



While waiting to develop strong tools to measure aesthetics beyond radiography, TRACE remains a reliable and inexpensive instrument for everyday use

Trunk aesthetics differ from the curve type and severity of the underlying scoliosis in adolescents

Conclusions

The tested aesthetic evaluations differ, and none show a clear superiority. Without a gold standard, the choice shall rely on reliability, validity, responsiveness, and clinical utility. Aesthetic and radiographic evaluations were weakly correlated. Nevertheless, each couple of evaluations (TRACE and aRSTa) showed coherent correlations (direction and quantity) between trunk areas and curve types/quantity, confirming that scoliosis is one of many underlying factors of aesthetics that we should explore in the future.

Results

We included 675 participants, age 13±2, curves 10-45°. Photographic and RST TRACE showed strong to very strong reliability: 0.73-0.96 intra-rater and 0.61-0.74 inter-rater.

We found absent to weak correlations between the aesthetic measures:

- photographic and RST TRACE (0.3) and sub-scores (0.02-0.4);
- RST TRACE and aRSTa (0.27-0.28) and sub-scores (0.06-0.29).

We found weak to moderate correlations between radiographic and aesthetic evaluations:

- RST TRACE (0.35-0.42);
- photographic TRACE (0.35-0.53), lumbar curves excluded;
- I_match aRSTa (-0.19/-0.44), thoracolumbar curves excluded;
- I_dist aRSTa (0.24-0.49), thoracolumbar and double curves excluded.

For TRACE evaluations, we obtained the best results for the waist sub-score in thoracic and thoracolumbar curves (0.44-0.46 and 0.54-0.56, respectively) and no correlations for shoulders and scapulae. For aRSTa, the best and worst results were for thoracic and thoracolumbar curves, respectively.

Methods

Study design. Cross-sectional observational controlled diagnostic study.

We included consecutive participants with trunk RST scan and standing radiograph/EOS within 2 months.

We developed two aRSTa (I_match and I_dist) following the TRACE principles (total score and shoulders, scapulae, hemithorax and waist sub-scores). We assessed TRACE on all RST images (RST TRACE) because the camera has a perspective from above the shoulders that differs from the clinical one. We checked the intra- and inter-rater test-retest reliability of photographic and RST TRACE in a subset of 28 randomly selected participants.

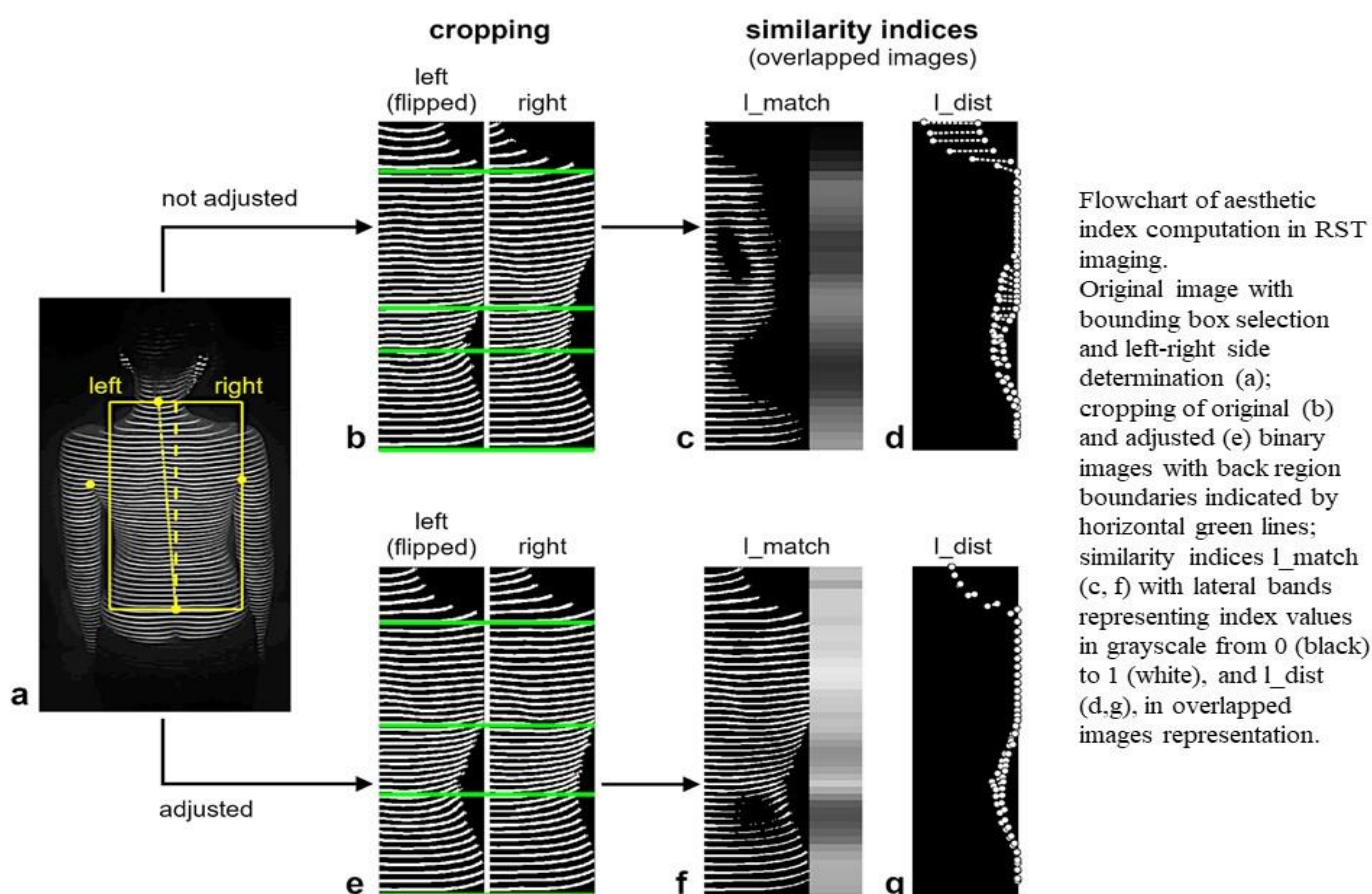
We checked the correlations among photographic and RST TRACE, aRSTa, scoliosis severity (°Cobb), and curve type using Kendall and Spearman tests and permutation distribution for statistical significance.

Background

Trunk aesthetics is an important goal of adolescent idiopathic scoliosis (AIS) treatment (1,2). Currently, subjective experience (questionnaires: e.g. Scoliosis Research Society 22 – SRS-22 and Trunk Appearance Perception Scale – TAPS) is explored more than objective data (symmetry indexes: e.g. Trunk Aesthetic Clinical Evaluation – TRACE and Posterior Trunk Symmetry Index – POTSI). Non-invasive imaging techniques, like rasterstereography (RST), have been studied for years to reduce the burden of radiographies for children with AIS, but they miss good correlations with Cobb degrees (3). Nevertheless, they could contribute to aesthetic evaluations by providing detailed trunk shape information.

Objective

To develop automated RST aesthetic evaluations (aRSTa) and check their correlations with TRACE (4,5) and scoliosis radiographic characteristics.



Bassani T, Negrini A, Rampi M, Parzini M, Negrini S

@ProfNegrini

stefano.negrini@unimi.it

rehabilitation.cochrane.org



UNIVERSITÀ DEGLI STUDI DI MILANO

I.R.C.C.S. Ospedale Galeazzi - Sant'Ambrogio
Gruppo San Donato

