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The "Beauty" of Homo sapiens sapiens: standard canons, ethnical, geometrical and morphological facial biotypes. Publication 3. The geometrical rule of Perseo describes the existing geometrical/proportional human facial biotypes from the en-face view. First Part

(**Second part here**)

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Abstract: The international norms for "beautiful" europíde faces are ratios that result from long and expensive anthropometrical investigations. Operators can not actually take advantage of such relative numbers, since they represent appropriate guidelines only for some of their regularly observed patients' facial types, i.e. only for those patients, whose lower facial third is transversally slenderer than the upper and middle thirds. Many operators, however, refer very accurately to international norms, when planning therapies. International canons result, in fact, of very scrupulous research, that actually excludes, in aesthetic evaluations, most of other possible type of harmonies between the anatomical components and geometrical contour of human faces.
Therefore, I consider and describe other geometrical facial types representing the variable faces in humans. My geometrical or proportional classification of the various ideal human faces/Beauty facial types represents, in this way, the first research step to a new concept of Beauty as a solution for the limited contemporary facial Anthropometrics methods. At the University in Berlin I am charged, in occasion of my doctoral project, to develop the most complete Aesthetic analyse ever, so to find out new appropriate universal norms for all ethnical facial types of modern fashion. The today supermodels' facial features are definitely a suitable and reliable reference-ideal for the very changeable facial types of our patients.

Introduction: In my Publication 1 and 2, divided in 5 parts (1), europíde norms from en-face pictures have been collected and - through visual methods - conceptually criticized. Current standard canons for europíde faces are specifically suitable only for north-europíde and/or the mediterraníde ethnical-look (ethnical limits of anthropometrics). Furthermore and unfortunately, the research in facial Anthropometrics selects "attractive" people with oval-shaped faces, excluding those with other facial forms (geometrical limits of anthropometrics). Our modern Beauty canons for europíde visages have been represented since the Greek times: they were and are still representing oval-shaped faces or, however, faces with lower facial third slender than the forehead. In addition, Beautiful faces, ethnically, have and had to show the dominant society ethnical look. Consequently, international norms do not refer a big variety of ethnical looks, since they should be not a symbol for modern beauty. Please tell that to our patients around the world! Aesthetics cannot be so simple, if we need good standards, diagnostically and therapeutically (2) reliable.

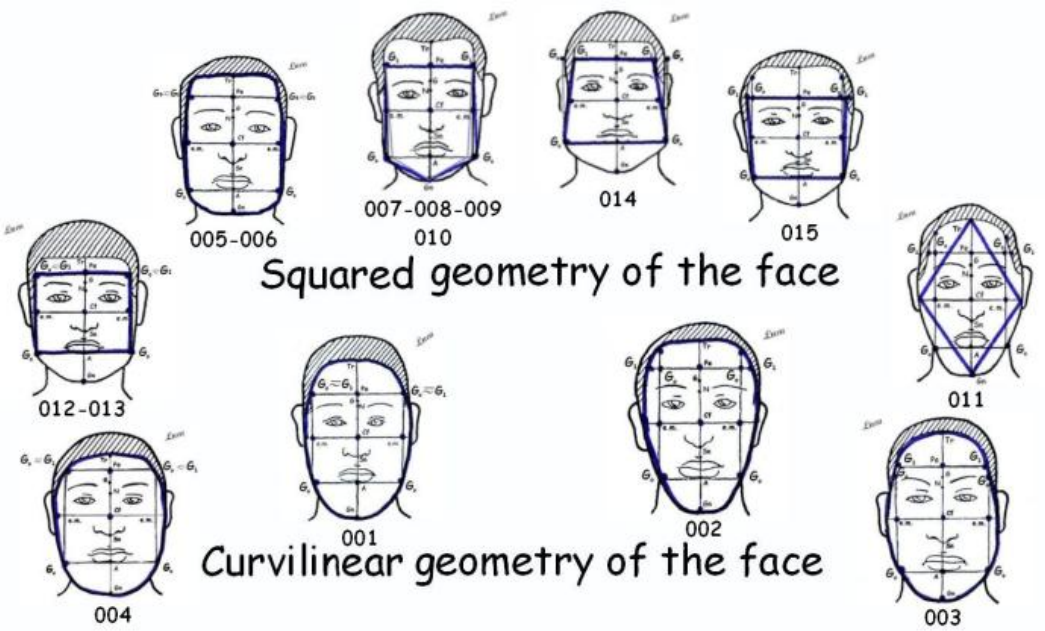


FIGURE 1: the possible facial geometries

ETHNICAL LIMITS OF ANTHROPOMETRICS

The first imperfection of the standard universal facial canons is the very superficial attention given to ethnical features. That is to say, that the anthropological research intended to describe the facial features of the existent ethnical looks has still not found any valid clinical utility but only a reach background to racist ideologies. The face of Homo sapiens sapiens (living Homo sapiens) inevitably shows, however, different ethnical phenotypes (ethnical appearances) and which each one of us can be aesthetically related to them.

