VALIDITY AND RELIABILITY OF ROYAL LONDON SPACE ANALYSIS

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ABSTRACT

Aims: The purpose of this study was to investigate the validity and reliability of the Royal London Space Analysis and to evaluate its influence on orthodontic treatment decisions.

Method: Thirty-one case records were collected to represent various levels of crowding and different types of malocclusions. Seventeen examiners assessed these records and completed a data sheet that recorded information on their treatment decision. One month later, the examiners attended a course on the RLSA and then used the analysis to rescore the 31 cases. The models were also scored by the expert who led the course and these were then considered the 'gold standard' scores. After a further month, the examiners reapplied the RLSA and formulated a treatment plan for each set of patient records. A paired Student's t-test and intra-class correlation coefficient (ICC) were used to assess the agreement in scoring RLSA, a paired sample t–test was used to compare the scores with the gold standard, and finally the reliability in treatment planning was determined using kappa (κ) statistics.

Results and conclusions: The scores for lower arch crowding showed the highest inter-examiner agreement with an ICC of 0.93 whereas the lowest level of

agreement was for upper arch space requirement with an ICC of 0.77. Intra-examiner agreement was generally high, particularly for the assessment of lower arch crowding (ICC = 0.93) and lower arch space requirement (ICC = 0.88). There was excellent validity for all the examiners against the gold standard scores with a paired samples correlation ranging between 0.96 for lower arch crowding and 0.79 for upper arch space requirement. The intra-examiner reliability in treatment decision was only moderate, with an average κ value of 0.52 (maximum 0.82, minimum 0.24). Intra- and inter-examiner agreement for scoring the RLSA was acceptable. Nevertheless, the additional information obtained from the application of the RLSA did not have a substantial impact on the treatment decisions.