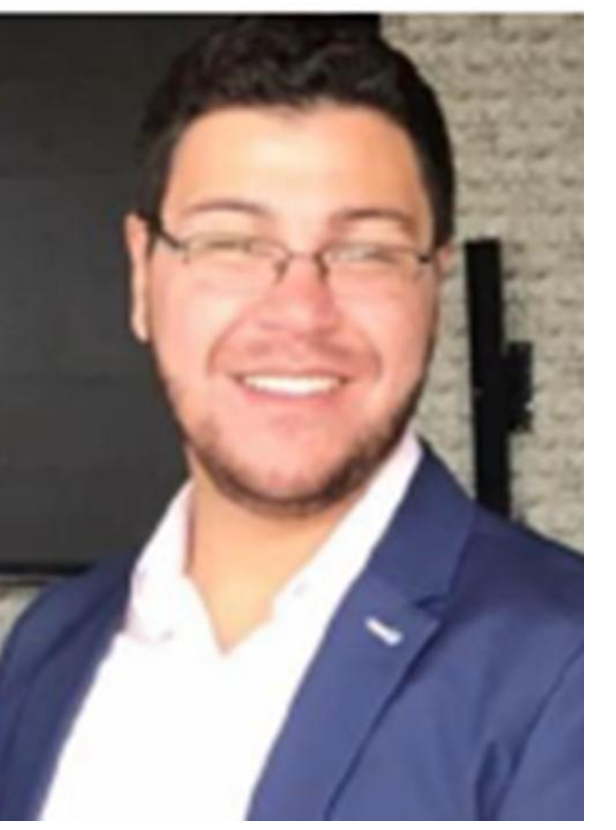


“Accuracy of Tooth Shade Determination of Intraoral Spectrophotometer versus two Intraoral Scanners: an in vitro study”



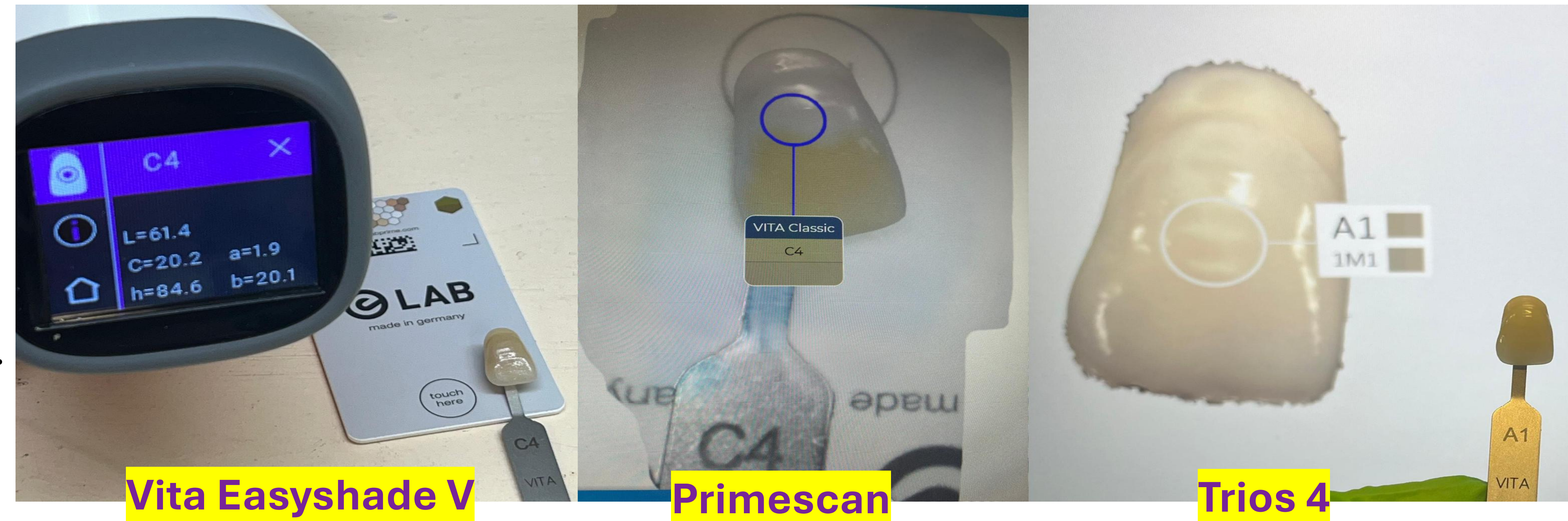
OBJECTIVE

This study aimed to evaluate and compare the accuracy of an intraoral spectrophotometer (Vita Easyshade V) and two digital intraoral scanners (Trios 4 and Primescan) in determining tooth shade.