Interesting is that, normally, we individual humans look different from each other (individual variability) and not all ethnical populations (ethnical variability) look the same. Anthropologists described such ethnical variability in terms of “races”; I say ethnical look instead of “race”. There are various types of ethnical and proportional harmony, to which refer each individual. Moreover, in each ethnical group, everyone has precise features, so that he/she looks different from all others. Genotypic and phenotypic Politypism has been the biological-evolutionistic key to the survival through evolution of the human species before. Today the phenotypic Politypism is the evolutionistic key, since "phenotypic (= appearance) individual variability" has become the new selective (i.e., genetically mortal) natural factor of modern societies. Here follows a specifically ethnical example, that suggests the evolutionistic importance of ethnic variability: if human ethnical groups would have had a very identical genotype and physical appearance, the same selective mortal natural event would have already and rapidly brought all humans to extinction, since nobody could differently react and survive. Since traditions and history exist, that is since not many thousand years, ethnical crossing has been the essential factor in producing and developing genetic and physical ethnical variability. Even in the pre-history it played a very important role. Evolutionary, 150.000 years represent a not sufficient long time to cause particular effective ethnical differentiation from the same human species (first Homo sapiens sapiens from Africa) that travelled through the continents. Ethnical promiscuity is still increasing in the all planet, and so in the coming centuries, since technological transports have shortened the distances between the continents. The "didactic ethnical looks" of Anthropology (mediterranídi, nordídi, etiopídi, etc), depending on economical and social factors, has been enlarging in the from me described "new ethnical looks" - that come from mutual crossing of the original groups (Mulatos, meticcio, Zàmbos, etc) - while other typologies have practically come to extinction (Australídi, amazzonídi, etc). This comes from the "biological" success that today pilots the present evolutionary inclination. Not more a natural but a cultural selection, due to modern progress of some and regression of other populations, although - in the third world - some poor populations have not any control of new born, so that they increase in number in any case. Taboos in talking about ethnical subjects have certainly contributed, even between specialists, to underestimate the importance of training in recognizing racial features, so basilar and important in matter of Aesthetics.

Why do too simplistic standardised norms still find success in the Clinics? Are not they ethnically - and geometrically - limited? There could be many reasons for that. Here are some motives for the typical ethnical - and geometrical - inadequate culture. Such lack of knowledge provokes a public profound dissatisfaction for universal canons, so that I am going to enlarge them. The first motive is the modern inclination to offer relatively “few” simple canonical standards, together with systematic errors due to the universality of standards, (almost equal for all human faces types) and possible systematic errors in the choice of such ethnical and geometrical standard used to represent but all human faces. Such inclination depends on modern consumistic economical mentality: the desire to buy or find correct all things or theories that are ready and easy to be used, even at cost of deepest simplification. The second motive is: universal beauty research appears more interesting and “correct” if supported from the typical statistical models used for scientific and computerised targets. The third reason is connected to the first modern motive: many operators confide too much in (standard) ratios and angles. These are the basilar element, that is true, but are never the only

aspect considered, in Aesthetics and cephalometrics. They very often considered norms as the only aspect of Aesthetics. Other operators, however, soon experienced their unreliability, when used as the only aesthetic criteria. Such modern simplistic approach is not new in the human culture, since mono-ethnical and mono-geometrical attitudes proliferate since history and arts exist (3,4). All greater artists have created their works by proposing the same universal Beauty canons, since they basically concentrated on the representation of very few facial shapes and on the idealisation of their own ethnical look or, eventually, of the socially, culturally and economical world dominant population. The last point is particular relevant today through mass media. It is not rare that patients originally mongolíde or negríde would like to get American-europíde ethnical features and such is done from maxillofacial facial surgeons.

Do all patient desire to get other ethnical and geometrical features? Or should we be able to propose also other facial models, if they look more appropriate to the facial typology of each single patient who desires to keep his biological identity? We need to standardize some more canons. The valorisation of ethnical and shape human variability are therefore my aim. If some patients desire to change their ethnical and geometrical features, this is not the problem of my ethical diagnostics and therapy, since I repair faces, but I do not change them. Also in clear Orthodontics, Prosthesis and General Dentistry, where Aesthetics goals are not rarely very restricted, a better comprehension of the features for human facial variability is the best cultural background to the best diagnosis and to the enlargement of therapeutic choices updated through the non-verbal messages of contemporary most successful fashion facial features.

