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ADVANCED SHADING SYSTEM IN LUNA 2, A NEW UNIVERSAL COMPOSITE

OBJECTIVES

To quantify and analyse the CIELAB colour parameters of new universal composite restorative Luna 2 (SDI Limited, Bayswater, Australia), and to demonstrate the relationship between shades in the VITA Classical range for ease of clinical use.

EXPERIMENTAL METHODS

Universal composite Luna 2 was analysed in VITA Classical shades A1-A4, B1-B3, C1-C3, D2-D3. For colour analysis, discs of each shade of Luna 2 composite were prepared according to ISO-4049:2019 using a Radii Xpert curing light (SDI Limited, 440-480nm). Discs were analysed within the CIELAB colour space using an X-Rite SP-64 spectrophotometer. Additionally, Luna 2 sample kits were distributed to clinicians worldwide for in-vivo clinical evaluation and asked to respond to a survey to assess clinical performance of the restorative, including ease and accuracy of shade matching (n=28).
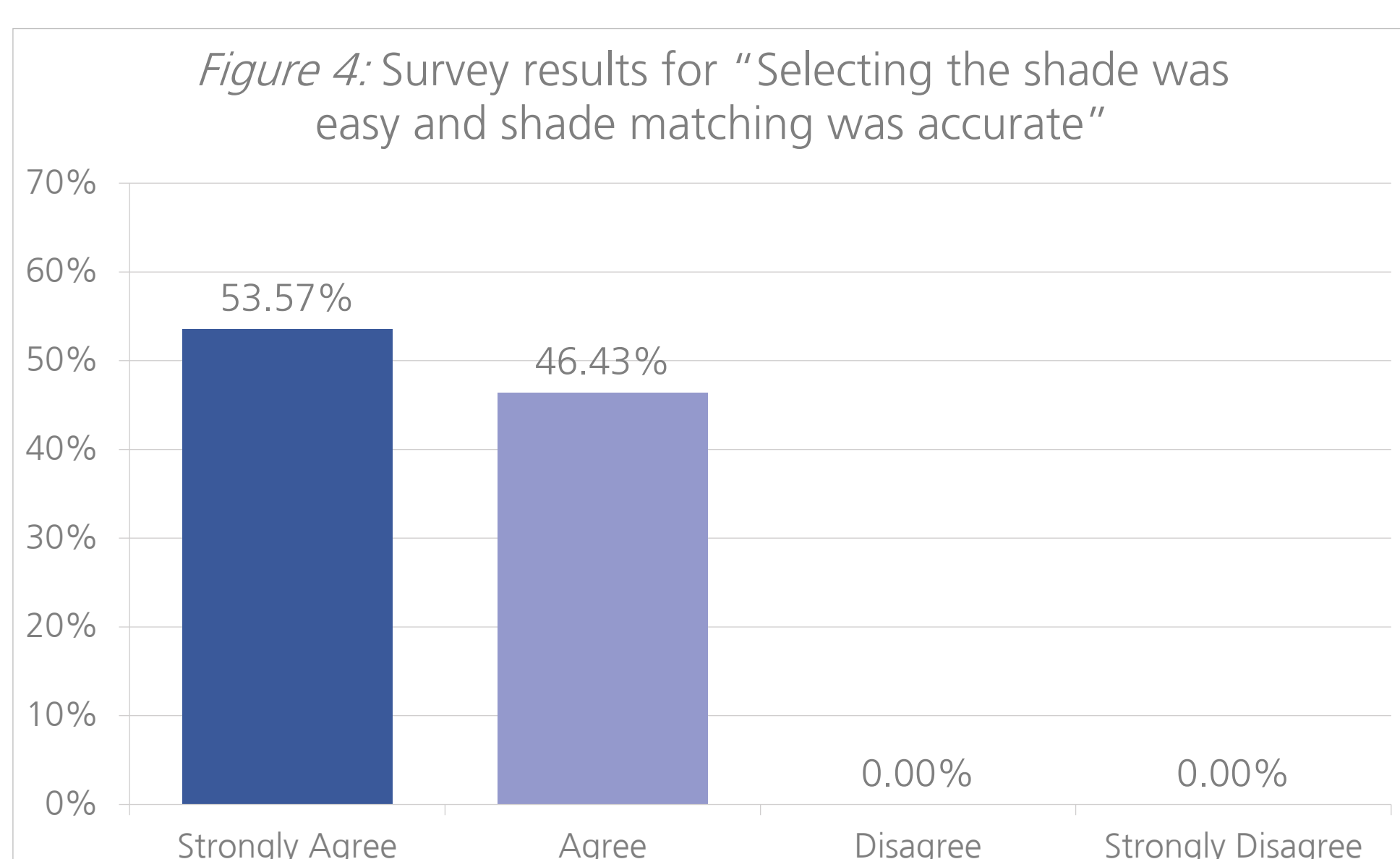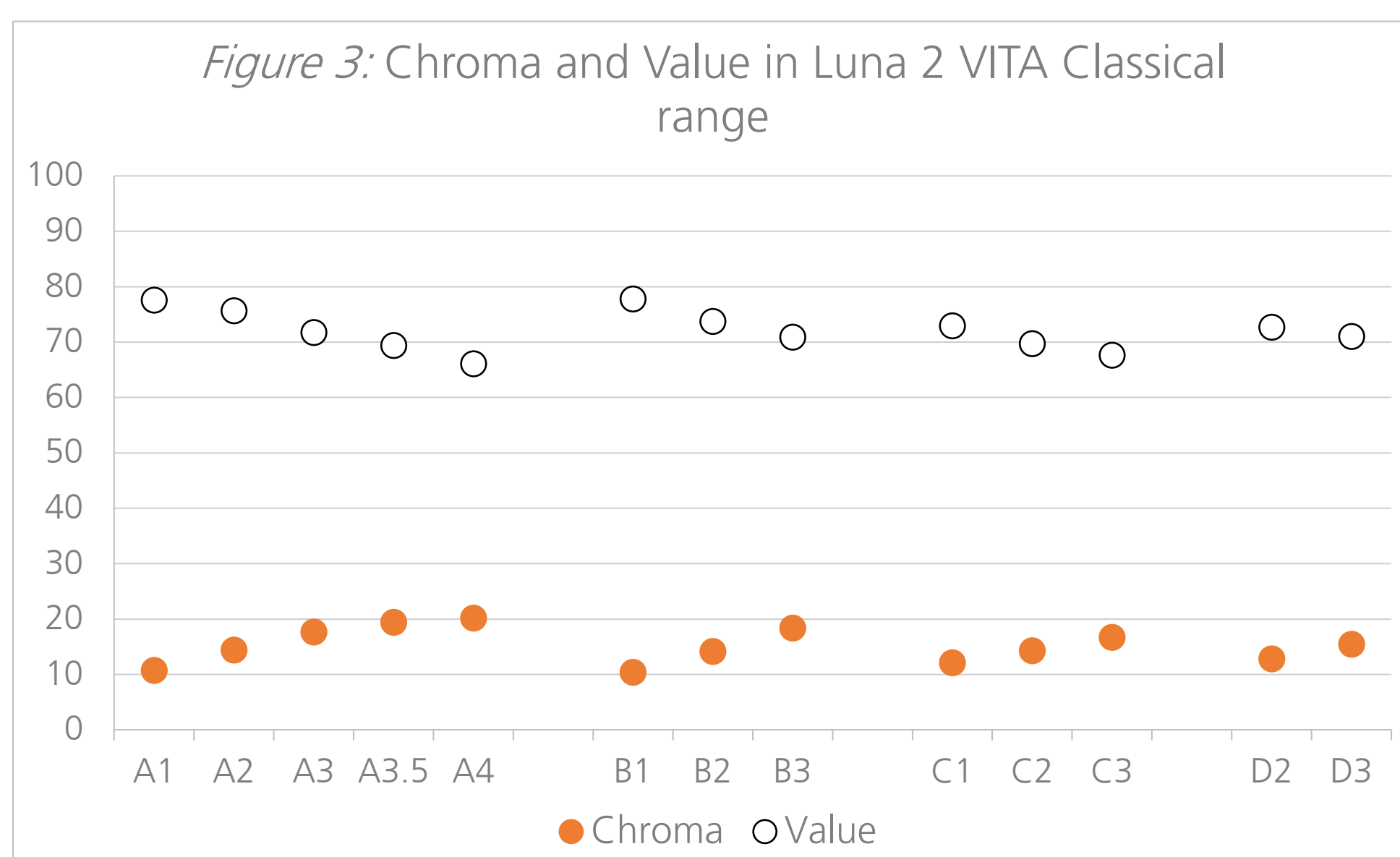

