
The geometrical rule of Perseo describes the existing geometrical/proportional human facial biotypes from the en-face view. Second Part

Abstract: this is the continuation of the relative First Part. Here the supermodels (representing the most spread ethnical looks in modern Fashion) are geometrically analysed. Through their faces, I have standardized human facial geometries, that is: transversal facial thirds, on the way to extend to the already clinically useful vertical facial thirds and sagittal facial thirds.

This is the first step in my “Logical Facial Anthropometrics” for a more complete facial analysis - coming in the next publications - since proportionally and morphologically features of single facial components must always be related to the global facial impression.

Why is facial geometry so important? By changing the frontal teeth form, the smile can be optimally improved only in the background of lips and rest of the face, although many operators do not care about that, since they identify the major “truth” in other aesthetic aspects, but not in a total facial evaluation, although simplified. It is in the background’s global face entity that you can find the aesthetic meaning of each single facial component. Because of such global implications related to even small modifications, it is now clear that even dentists and orthodontists should be acquainted with global facial Aesthetics, since mouth and jaws are definitely in the face.

My research about facial biotypes could also define and describe proportion-geometric relationships between face and teeth, since not enough Research and clinical application have been made in this direction.

The geometrical rule of Perseo: the geometrical quantification of existing specific human facial supernormal biotypes from the en-face view

From the en-face view, and referring to the my specific facial geometrical categories, we can identify two geometrical main groups:

1) the first one has been named the curvilinear geometry of the face (from type 001 to 004) and
2) the second one is represented from the squared geometry of the face (from type 005 to 015).
All large transversally faces, especially when curvilinear, can potentially be associable with the non-verbal message of “fat” face; in today’s fashion, you normally need at least a remarkable muscular relief on that visage, if you need to update that face referring to the contemporary aesthetical trends (that is, if you want to make that face “beautiful”). It follows an explanation of the proportional features of each single shape and a description of their facial outline, with particular reference to the anatomical structures, which are responsible for the geometrical variability itself. Every time when you think about the outline, you must notice that most of internal components rearrange their ratios in harmony to the outline, on the way to keep a positive facial aesthetical degree. Such kind of harmony will be deeper analysed in future publications, as we now concentrate on the standardization of the geometrical facial biotypes.

1. CURVILINEAR GEOMETRY OF THE FACE

(001) Elliptic facial shape:

This facial type has approximately its upper facial 1/3 at the bifrontal level so large/narrow as its lower 1/3 at the mandibular level. The curvilinear outline is regularly curvilinear at any level: frontal, zygomatic and gonial. Laterally, the zygoma arches may not be flattened (in that case we would have a rectangular shape) but are round and well expanded. Down in the face, we have an often clearly large, rounded and blunt chin, sometimes just slightly sharp (pointed). Facial elliptic shapes are often long faces: short faces with similar features are typically round facial shapes.

Please take a note!

*relative total facial height*  
*relative forehead width*  
*relative mandibular width*  

(002) Oval facial shape:

It could be considered as it would derive from the elliptic shape, if you let become the transversal mandibular diameter slender than the transversal forehead dimension. Obviously, the all outline shows a clear roundness, the zygoma arches may be flattened, although this is more typical for the trapezoidal-reverse shape. The gonial outline must be curvilinear and the chin is typically sharp (pointed). Modern “universal” beauty canons show transversal dimensions that fit narrow faces like oval faces. Under this conditions, have a look to the geometrical similarity between standards, the friendly alien face (which should represent the human evolution tendency in the million of years) and the baby face. This is the unconscious reason why oval faces/faces with predominant upper facial third have always be considered as interesting faces (this assumption probably bases both to non-verbal messages linked to human evolution, both to protective tender instinct for children appearance). Such “universal” models, describe slender shapes as the most beautiful, since most humans find in it the unconscious symbols of their human conditions. However, standards exclude all other possible geometrical combinations that we everyday see in our patients’ faces.
You could get this shape when you capsize the oval facial shape. In fact, here is the transversal diameter of the lower

North-europide female
i.phys. ( 134 %)
i.ft-zyg ( 98 %)
i.mand-zyg ( 73 %)