The “Hollywood” current causes the development of the most applauded fascination for the public taste. Mostly Hollywood’s top-models represent the appearance of the dominant society. Variability in ethnical features satisfies the public taste, since it represents the all other “beautiful” and exotic ethnical facial human types living in the dominant societies (North-America, Europe and some parts of Asia).

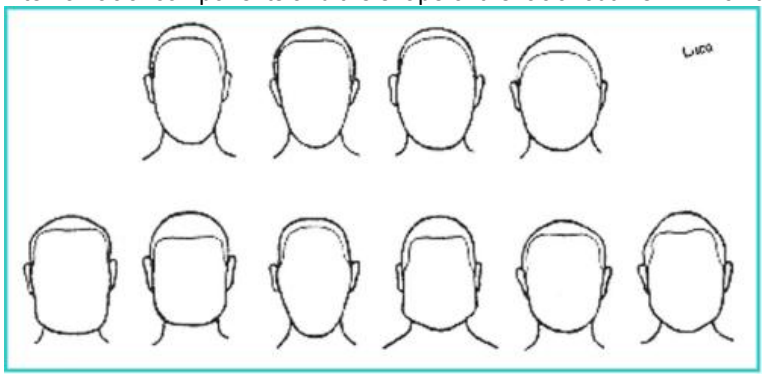
GEOMETRICAL LIMITS OF ANTHROPOMETRICS

FIGURE 4: the internal anatomical components remain the same, while the facial geometry transmutes. Left: trapezoidal geometry; middle: elliptic geometry; right: oval geometry. The aesthetic appearance has changed, because of the different outline.

When you analyse a face, please notice first its ethnical look, as both soft and hard-tissues parameters contribute to give you a non-verbal impression of ethnicity. Secondly, it is useful to relate each face to a certain geometrical shape, when you look at it from frontal pictures in standard position of the head (I use the Frankfurt horizontal). With a minimal experience, you will not need to draw my proposed geometrical net anymore. Distinguishing the facial shape is a rapid clinical artifice on the way to choose the most reliable reference ideal facial canons for each single face; and to allow an easier evaluation of the non-verbal facial messages. The "best" reference ideal ratios for facial beauty do not depend on statistical methods. In other words, if you need to describe a single beautiful face, you must not measure a sample of more than 100 similar faces, because their “statistical average” or “normal values” cannot be better than the ratios of that same single face to be described. We do not know if statistical values would really correspond to a so beautiful face than the real one (it can also happen, like I showed you with the critic to standard beauty canons; but it is not always true). And if statistical norms describe “beauty”, do not statistical norms represent the same geometrical

template for just one type of beauty? Our universal norms cannot be universal, because they can not describe all facial types (universal), but just the single statistical type. The always-real evident beauty is, to me, the single top-model face and certainly not such statistical tedious and pseudo-scientific extrapolations from many faces considered together. Aesthetics is, in fact, not a disease or a biological entity that reacts to drugs. Statistical methods are reliable in Medicine. However, statistical procedures are the method that most authors and editors think should be the only right one to describe ideal faces. They prefer to trust a “virtual” collection of statistical canons and are even more enthusiast, if they find the way to proof them visually by using computerised 2D and 3D images or even masques (templates) for direct comparison with the patient’s face. A Template exists since norms correspond to geometrically/proportionally well-defined masques to superimpose. Universal norms obtained through statistics represent nothing universal in matter of beauty, rather only a single geometrical statistical biotype, with the exclusion of all others typologies. This is the biggest limit of universal canons but also represent the starting point to my biotype concepts. I studied, therefore, such universal norms very critically (see my publication 1&2, for example). We need more biotypes and each top-model of a certain biotype is a guarantee of the reliability of his/her facial ratios as model for all humans of that facial biotype. And that is what I am doing alone, against the researchers tendency to still look for a virtual masque or similar. Can be such virtual masques always beautiful? You already know the answer. Would it not be easier to create a masque from an existent top-model face, on the way to describe their geometrical features and, approximately, also some aspects of their ethnical look? Such new ideal information could be compared, by direct superimposing, with the faces of all patients of similar facial type. Please standardize, in this simple non-statistic way, all human facial biotypes by searching ideals from fashion. Fashion create the world public aesthetical taste. You got the answer: fashion is reliability in Aesthetics. And this is the aim, although I am sometimes unmotivated from critics like: in your publication you did not give enough literature references or you did not used a valid statistical method in describing standards. My replies are: where is the literature about valid descriptions all facial types for my and your patients? How can I propose to my patients the standard virtual ideals obtained scientifically through the scientific methods? In measuring a patient or top-model facial ratios, and in cephalometrics as well, you should better care of statistics only in the measure of considering a standard deviation of ± 1 as range for optimal proportion indices (5). In this case statistic is important, since the operator can commit light failures in measuring. That is all. My innovative refutation of statistical amalgamation and preference for analysis of only one face on the way to get the right description of its own facial type is not a method to be used to find cephalometric standards. My ideas about Aesthetics would be true also in cephalometrics if we could have skeletal top-models, i.e. skulls famous for their beauty. This is an absurdity. Analysing lateral skull radiographies of today’s famous top-models could be incomplete, because we have no evidence and guaranties that the soft tissues thickness and quality is comparable between the analysed ideal top-models to refer to and the single patients, also if they have the same ethnical and proportional facial type. Present cephalometrics norms are, therefore and for other reasons, a useful standard to be considered with very carefully attention on Aesthetics. Actual cephalometric norms must not be the only target of our functional therapies, if you can choose between different functional correct decisions and get, through your choice, a result which is aesthetically nearer to the proper beautiful ideal for that patient’s facial biotype. By using the faces of supermodels, I am going to standardise the aesthetic ideal.

