.51	116	0.44
mean r		0.41 <sup>2</sup>		0.32 <sup>2</sup>

<sup>1</sup>No. of individuals.

<sup>2</sup>Rank order correlation between mesiodistal and buccolingual correlations equals 0.73.

With deciduous versus permanent crown-size correlations of the magnitudes shown, close "prediction" of permanent tooth diameters from deciduous predecessors is manifestly impractical. Even the highest multiple correlations involving estimation of P1 using dc, dml, and dm2 were no higher than 0.63. Nevertheless, it is impressive that dimensions of deciduous tooth crowns should show correspondences as high as 0.5 to 0.6 with the crowns of permanent teeth, even though the former may be completely developed not much later than the 7th month of gestation while the latter form as late as the 3rd and 4th years of life (cf GARN, LEWIS, and POLACHEK, *J Dent Res* 38:135, 1959). Clearly, common control mechanisms operating from prenatal time through the pre-school years are responsible for these deciduous-permanent crown size correspondences involving both conventional dimensions.