Mediterranide male
i.phys. ( 129 %)
i.ft-zyg ( 100 %)
i.mand-zyg ( 77 %)

South-mongolide female
i.phys. ( 121 %)
i.ft-zyg ( 95 %)
i.mand-zyg ( 77 %)

Dinaride-adriatic female
i.phys. ( 134 %)
i.ft-zyg ( 96 %)
i.mand-zyg ( 70 %)

Etiopide female
i.phys. ( 162 %)
i.ft-zyg ( 105 %)
i.mand-zyg ( 76 %)

Zambos negride female
i.phys. ( 156 %)
i.ft-zyg ( 100 %)
i.mand-zyg ( 75 %)

Bantuide male
i.phys. ( 145 %)
i.ft-zyg ( 81 %)
i.mand-zyg ( 94 %)

Etiopide female
i.phys. ( 161 %)
i.ft-zyg ( 82 %)
i.mand-zyg ( 86 %)

Mulato-europide male
i.phys. ( 154 %)
i.ft-zyg ( 85 %)
i.mand-zyg ( 98 %)
facial third broader than the upper third width. The whole outline is round, so that the zygoma arches are normally not flattened, the gonial points are curvilinear and the chin, often large, is never pointed, so that the whole lower facial 2/3 typically looks massive. This depends either because of abundant muscular mass at that level, or owing to a plenty of subcutaneous fat (typical beauty of the past, where fat was synonym of richness and prosperity). To its “drop-shape” impression, plays a role also a particularly slender and upwards-pointed forehead, as well as internal facial components, like considerable and rounded cheeks.

Like the elliptic shape, it has approximately its forehead width transversally similar to its mandibular 1/3. The zygoma arches are normally round and well expanded at both sides. The gonial points are curvilinear, so like the chin, typically round and wide. Vertically, round shapes are often short or middle faces. Long faces with such features are typically elliptic faces.

(004) Round facial shape:

This type, like the elliptic shape, has its upper facial 1/3 width at the forehead level so large/narrow as its lower 1/3 at the mandibular level. The squared outline has this feature mainly for three reasons: the zygoma arches are typically flattened and not laterally round and expanded (like in the elliptic, “drop” and round shapes), so that all three facial thirds are transversally of the same width. Secondly, the well-pointed gonial corners are of about 90 degrees and thirdly chin, like the zygoma arch, is flattened, so that G₀ and Gₙ tend to lie on the same horizontal.

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Pentagonal facial shape and
Ectagonal facial shape:

Due to the variability in transversal dimensions, the typical outline of pentagonal faces has three variants (Tr, Rect and TrR), which are not to be confused with the trapezoidal, rectangular and trapezoidal reverse facial shapes, since these last variants have not a downwards pointed chin like pentagonal faces have (this is the main differential feature). Typical features in all three variants are, in fact: zygoma arches laterally flattened, gonial corners laterally well marked and chin downwards very sharp (so that we have a mandibular triangle \( G_{01} - G_{10} - G_{0} \)).

As just said above, we do not have such downwards pointed chin feature in the other squared and curvilinear shapes, with just a few exceptions (respectively the rhomboidal and oval geometries). Note that, if the points Zy were laterally well pointed and projected, we would have the ectagonal facial shape (see also later). The name pentagonal was first used by anthropologists, but it must be told that the geometrically corrected pentagonal form is actually upturned (see relative figure), since the marked pick - the chin - looks downwards instead of upwards.

The scholastic pentagonal shape is our trapezoidal variant \( \text{Tr} \) (007), where \( G_{0} - G_{01} \) is larger than the forehead \( G_{1} - G_{1} \) (yellow lines).

If the transversal bigonial distance is slender than the forehead \( G_{1} - G_{1} \), we have the trapezoidal-reverse variant \( \text{TrR} \) (009; green lines). The last one is the rectangular variant \( \text{Rect} \) (008), where mandibular \( G_{0} - G_{01} \) is about so large/narrow as the forehead \( G_{1} - G_{1} \) (light blue lines).
I said above, that if the points Zy of the middle facial third, in a pentagonal basic shape, were very marked with projection, the sides $G_0 - G_1$ (red lines) would break into two more segments: $G_0$-Zy and Zy-$G_1$, so that we would have an ectagonal shape.

