Historically, science has tried to define beauty in its own terms. By quantifying beauty, science and medicine have attempted to treat esthetic shortfalls with some repeatability and reliability. The problem with many of these past (beauty analyses) approaches has been either subjective bias or oversight of influential factors.

In the early years of orthodontics and orthognathic surgery, plaster models were the treatment planning modality of choice. It was assumed that bite correction based on model diagnosis would achieve all facial and dental goals, including facial harmony. Experience has revealed that model diagnosis is incomplete\(^1\text{-}^3\). Model examination reveals inter-jaw occlusal discrepancies, but does not indicate which jaw is abnormally placed. Because of this, model-based overjet correction may leave facial imbalances uncorrected or even create facial decline\(^1\text{-}^3\).

As the study model approach proved ineffective, a second diagnostic technique emerged. Numerous osseous cephalometric analyses were developed to diagnose and select correct treatment. It was assumed that by placing the skeletal parts within the range of skeletal cephalometric norms that facial balance would be achieved and the result would be beauty. However, diagnosis of beauty by conventional osseous cephalometric
norms is unreliable. These cephalometric analyses concentrate mainly on the measurement of hard tissue structures, which are not consistently related to the soft tissues of the face. In addition, when different cephalometric analyses are used for the same patient, conflicting diagnoses emerge. Each analysis provides a different diagnosis, a different treatment plan, and, forcibly, a different facial outcome. Treatment based on cephalometric hard tissue norms in many instances may, in fact, create undesirable facial changes.

More recently, a third method of diagnosis has emerged. Clinicians have begun to select treatment based on direct facial examination and diagnosis. The assumption with this approach is that treating a face to “what looks beautiful” will produce a beautiful facial result. Models are analyzed, the hard tissues are evaluated, but the overriding key to treatment with this methodology lies in the clinician’s perception of the size, shape and position of facial soft tissue parts. While the benefit of this kind of treatment planning focuses attention on where esthetic problems truly exist, it is, unfortunately, rather subjective. Previously discussed analyses attempted to quantify beauty with mostly unsuccessful results. Facialy focused treatment planning offers improved results, but moves away from quantification. This allows subjective error to bias treatment planning and outcomes. The aim of this paper, then, is to discuss the elements of beauty and how each element influences the clinician’s perception of the face. By recognizing these influences, the clinician can overcome subjective bias and maximize the reliability and repeatability of beautiful results.

Two factors influence the perception of beauty — quality of facial parts (hair, eyes, etc.) and the position of the facial parts (chin projection, symmetry, etc.).
The quality of facial parts makes the most significant impact on the perception of beauty. Quality is described with terms, such as color, sheen, texture, wave, etc. The quality of the hair, eyes, eyelashes, teeth, gingiva, skin and lips is of primary importance to beauty. Quality of parts is subjectively interpreted and can have a very emotional influence on the observer’s discernment of the face as beautiful or not. Alteration of quality is the thrust of most readily available cosmetics and procedures. Skin resurfacing, tooth bleaching, makeup, colored contact lenses, etc. all modify the quality of facial parts. When quality is a dominant characteristic, whether positive (beautiful hair) or negative (skin acne), it will overwhelm the entire perception of the face and draw the viewer’s eye to it. For example, when beautiful hair exists, a mildly recessive chin often goes unnoticed. The viewer’s eye unconsciously is drawn to the beautiful, distracting hair, and the chin, therefore, goes unnoticed.

Position of parts is the next element of beauty. The spatial interrelationship of facial parts, including the forehead, orbital rims, cheekbones, subpupil cheek, nose, nasal base, lips, chin and throat length, constitute facial balance or harmony. Unless grossly out of balance (e.g., severe chin retrusion), the spatial relationship of parts does not dominate the perception of beauty. Parts balance is subjectively and generally unemotionally interpreted. Altering the position of facial parts involves more invasive types of procedures unlike quality: dental implants, orthodontics, rhinoplasty, orthognathic surgery, etc. Like facial quality, if the position of the part is a dominant characteristic, it will eclipse the other positive elements of the face. An example of this would be a severely deviated mandible — no matter the quality or position of the other parts, the eye is drawn to the chin deviation, and the remaining elements lose their influence on the overall perception of beauty.
The interplay of quality and position of parts greatly influences the clinician. As mentioned, when the face is unconsciously judged, the *dominant* feature (quality more so than position of parts) draws immediate and distracting attention. This might be a positive quality — beautiful eyes — or a negative quality — extreme chin recession. When there is a *dominant* positive or negative trait, attention is focused on that trait, and the other facial components go unnoticed. Often, outstanding quality leads to the perception of beauty even when facial balance is marginal. The clinician will unconsciously forgive mild chin retrusion or nasal base weakness if the patient possesses strong quality, such as full lips, smooth skin or brilliant eye color and form. However, facial imbalance, when severe, such as severe chin retrusion, distracts attention from positive facial quality. The gorgeous eyes are not noticed because the chin recession dominates the viewer’s attention. In general, the quality of facial parts automatically draws the attention of the clinician and is more important to the perception of beauty than the minor imbalance of facial parts position.