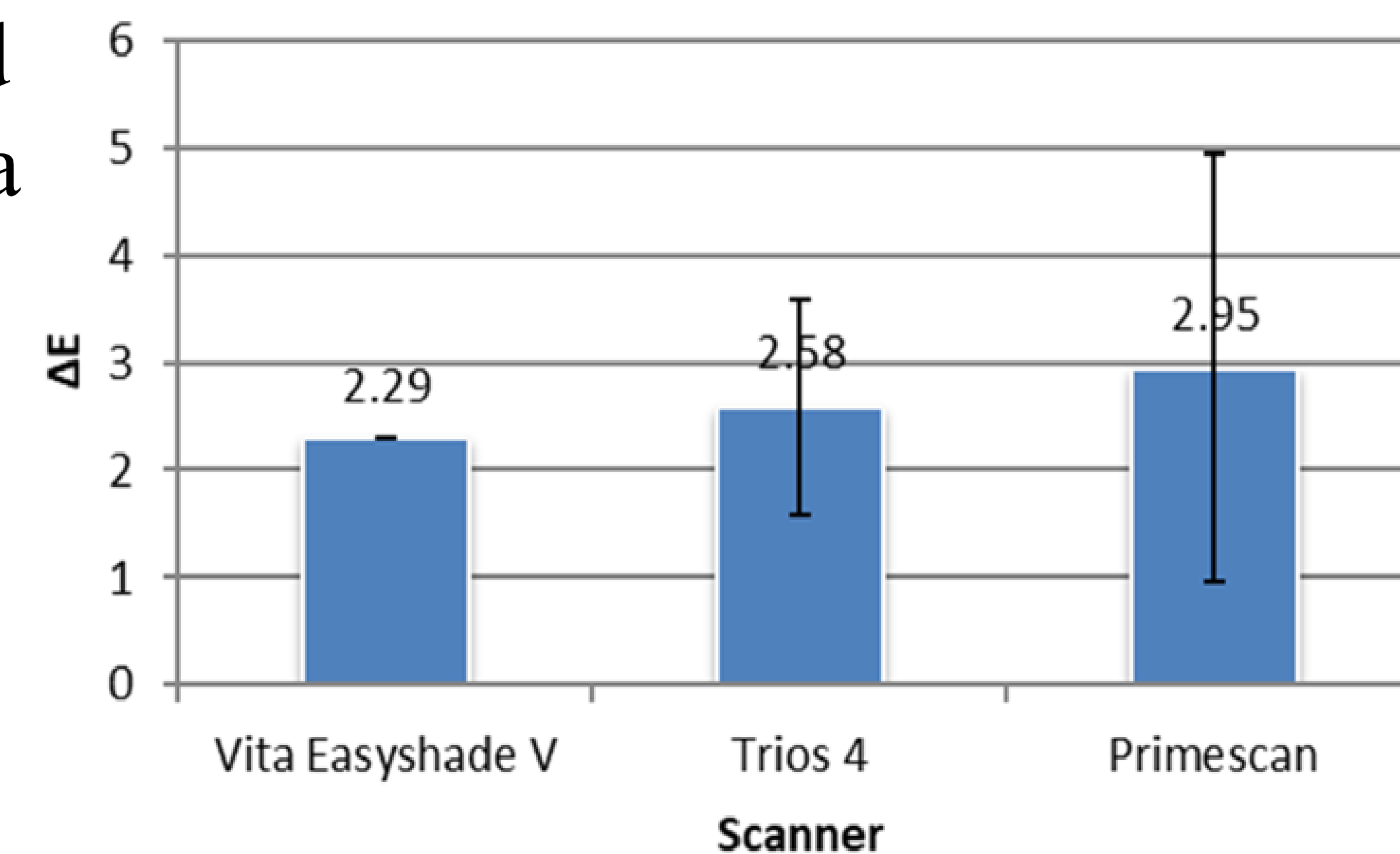
Materials and Methods

A simulated clinical model was created using shade tabs from the Vita Classical shade guide. Each instrument (Vita Easyshade V, Trios 4, and Primescan) was used to determine the shade of a shade tab (n=10 per instrument per each shade tab). Shade reported by each instrument was recorded and converted to CIE L*a*b* coordinates according to a reference measurement for each tab.

The color difference (ΔE) was then calculated for each measurement. In addition, value-based shade tab mismatch (ΔTab) was also recorded. All measurements were performed under standardized lighting and background conditions. Data were analyzed using two-way ANOVA and Tukey HSD tests with significance level set at 95%.

