or smoother than untreated enamel. Nevertheless, the results of this study were mainly based on subjective qualitative assessment of enamel morphological characteristics. On the other hand, qualitative assessment by SEM and quantitative assessment of the amplitude parameter Ra by in-line stylus profilometry [21] showed that stripping disks and diamond-coated metal strips followed by fine Sof-Lex disks produced significantly rougher surfaces in comparison with the intact enamel of permanent and deciduous teeth. Qualitative (scanning electron microscopy) and quantitative (surface roughness test) measurements by Gupta et al. [22] also showed that the enamel after stripping with diamond disks and different polishing methods was significantly rougher than untreated control teeth. To improve the reliability of quantitative analysis, 3D optical profilometry was used to determine the Ra values by scanning sample areas rather than performing in-line analysis on enamel areas [23]. The results showed that grinding and polishing with automatic oscillating systems, including Ortho-Strips, resulted in equally smooth surfaces with untreated enamel, or even better. These systems are considered to provide better results than other common stripping techniques, where enamel defects have been observed [12,14,24].

The results of the present study failed to confirm the findings of the aforementioned studies for the Ortho-Strips system regarding the Sa amplitude parameter (the 3D equivalent to Ra). Moreover, all the parameters tested in the present study (amplitude, hybrid, functional) showed significantly increased values after stripping, except for Sci. Therefore, the null hypothesis should be partially rejected.

As previously considered [23], only the quantitative assessment of roughness parameters allows direct comparisons among surface treatments, without the subjective assessment bias of the SEM techniques. Since optical interferometric profilometry is a non-destructive technique, it may be sequentially used on the same specimens before and after stripping. In such experimental designs, as in the present study, measurements are taken at the same region of the same tooth before and after stripping, the values before stripping serving as controls. Therefore, the variability in roughness values of a separate control group is neutralized by expressing the difference (Δ) induced in surface roughness parameters at the same region of each individual specimen and compares the difference versus the zero value [17]. To further standardize the procedure, a ×20.3 magnification was used to analyze more enamel areas, whereas three regions were measured and averaged per surface and treatment to assure reproducibility. This experimental design provided a total number of 24 measurements for each condition and parameter, which resulted in an equal number of roughness value differences for evaluation.

An important issue, frequently overlooked, is that for the reason of comparison with previous literature, roughness parameters are limited only to Ra (in 2D) or Sa (in 3D) measurements. Although popular, Ra and Sa quantify the 'absolute' height or amplitude of the surface peaks or valleys (all considered as peaks) and are insensitive to their spatial distribution [16,25]. This is the reason for including three types of roughness parameters that were evaluated: amplitude, hybrid, and functional. In the amplitude parameters, besides the common Sa, the Sz was also included. Sz can discriminate between peaks and valleys, being more sensitive to Sa when studying wear effects, just like the stripping-induced effects on enamel. Sdr is related to slope sizes and provides information on the additional surface area produced from the surface texture in comparison with an ideal plane surface of the same size. Sci is associated with the relative retention of fluid the core surface structure provides, and Svi is linked to fluid retention at deepest valleys [16].

The results of the present study showed statistically significant differences in ΔSa, ΔSz, ΔSdr, and ΔSvi and no difference in ΔSci. The statistically significant difference found in the amplitude parameters Sa and Sz implies that the enamel surface left after stripping has higher peaks or/and deeper valleys in comparison with its native reference (intact enamel surface). This was clearly observed in the 3D profilometric images. Since increased amplitude heights (positive or negative) affect the peak and valley slopes, the enamel surface area is increased, a fact confirmed by the statistically significant difference found in ΔSdr. The absence of statistically significant differences in ΔSci implies that the core surface structure of enamel after stripping (excluding the 5% of the shallowest and the 20% of the deepest valleys as per Sci definition) provides the same fluid retention capacity as the intact control. However, in the Svi index, where the contribution of the 20% of the greatest valleys at the bearing ratio is taken into account, a statistically significant difference was found which could substantially increase the plaque retention capacity.

The differences in the profilometric methodology of the present study from the previous were as follows: a) The same surfaces of the specimens used as controls (intact enamel) were scanned before and after stripping (sequential treatment mode). This provides important advantages over the use of another series of specimens as a control group, since the same region is tested before and after in the sequential mode. b) More roughness parameters were tested to better characterize the enamel surfaces. The need for further polishing became evident from the results of the study. However, it is extremely difficult to use other types of interproximal polishing when the proximal reduction is 0.25 mm. Hand-operated finishing strips (i.e., for composite restorations) with a thickness of 0.10 to 0.15 mm may be used, but fail to fully adapt to the curved surface. Common Sof-Lex disks (stiff, urethane-backed/3M