Figure 1: VITA Classical shade range and corresponding Luna 2 shades
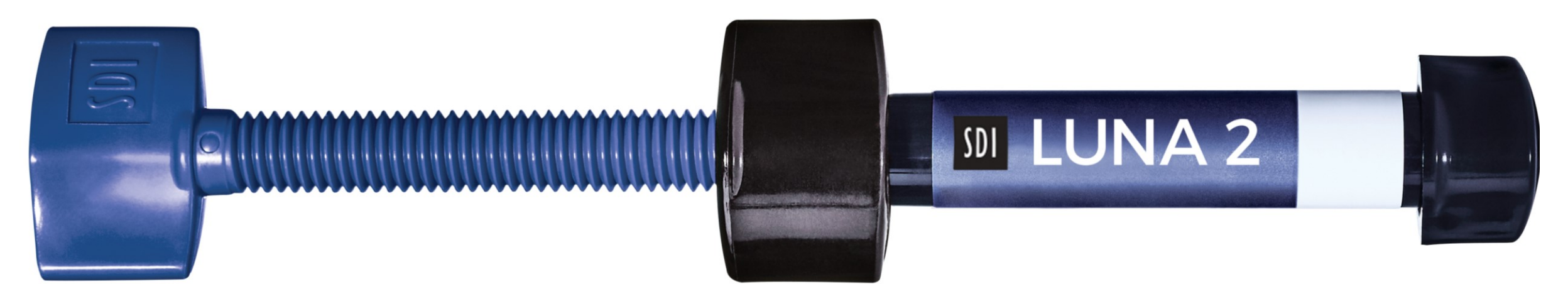
RESULTS AND DISCUSSION

Luna 2 composite discs were observed to have a close visual shade match to the VITA Classical shade guide *(Figure 1)*.

Figure 3: Chroma and Value in Luna 2 VITA Classical range

Figure 4: Survey results for "Selecting the shade was easy and shade matching was accurate"

Figure 5: Clinical case restored using Luna 2 (images courtesy of Dr. Jiovanne Neri - Brazil)

The 1976 CIELAB system is one of the most widely used colour spaces[1] and represents colour within a three-dimensional space *(Figure 2)*. In this space, data points are described by coordinates in the L*, a* and b* axes. The L* axis describes the lightness, or **value**, of the point, while the a* axis represents a scale of green (-) to red (+), and the b* axis represents a scale of blue (-) to yellow (+). The colour saturation, or **chroma**, is calculated according to the equation[2]:

$$C^*_{ab} = (a^{*\ 2} + b^{*\ 2})^{1/2}$$

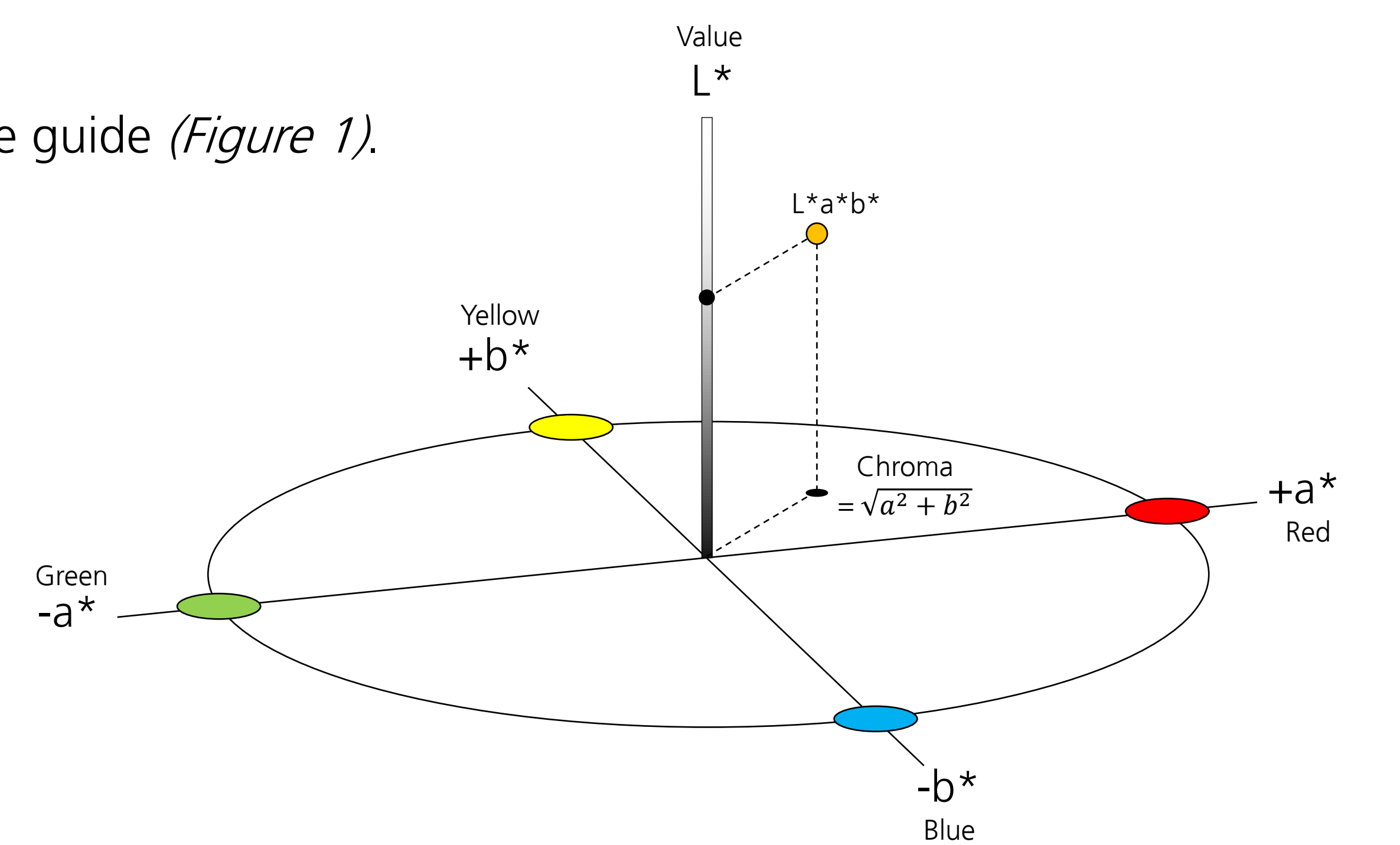*Figure 2:* CIELAB colour space, showing value and chroma of an L*a*b* data point

Trends were observed within Luna 2 VITA Classical groups A, B, C, and D. Within a single shade group, value showed a consistent decrease across shades *(Figure 3)*. Meanwhile, chroma increased across the group. This system demonstrates a simple and predictable relationship between shades within the VITA Classical range.

As part of an in-vivo clinical evaluation of the product, 100% of the 28 surveyed clinicians responded with "Agree" or "Strongly Agree" to the statement "Selecting the shade was easy and shade matching was accurate" *(Figure 4)*. The predictability of the Luna 2 advanced shading system allows for seamless shade matching and highly aesthetic clinical outcomes, as shown in *Figure 5*.

CONCLUSION

The CIELAB colour parameters of shades in the Luna 2 VITA Classical shade range demonstrate a linear progression across shade groups, with decreasing lightness and increasing colour saturation (chroma). The predictability of this system simplifies the shade selection process whilst ensuring a highly aesthetic result, supported in clinical use by 100% approval from surveyed dentists.

REFERENCES

[1]Durmus D. CIELAB color space boundaries under theoretical spectra and 99 test color samples. *Color Res Appl.* 2020; 45(5):796-802.
[2]Hajira N., Mehta D., Ashwini P., Meena N., Usha HL. Influence of different enamel shades and thickness on chroma and value of dentin VITA shade: an in vitro comparative assessment study. *J Contemp Dent Pract.* 2015; 16(4):304-309.