*(011) Rhomboidal facial shape:*
The rhomboidal facial shape has typically the upper 1/3 transversally very similar to lower facial third. Features are zygoma arches laterally well marked, so that the facial outline is squared and, consequently, different from the oval shape. Besides, a very sharp chin and the absence of laterally sharp gonial areas is a further typical feature. The rhomboidal shape, in fact, differs in this way from the pentagonal shape TrR. Note that a not very large mandibular width with any projected gonial areas increase the sensation of marked zygoma arches.

(012) Squared facial shape

(013) Hexagonal-short facial shape

This type, like the round shape, has its upper facial 1/3 width at the forehead level so large/narrow as its lower 1/3 at the mandibular level. The squared outline has laterally no projections, since the zygoma arches are flattened. The well-pointed gonial corners are of about 90 degrees from the en-face view and such perpendicular impression is increased by concomitant flattened chin, so that G₀ and Gₙ tend to lie on the same horizontal. We do not have, practically, any mandibular triangle G₀-Gₙ-Gₙ (like in pentagonal and octagonal shapes).

(014) Trapezoidal facial shape:

For this squared geometry, you have to imagine an isosceles trapezium, with G₀-G₁ and G₁-Gₙ as the parallel sides, where G₀-Gₙ (lower facial 1/3) is the larger side, i.e. wider than G₁-G₀ (upper facial 1/3). We have flattened points Zy (they may not look sharp also because of the concomitant large mandibular width with very marked gonial corners). It has no vertical projection of the chin downwards (lack of the mandibular triangle G₀-Gₙ-Gn). As already said above, a downwards projection would determine a pentagonal form Tr. G₀ tends to lie on the same horizontal of Gₙ.

Normally, as it should be a short face, from the profile we have a small mandibular angle (<116°, that is brachifacial). Just to bring some examples, a flat chin is to be typically found in rectangular squared, trapezoidal and trapezoidal-reverse facial shapes.

If the points Zy are laterally well projected, the side G₀-G₁ would break into two and generate the further segments G₀-Zy and Zy-Gₙ, so that we obtain an hexagonal-short facial shape. In fact, squared shapes are often short faces: long faces with such features are typically rectangular or hexagonal-long facial shapes.
In case of very slender forehead very upward projected, the trapezoidal shape would degenerate in a triangle shape (which base is on the lower 1/3). Such type of triangular geometry does not have the biological characteristics to result attractive in a human contest, since it would look flattened, but often less than in the trapezoidal shape.

You get this shape if you capsize the trapezoidal facial shape. The larger side is now the forehead and the lower jaw results slender than the upper 1/3. Such a slender mandible is not sharp downwards, so that the Gn tends to lie on the same horizontal of G0 (absence of the mandibular triangle G0-Gn-Gn). With such a triangle, we would have had the TrR variant of the pentagonal shape. The zygoma arches tend to be flattened, but often less than in the trapezoidal shape, where massive laterally projected gonial corners gave a bigger impression of Zygoma depression. If the lower jaw were projected downwards because of a vertically prominent chin and, at the same time, the transversal discrepancy between G1-G1 and G0-G0 were too big, the trapezoidal-reverse shape would degenerate in a triangle-reverse shape.

Some Remarks about the facial shape and the hair

Hair variety has been didactically described by anthropologist as an ethnical feature: today, we still have the unconscious perception of evolution in it, so that changing the colour, type and shape of hair has to be traced back to fashion styles looking for new exotic and geometrical compositions. It follows an example about the relationships between internal facial components and geometrical outline, A very transversally slender mouth would fit, today, better in external facial features.

with not enough forehead (forehead: non verbal message for "brain, intelligence") and with a relatively too much lower jaw (lower jaw: non verbal message for "instinct, animal aggressively, masculinity"). With a “normally” large forehead, the “aggressive” lower jaw remains aesthetical.