Today's reference ideal ratios for facial beauty are insistently "proposed" to our patients through mass media, which persuasive power very strongly conditions the esthetical public/mass taste (6). Analysing the head of today's fashion top-models through ethnical and geometrical criteria, we can evaluate what the public considers as beautiful and attractive. The anatomical components external to the face that integrate positively and/or negatively the non-verbal facial messages are the hair and the rest of the body. The anatomical components internal to the face create and are contained in the upper, lower and middle facial thirds. Such components are obviously the forehead, the eyes, the ears, the nose and paranasal zones, the zygoma bones and cheeks, the complex mouth-lips-teeth, the jaws and the chin. Finally, external to the face but very correlated to it is the neck. The contour of the face has always a precise shape and only a few of the internal components influence the shape directly. The geometrical analysis is, therefore, a useful instrument to recognise the kind of proportional harmony (and non-verbal messages) existing between the internal facial components and the shape of the facial outline in which they are contained.



My geometrical rule of Perseo is intended to promote the single patient starting facial biotype by referring it to its optimal ethnical and geometrical esthetical ideal (ideal basic biotype) and so much as possible conforming to the patient aesthetical taste (his/her satisfaction must be important for the operator’s choices). I think it is more ethical, if we restore a face instead of changing its basic features. This is always important, in facial surgery but also in orthodontics and dentistry (if the therapeutic impact here can be modest, the diagnostic role is always relevant).

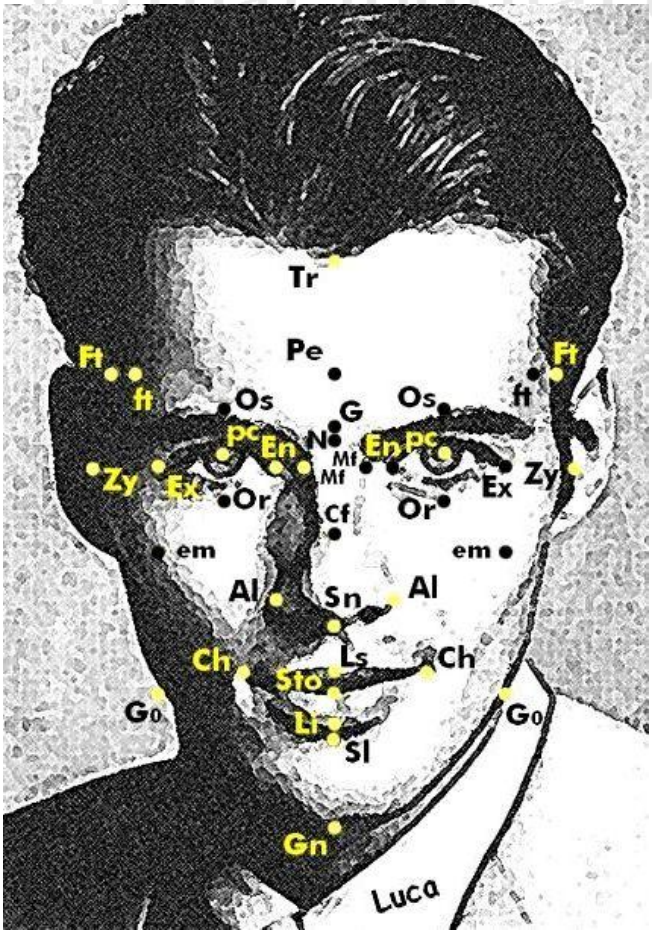
The geometrical rule of Perseo bases on the Pöch’s (7) face’s geometrical description (1916) for the Homo sapiens sapiens).

