

## Reliability and Validity of the OrthoMechanics Sequential Analyzer

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### ABSTRACT

**Purpose:** The aim of this study was to evaluate the reliability and validity of newly developed software in the assessment of orthodontic tooth movement three dimensionally. **Methods:** The sample consisted of pre- and post- treatment computed tomography scans and plaster dental models of 20 orthodontic subjects treated with a hyrax expander as a part of their comprehensive orthodontic treatment. Dental arch measurements, including arch widths, tooth inclinations and angulations, were measured on the scans using InvivoDental 3D imaging software version 5.1. The plaster dental models were laser scanned, superimposed, and measurements were obtained digitally using the new software. Agreement between the digital models and the CT measurements was evaluated using intraclass correlation coefficients (ICCs), paired t-tests, and Bland-Altman plots. A p-value of  $\leq 0.05$  was considered statistically significant. **Results:** High agreement (ICC > 0.9), a non-significant paired t-test, and no indication of agreement discrepancies were observed for most of the measured parameters. **Conclusions:** The new software program offers a valid and reliable tool concerning dental arch measurements obtained from 3D laser scanned models. It could be considered a possible practical method that helps the orthodontist evaluate the treatment progress in a non-invasive manner and without unnecessary radiation exposure. **Funding:** Indiana University Purdue University - Office of the Vice Chancellor for Research & the Funding Opportunities for Research Commercialization and Economics Success (FORCES).