(015) Trapezoidal-reverse facial shape:

![Fig. 56 (Perseo)](image1)

![Fig. 57 (Perseo)](image2)

![Fig. 58 (Perseo)](image3)

![East-europide female](image4)
i.phys. ( 134 %)
i.ft-zyg ( 101 %)
i.mand-zyg ( 87 %)

![North-europide female](image5)
i.phys. ( 139 %)
i.ft-zyg ( 101 %)
i.mand-zyg ( 80 %)

![Arabo-orientalide female](image6)
i.phys. ( 131 %)
i.ft-zyg ( 103 %)
i.mand-zyg ( 83 %)

![015 Forma trapezoidal ribaltata](image7)

![Fig. 59 (Perseo)](image8)

![Fig. 60](image9)

(Milady, bibl. 21)

![Virtual Journal of Orthodontics](image10)

If you take the same individual pictures in standard head position, in the course of his/her life, you will probably notice that some environmental factors like the age, the state of nutrition, the tonicity of the musculature, the growth and degenerative developments of soft and hard tissues, influence the geometry of his/her face. In addition, the kind and volume of hair change the non-verbal messages of the facial geometry, since the hair is a decoration, which apparently modify the real shape of the face, similarly to make-up and cosmetics. This is the reason a certain cut or type of hair fit us better than another one. Note: we have seen some elements for a complete description of a face. As we will see together in future publications, each brain is genetically predetermined according to the genetic information of each single observer; it is influenced by circumstances during the life of the observer; each observer develops its subjective aesthetic taste. But there are many objectively describable elements, which we perceive in common with all other human animals, but these parameters are a lot and very complicated to be described. In my future publications about facial aesthetics, my aim is to identify them (most are non-verbal messages), so that a research protocol is listed in the next pages. I want to bring an example of the complexity of such Aesthetics aspects. The brain is able to get the impression of beauty by recognising balance (harmonic adjustment of directional lines). If you trace lines to identify the single anatomical facial component, you can see that the vertical line through the nose can be inclined to the vertical facial line, the teeth lines can partially or totally harmonise with these and other facial lines. All together, lines can have similar directions (harmony type 1), different directions (disharmony or line tension) or lines that contrary to other lines (harmony type 2). The Joan Miró’s Swallow/Love is a very suggesting example for line concepts in Arts, a factor that may not be forgotten by looking at a face.

RESULTS AND CONCLUSIONS:
the static beauty of the human face: a new global definition

Analysing facial beauty through pictures is the interpretation of static anatomical parameters. There are also dynamical parameters, as a face is obviously more complete to be evaluated with its mimic and physiological movements like the verbal language. However, since it is not necessary to appraise such dynamical aspects to conclude that an artistic work, like a statue or a portrait, is beautiful in the opinion of the general observer, aesthetical analyses of 2-D and 3-D pictures is useful for clinical application. Facial static beauty is a definition invented by the humanity to express as it follows. A face possesses some anatomical factors which, in “harmony” to each other, could potentially determine, in a wide percentage of observers and however on a genetically based “basic instinct” (variably influenced by culture), a positive or even a negative intellectual response, eventually concomitant to a certain degree of physical attraction/rejection. My geometrical standardisation is the base to fulfil the limits of current international universal canons and I am aware
that my effort is a progress, that tends to complete the description of static facial Beauty. This last is based on the interaction between two extremes: the general observer, who sees that face and the anatomical features of the face itself, which is observed.

The first extreme concerns all subjective observer’s esthetical opinions (**Facial beauty subjective factors**). The second extreme concerns the always describable objective facial anatomical features (**my 8 facial beauty objective factor**), that is not just the classical collection of harmonic facial ratios and symmetry,

1) Facial human traits (slight prominent orbital ridges, possible light bipostrusion, receding chin is very rarely, etc.), as demarcation between the humans and the “other” similar animals (Apes).

2) The ethnic-look, as differentiation feature between human “animals” in the evolution;

3) A sufficient degree of facial symmetry, that is implied in the first point;

4) Numerous classical combinations of facial harmony, linked to the multiple ratios and angles arrangements in the facial composition;

5) Geometrical proportional frontal features of the face according to Dottor Perseo (implied are some factors for the Radiant/Charismatic beaming facial beauty), in particular the proportional “geometrical frontal facial biotypes” due to the possible different kinds of harmony between internal facial components and the anatomical areas that delimit the facial outline; and the geometrical angular/proportional profile features of the face (“geometrical profile facial biotypes”). In each case, non-verbal messages related to the geometry can be recognized.