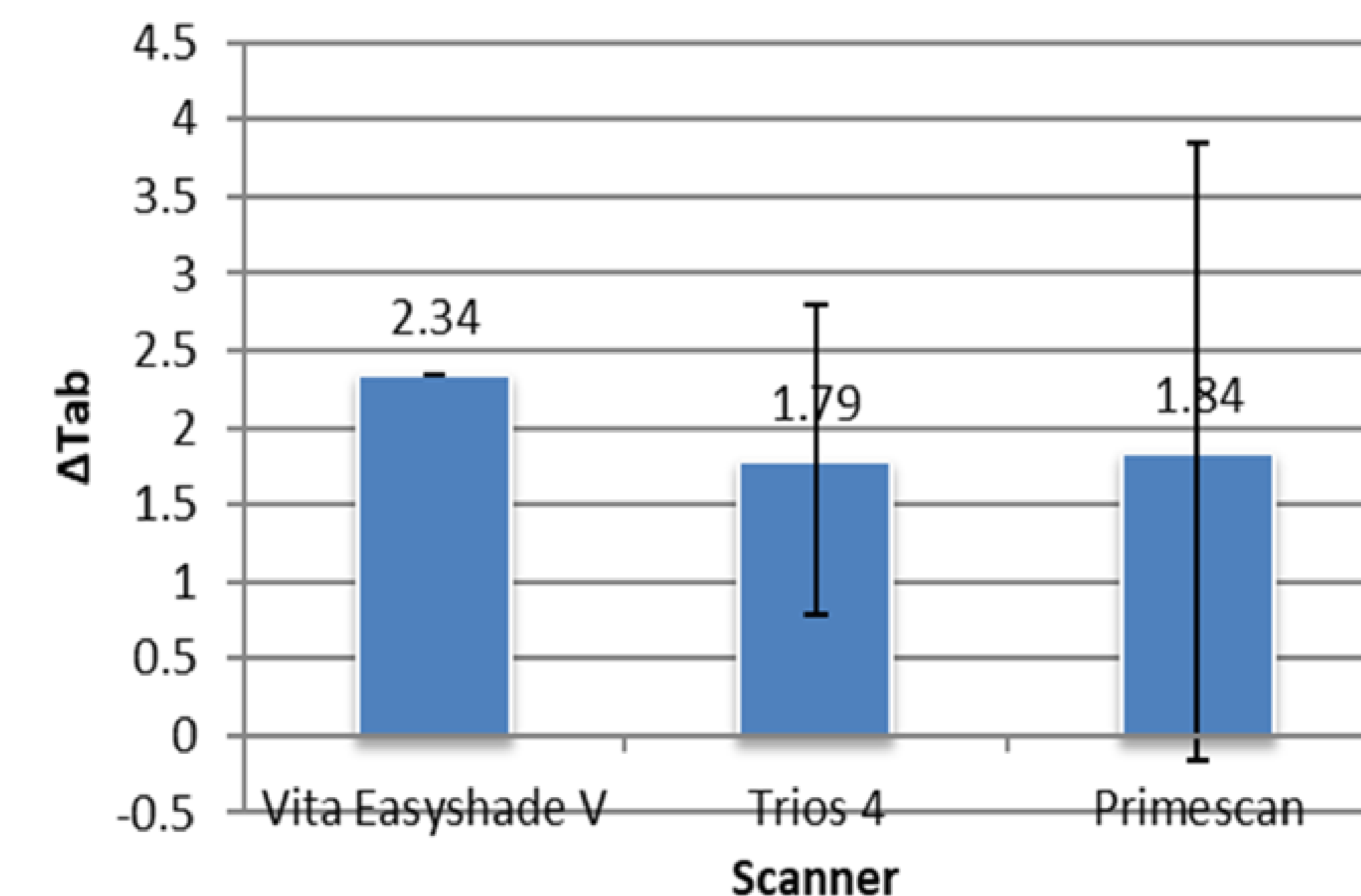


Mean ΔE with Standard Deviation



*** Vita Easyshade V vs Primescan:
 $p = 0.005$ (significant)**

Mean ΔTab with Standard Deviation



***Vita Easyshade V vs Trios 4 & Primescan:
 $p = 0.014 / 0.028$ (significant)**

CONCLUSIONS

Vita Easyshade V and Trios 4 demonstrated clinically acceptable color accuracy. However, Vita Easyshade V's higher ΔTab and Primescan's unacceptable ΔE suggest different patterns of error in determining the shade. **Both ΔE and ΔTab should be considered when assessing shade-matching reliability of an intraoral instrument.**

RESULTS

Mean ΔE values for all tested shade tabs was 2.29 ± 2.19 (Vita Easyshade V), 2.58 ± 2.45 (Trios 4), and 2.95 ± 2.44 (Primescan).

- Considering the perceptibility threshold ($\Delta E < 1.2$) all tested instruments resulted in perceptible color difference in reporting the shade.
- Considering the acceptability threshold ($\Delta E < 2.7$) Primescan was the only instrument exceeding the threshold.
- Vita Easyshade V showed the highest ΔTab (2.34 ± 2.58) followed by Trios 4 (1.79 ± 1.89) and Primescan (1.84 ± 1.89) with significant difference ($P < 0.05$).