FIGURE 5: an example of the outline alone, due to the limits of some internal facial components.

Remarks: during the adult age, facial soft and hard tissues undergo into proportional and qualitative modifications, influencing consequently the degree of Aesthetics. This is clear both from the internal anatomical components and from the starting geometric shape, since the outline is determined from the same facial anatomical structures. However, for several years, narrow faces remain narrow, large faces remains large and middle faces remain middle. But a narrow face could become larger, for example, if the cheeks fatten up.
In matter of Aesthetics, some operators are more able than others are and a few will always be the best. But all other competent operators in functional problems have, however, a great responsibility also in the appearance aspects. Aesthetic goals satisfaction is consequent to a natural artistic talent, but also to tricks learned by the own personal aesthetical training. By describing first the facial ethnical-geometrical fundamentals, I finally put a theoretical postulate for the Clinics, since lack of competence in Aesthetics has negative consequences for the single patients and positive for their legal representative.
Literature research mainly concentrates on the so-called (supercategories of) mongolídi, europídi and negrídi, which are, unfortunately, only a too general virtual simplification, in view of the fact that they academically approximate the human multi typologies. Only for very academic disquisition, we can still refer to the ethnic supercategories. And such generalization in negríde, mongolíde and europíde appearance is a useful example of three types of the archaic and modern man adaptation to three different selective climatic conditions. The europíde, approximately, represents a certain number of ethnic looks that are specialized in surviving in moderate climates. The mongolídi are better indicated for very cold climates. The negrídi are for very warm climates. In addition, factors as the humidity and the drought play a fundamental important role in the process of ethnical differentiation. However, each supercategory is described by standards in Aesthetics and cephalometrics, since they are a statistical combination between about 10 ethnical looks ("races"). The ratios for the Arabian faces, on the other hand, do not fit the typical proportional features of nord-european faces. And this is true for all similar ethnic looks. Consequently, statistical compromises cannot describe the "normal or standard" ratios for beauty. Actual standards, therefore, do not offer suitable ratios for each category of patients, which I am going, on the other hand, to describe. Researchers defend the correctness of their studies, since they supplied statistical methods. But if such negríde standards ratios, for example, fit very well the etiopíde and sudaníde somatic features, since even more than 2/3 of the black world population has bantuíde ethnical look, most black patients will let unconsciously alter some of their facial proportions according to etiopíde and sudaníde norms!. Most operators, by treating bantuídi patients, can potentially refer to somatic etiopíde and sudaníde features, which instead evolved in Africa at more than 4000 Km further north from the lands of ethnical differentiation for bantuídi. Such is the risk for about 40 millions of " negrídi" living in North America who decide to undergo orthodontic maxillofacial or dental treatment. The same is true for europíde: in Europe, the face for the standard mediterraníde with a certain shape shows different features from the esteuropíde type, even if the facial shape is the same. Since the face of Homo sapiens sapiens has many geometrical-racial combinations, let me tell you once again that variability means evolutionistic advantage. A clear esthetical training will bring to consciousness all non-verbal messages that we get instinctively when we observe someone's face. In different grade, from individual to individual, our eye distinguishes easily, and with minor error, even differences of few millimetres. At the same time, we compare the observed face, first unconsciously = non-verbal impression, to our personal aesthetical ideals and to our personal identification schemes [8,9,10,11,12,13]. But describing a face properly can be difficult to be done, if you do not know the elements to observe it. Our assumptions like: "I do not like that face", other: "In this photo I find her/his face nicer"; or "his/her face has an exotic charisma, but I do not know exactly why"…"maybe because of the eyes", etc., are an example of esthetical judgments. Such considerations are just personal opinion of micro-dimensional evaluations of the whole face. And they will be integrated to type, colour, tonicity and minimal contrasts of the skin existing between the single anatomical parts vii , dimensionally illustrate through ratios and geometry. The artistically perfect ideal beauty concept must have a clear human appearance (and not that of other animals) and cultural and individual factors influence it, in the sense that they offer always new interpretations for the various non-verbal messages linked to an observed face.

Materials and Methods:I selected the most beautiful pictures of the most beautiful top-models from all over the world. The photos have been first drawn, and then digitalized. A special net of three horizontal and three vertical lines has been drawn over each face, offering a structure for an individualised geometrical method. It offers a visual method for the transversal comparison of the classical three facial vertical thirds Tr-G, G-Sn, Sn-Gn.
The geometrical anthropological intuitions have been confirmed by observing them in such en-face portraits and will be illustrated in the following pages and described through the geometrical rule of Perseo. The rule refers to the proportional confrontation between the forehead and the mandibular width, while the unity of measure (100%) is the zygoma width. In other words, the rule of Perseo describes, through a relative facial net for the identification of the facial shape, the facial thirds transversally. These new information will be correlated to the classical vertical ones.
Here down follow the important anatomical and anthropometrical lines and points for the aesthetical analysis and for the construction of the net. Most of them have been used in my past publications and a few of them are new and explained now.

ANTHROPOMETRIC LANDMARKS IN FIGURE 6: (FROM EPKER [16])

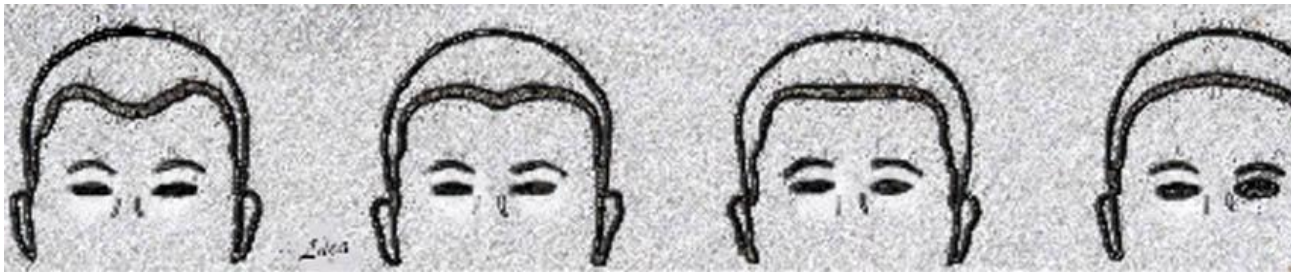


A: intersection between the line G0 - G0 and the lower lip Sto-Sl.
Al: alare
Cf : Center face, conventional but not anatomical point, variable in position, traced along the sagittal facial line, at the vertical half between N and Sn (N-Sn is the nose high). It is useful for the construction of Pe and for the approximate identification of e.m, when you trace an horizontal line passing for it and a vertical line per G0;
Ch: cheilion
em: malare eminence or cheek-bone
En: endocanthion o internal canthion
Ex: exocanthion or external canthion
Ft: classical anthropometrical frontotemporale, that is narrower than the actual visible forehead.
G1: intersection between the bifrontal line of Perseo and the hair lateral lines.
G1- G1: actual frontotemporale or bifrontal line of Perseo, that is the actual visible forehead width found through the Perseo Facial net It is the upper face width.
(abbreviation: i.ft-zyg, that is: index frontal-zygoma)
G0: gonion from gr. “angle”, positioned over the mandibular angle. It is found by drawing the horizontal line passing though the lower lip Sto-Sl and the mandibular facial contour.
G: glabella
Gn: gnathion
Li: labiale inferius.
Ls: labiale superius
Mf: maxillofrontale
N: nasion
Or: orbitale
Os: orbitale superius
pc: pupilla centrum
Pe: Perseo point Pe: conventional but not anatomical point, variable in position, and used in my facial net. However, it must be vertically positioned at the facial midline at the distance Cf-Sto, so that Cf-Sto = Cf-Pe.
Sl: sublabiale
Sn: subnasale or subnasion
Sto: stomion
Tr: trichion
Zy: zygion
Zy-Zy: middle face width

G0 - G0: approximate mandibular width or lower face width. It intersects the lower lip in the point (Abbr: i.mand-zyg)

Discussion: The facial borders are going to be defined, since each facial geometry depends on the relative representation of its outline. The lower facial limits are defined from the chin, which continues in the mandibular inferior (cervical-cefalic) line and passes, at the level of the gonial areas G0, into the cheeks’ external contour.
The upper facial limits are differently defined from various authors, since some do not include the forehead in the face, as the forehead is part of the neurocranium. In my opinion, nobody’s face can be properly described without vertical considerations about the forehead, so that the considered facial high will be always the physiognomic facial high Tr-Gn, that is the vertical distance from the median hair line to the median lower part of the chin.

FIGURE 7: Kinds of hair lines



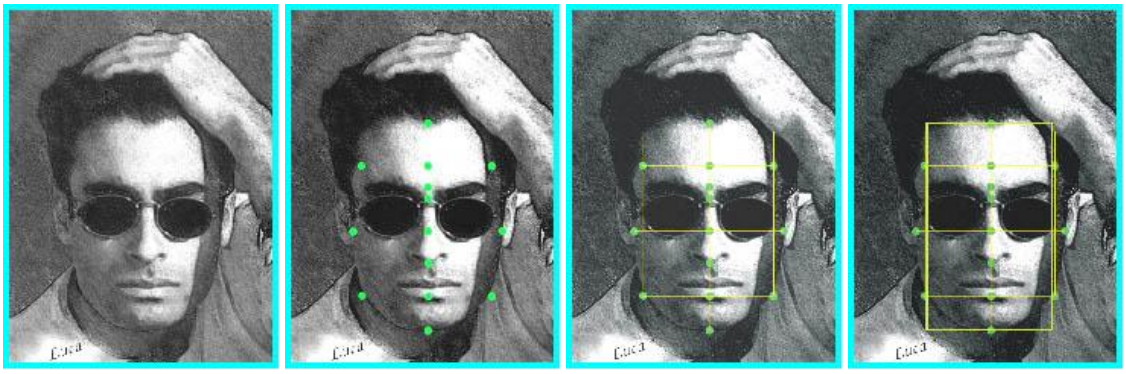
As already said, for some authors it is enough to consider the morphological height of the face (splanchnocranium), that is the G-Gn. Since I believe that the en-facial shape is a very important factor in Aesthetics, you always need to consider also the actual visible forehead in the evaluation of a face. Geometry is the transversal evaluation of the face, to be later integrated also with vertical features. Also transversally we have different opinions. Some researchers do consider the forehead not properly, since they think that the forehead width is Ft-Ft. I consider it as G1- G1, that is the

actual visible forehead. On the other hand, the most lateral facial points are the Zygions (Zy-Zy marks the maximal relative width of the face). And the most lateral points of the lower jaw are the points G0. The forehead can be large, middle or slender. The zygoma arches pointed, flat or rounded, so that the relative facial high and largeness are affected. Also the lower jaw can be large, middle or slender. The possible transversal combinations generate and describe the different facial geometrical types. Historically, Blumenbach and Sergi must be remembered. This last, studying the face from the geometric aspects (16), did not give us exact indications on the standard orientation of the face in the frontal norm and did not distinguish all the possible geometric forms. Not even my virtual teacher Pöch, sixteen years later, who suggested all the possible types of basic geometry to which you would be been able to bring back every pleasant human face, was able to give indications on the facial standard orientation, so that any of such geometries could be reliable in clinical analysis. We must still wait 13 years, until 1929, with Frassetto (17), who standardized the head position for clinical studies.

FUNDAMENTAL FACIAL SHAPES ACCORDING TO PÖCH-PERSEO

Specific geometrical categories
01 Elliptic
02 Oval
03 Oval-reverse
04 Round
05 Rectangular
06 Hexagonal-long
07 Pentagonal (Tr)
08 Pentagonal (Rect)
09 Pentagonal (TrR)
10 Ectagonal
11 Rhomboidal
12 Squared
13 Hexagonal-short
14 Trapezoidal
15 Trapezoidal-reverse

In each ethnical look (not supercategory), for each geometrical shape I reported you a code showed in the table here besides.
Please observe that the pentagonal facial shape has 3 variants, each one is considered as an independent geometry. They are the Tr (Trapezoidal variant), TrR (Trapezoidal-reverse variant) and Rect (Rectangular variant).
For each one or more photo-models of clear ethnical look, a geometrical type is defined. All 15 facial specific geometrical categories are practically present and well distributed in almost all ethnical appearances. Some shapes are more frequently represented than others, since anatomic parts or groups of parts (the jaws, the middle facial third and so on), are quantitatively and qualitatively represented and they are linked to racial features = different anatomy and functions selected through evolution. For example, large faces are more typical for some negríde and mongolíde ethnical looks, where they are particularly endemic. Regarding to the ethnical appearance, we cannot do anything to simplify it. But geometrically, while the 15 specific categories give us detailed information about the anatomical organisation of the single part of the facial outline, a such big number represents a very big limit as well. A solution to this point is identifying the facial shapes in a generic and simpler subdivision: the not-specific categories. The universal canons for beauty described only the first not-specific category (that has only 3 of 15 possible existing facial geometries), while the other two geometrical facial types do not find any place in the international literature (these represent 12 of 15 possibilities).



Not-specific geometrical categories

1) Narrow faces
2) Transversally middle faces
3) Large faces

FIGURE 8: The construction of the Perseo facial net. The distance Cf-Pe = Cf-Sto. The horizontal passing per A will define the points G0. The horizontal passing through Pe will define the points G1. The horizontal passing per Cf can define the points Zy, but this is not a rule.