6) Anatomically confined static non-verbal messages according to Desmond Morris, related to each single morphological facial components’ mutual dimension (dominance in the face), position, morphological features and lines (components of the facial composition are: forehead, eyes, ears, nose and paranasal zones, zygoma bones and cheeks, mouth with lips and teeth, jaws, chin). Even anatomical components external to the face, like neck, hair and the rest of the body, positively/negatively integrate anatomically confined non-verbal facial messages. Besides, each sagittal facial modification, even if not quantifiably by frontal measures, can be non-verbally identified and therefore useful for clinical application.

7) “Comics” static non-verbal messages related to the whole facial composition, is to say the by us defined “Comics” facial expression. As mainly well-known in comics, caricatures, design Art and psychotherapy,

![Fig. 64 (Perseo): multiple facial ratios.](image)

![Fig. 65 (Perseo): a perfect example of a north-europide look octagonal facial biotype. Anatomical components involved in the outline reveal special non-verbal messages typical for such typology.](image)

8) Soft tissues traits like: skin's type-colour-light and contrasts; fold and lines due to bony-muscle relieves; but also to subcutaneous consistency and muscles tonicity.

![Fig. 66](image)

Please give attention to my seventh facial beauty objective factor: “comics” facial expression, since it communicates a variously interpretable (un)pleasant feelings to the general observer. Expression features are well known in comics and caricatures, so that this simple basic scheme can successfully represent some possible stylised “comics” non-verbal expressions of our human face (and apparently of our mood and even of our personality, like Physiognomics “scientifically” describes). I varied just two anatomical parameters: the inclination of the eyebrows and that of the mouth. We can immediately notice, that the flat mouth expresses, somehow, calm and tranquillity. With the mouth angles symmetrically upward: happiness, optimism. If downward: sadness, pessimism. If the mouth is wide open: amazement, astonishment. The states of mind represented in this
way, becomes more complex, if we add possible combinations through the eyebrows factor. The same face can be differently expressive, just according to simple positional and dimensional retouches of its components.

And such morphological arrangements become infinite in number, if you consider the global facial components’ interplay. Until now researchers has considered just this or that parameter. By concentrating on a special one, most of them believe to have found the truth in Aesthetics. But Aesthetics is all parameters together at the same time.

Facial components' interplay in different facial compositions of various biotypological kinds: Fig. 68 (Perseo), Fig. 69 (Perseo), Fig. 70 (Perseo), Fig. 71 (Perseo), Fig. 72 (Perseo), Fig. 73 (Perseo), Fig. 74 (Perseo), Fig. 75 (Perseo), Fig. 76 (Perseo)

The above-listed anatomical 8 facial beauty objective factors have to be considered relatively to each other and very dynamically, since they must be analysed by considering the changing of historical-social backgrounds and therefore, the different general observers type. In Aesthetics, after all, facial non-verbal signals are the facial global connotation, the idea that the same face expresses. It is not necessary that a non-verbal impression really corresponds to the actual personality of the observed person (main error of Physiognomics). Fiction is routine in our appearance, since we very often need to play an imaginary role to be socially accepted by the modern consume and image society.

And facial Beauty is like a Vip-card, while our appearance is our visit ticket. If we look "beautiful" like people perceive "beautiful" today, it is more probable that our general observers make the life easier to us, since judging the nature of the observed person just by his/her appearance is, unfortunately, a natural human instinctual attitude. Facial and body appearance is possibly one of the quickest ways to come to such conclusions and a dominant desire is being "beautiful", to all the costs. Therefore, supermodels to be analysed are not only scientifically useful for my project, but become an important testimony of an epoch and a culture.

Fig. 77 (Perseo): The above-listed anatomical 8 facial objective factors coexist together.

Fig. 78 (Perseo): supermodels also as an important testimony of an epoch and a culture.
BIBLIOGRAPHY:


