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**MOOrth Dissertation Title:**

*Digital images vs. orthodontic casts: assessment of malocclusion and orthodontic treatment need*

**Abstract**

**ABSTRACT**

*Objectives:* To investigate the potential use of two-dimensional digital images as an alternative to orthodontic casts in the assessment of malocclusion and orthodontic treatment need.

*Methods:* Assessment of malocclusion (Angle’s classification of molars, overjet and overbite) and orthodontic treatment need (Index of Orthodontic Treatment Need (IOTN): Dental Health Component (DHC) and Aesthetic Component (AC)) were conducted on 313 study casts and their images by 2 trained and calibrated examiners. Agreement of orthodontic treatment need and Angles’ molar classification were assessed employing Kappa statistics ($\kappa$). Agreement of overjet and overbite (measured in mm) were assessed in comparison and correlation analyses. Inter- and Intra-examiner reliability of assessments were investigated.

*Results:* There were substantial agreement of the molar relationship classifications ($\kappa > 0.70$), orthodontic treatment need as assessed by IOTN-DHC ($\kappa = 0.79$) and IOTN-AC ($\kappa = 0.56$) between measurements obtained from orthodontic casts and their images. There were also substantial agreements of measurements of overjet and overbite as obtained from orthodontic casts and their images. The standardized directional differences of overjet and overbite were $\leq 0.2$. The intraclass correlation coefficients of assessments of overjet and overbite obtained from orthodontic casts and their images were $> 0.90$. Inter- and intra-examiner reliability for the assessment of malocclusion and orthodontic treatment need were acceptable for digital images.

*Conclusion:* Two-dimensional digital images can be used as an alternative to casts in assessment of malocclusion and orthodontic treatment need.