The clinician benefits from the dominant effect of facial quality. A patient who has severe parts position problems with unrecognized outstanding facial quality will have a more dramatic result. With the correction of the distracting parts imbalance, quality of the patient’s face is unmasked and can be seen without distraction. Because of this, the surgeon’s final result appears more remarkable. Many times after treatment, patients and those who are close to them notice for the first time just how vibrant the patient’s eyes really are. However, quality can adversely influence the treating doctor’s perception of the adequacy of treatment results for many of the same reasons. The influence of quality on the eye of the clinician can distract from minor position of parts problems and leave them untreated or unrecognized after final treatment has been achieved. Finally, if poor
quality existed prior to surgery and its improvement was not part of the overall treatment plan, the clinician’s efforts will not be as satisfying as they otherwise could be. Perfect facial balance will not appear as “beautiful” unless attractive facial quality is present. Quality of parts is what gives the emotional component necessary for extreme beauty.

Without some means of either masking quality or quantifying the exact position of parts, error and bias will influence the clinician at all levels of treatment. Unfortunately, contemporary surgery and orthodontics often do not produce optimal facial balance because facial part changes are subjectively planned and assessed rather than objectively measured. Without objective pre and post-surgical measurement of the interrelationship of facial parts, there will be a failure to recognize optimum facial balance. The face is not measured for multiple reasons. First, an accurate method of measuring the position of facial parts is not in widespread use. Second, clinical soft tissue measurement is difficult. Third, overjet correction rather than soft tissue balance remains the standard for most treatment planning.

In the past, a few soft tissue cephalometric analyses were developed to measure facial positions\textsuperscript{7-10}. These early soft tissue analyses were not combined with clinical assessment, and none of them examined all of the important facial components. Recently, facial balance, beauty diagnosis and treatment planning have been improved by means of a combination of clinical facial analysis\textsuperscript{11,12} and Soft Tissue Cephalometrics (STC)\textsuperscript{11,12}. STC ensures objectivity by directly measuring the relative position of all facial parts involved in treatment. It also provides normal values, emphasizes soft tissue outcome, removes the subjective influence of preexisting quality, and lessens the emphasis of overjet as the sole indication of success. Using STC focuses the diagnosis and result on

* Denotes financial interest
what orthodontics and surgery change — the interrelationship or balance of parts.

Beautiful quality, such as skin, hair, lips, etc., cannot obscure poor orthodontic or surgical
positioning of facial parts.

In summary, facial beauty is a combination of quality, position and balance of
parts. Balance and harmony are achieved in orthodontic and orthognathic treatment if
subjective bias is held in check by forcing objective assessment through Soft Tissue
Cephalometrics (STC). STC, in concert with close clinical facial examination, allows the
dentist to quantify and achieve reliable, repeatable and beautiful facial results.

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Image 1 Presurgical on left, post LFI, BSSO, chin, and cheekbones on right. No one can doubt the dramatic improvement. On the left, the viewer’s eye is immediately drawn to the dominant negative traits (excess incisor exposure, large interlabial gap and chin recession). On the right, the eye-catching quality is revealed once the dominant negative characteristics have been removed. The patient possesses beautiful quality (eye shape, color and skin tones), which is unmasked by the surgical correction of her dominant negative traits.
Image 2  Presurgical on left and post surgical on right. Note the distracting *dominant negative* traits on the left. Post surgery, the dominant negative characteristic has been corrected. The assessment of the postoperative result is a combination of position of parts and quality of parts — the patient looks very attractive.
The cephalometric tracing effectively removes the influence of quality from our assessment of the treatment result. The soft tissue cephalometric analysis (STCA) only reveals what the orthodontist and surgeon have produced with treatment and not the influences of makeup, eyes, etc. The STCA reveals a retruded mandible (blue -8, 3 standard deviations) and a full nasal base (green -10, 2 standard deviations). This result was produced with orthodontic lower incisor flare (red 54, greater than 3 standard deviations) and surgical steepening of the occlusal plane (red 102, greater than 3 standard deviations). The patient is improved, but could have had a superior result with correct placement of the parts by the orthodontist and surgeon.

**Image 3** The cephalometric tracing effectively removes the influence of quality from our assessment of the treatment result. The soft tissue cephalometric analysis (STCA) only reveals what the orthodontist and surgeon have produced with treatment and not the influences of makeup, eyes, etc. The STCA reveals a retruded mandible (blue -8, 3 standard deviations) and a full nasal base (green -10, 2 standard deviations). This result was produced with orthodontic lower incisor flare (red 54, greater than 3 standard deviations) and surgical steepening of the occlusal plane (red 102, greater than 3 standard deviations). The patient is improved, but could have had a superior result with correct placement of the parts by the orthodontist and surgeon.