Transversally, evolutionary and individual factors determine the three just mentioned facial not-specific geometrical categories:
1) **Narrow faces**: these faces have a lower facial third slender than the upper facial third (shapes 002, 009, 015) (they coincide with the UNIVERSAL BEAUTY CANONS);
2) **Transversally middle faces**: these faces have the lower facial third so large/narrow as the upper one (shapes 001, 004, 005, 006, 008, 010, 011, 012, 013)
3) **Large faces**: these faces have a lower facial third larger than the upper facial third (shapes 003, 007, 014).
Like you find out in my papers, the not-specific categories 2) and 3) exist, since they determine the facial variability and

are important, in matter of objective describable beauty, like the standards universal canons and, maybe, even more. They represent, in fact, a major part of possible patients.
This is the first time, in literature, that you consider the facial thirds not only vertically or sagittal, but also transversally. From the en-face picture, the integration of vertical and transversal information, in the aesthetical diagnosis, must also refer to other combined factors like: the relationships between of teeth form and the facial shape (18), cephalometrics, cast analysis and so on. Depending on the vertical entity, that is on a percentage value Tr-Gn/Zy-Zy (%), called physiognomic index (i.phys.), each not-specific transversal category (and consequently the all 15 specific geometrical categories), can be vertically defined in three possible variants:
- **Long faces** (leptoprosop or dolicofacial face), where the i.phys. is bigger than 131% in men and 137% in women;
- **Vertically middle faces** (mesoprosop or mesofacial face), i.phys.: between 111 and 130.9% in men; between 111 and 136,9% in women;
- **Short faces** (euriprosop or brachifacial face), i.phys.: between 100 and 110,9% (sometimes even less).
Every single facial proportion depends on the other ones. For example: it makes sense saying that the face is large, transversally middle or even narrow, only if it is with regards to its high. On the contrary, the face is long, vertically middle or short in relation to its width. For the same reason, each facial proportion depends on all other facial ones, so that also the factor geometry is fundamental and has to be considered.
Obviously, the rectangular shape and its hexagonal-long variant is, generally, because of its definition, a long face. On the other hand, the short shapes like the squared geometry and its hexagonal-short variant are generally short and not middle or long. Exceptions are possible.

"RULE" OF ETHNICAL DISTRIBUTION OF THE FACIAL PHYSIOGNOMIC INDEX AND THE "RULE" OF ITS HARMONY WITH THE NEUROCRANIUM…

The physiognomic index, as you already know, is the relationship between the facial physiognomic height Tr-Gn and the middle face width Zy-Zy, and its value depends on a certain ethnic variability. The narrow and long faces are endemic among the europídi, so that the i.phys. is here around 130-136% and more, that means that the Tr-Gn is about 1,3 longer than the width Zy-Zy. We can frequently have deviations from this "rule". Short and wide faces are endemic in the negrídi and in the mongolídi. Also here we can have very frequently deviations from this "rule" (i.phys., often smaller than 110,9% but even bigger than 136%). Generally, we can say that the pavement of the neurocranium is the base on which the maxillofacial facial skeleton articulates; and the maxillofacial skeleton is the base in which the soft tissues find support. Another "rule" about such anatomical structures is given by the frequent harmony existing between the skeletal face and neuro-skull. However, the soft tissues' variability is ethnically so strong, that such already existing underlying harmony between the bony components - influenced by evolutionistic and individual factors – could not found at the soft tissues. Nonetheless, it is not rare that long and narrow faces are post-anteriorly harmonized with their skulls, which are relatively sagittal long and even vertically tall in comparison to their own width (dolichocephalic) (19). Facially, subjects with open bite have increased maxillary and mandibular dentoalveolar heights, a larger gonial angle and a narrower and longer mandibular symphysis. Conversely, subjects with deep bite have opposite characteristics (1). And it is not rare that their frequently short and wide faces are post-anteriorly harmonized with their skulls, which are sagittal and even vertically relatively short in comparison to their own width (brachicephalic) (21). In this way, anthropologists showed a frequent existing correlation among the zygoma and parietal diameters so that - for matters of ethnical and individual growth (22) the wide skull associates to wide maxillofacial structure and vice versa. Remarks: like transversally, we can have ethnical look variability also vertically (i.phys.). However, in each racial appearance, only one of the three vertical variants is generally endemic, with some exceptions. Nevertheless, for each vertical facial variant, we find many ethnical typologies, so that in each ethnical look, finally, we can describe almost all possible facial shapes and each shape can be found in almost all ethnical looks. Such are simple anthropologic observations, which did not find clinical utility, until today. Interesting is to observe that the facial physiognomic high Tr-Gn and its middle third width Zy-Zy have been demonstrated - through correlation coefficients between parents/children - to be hereditary features (23). In someway, connected to hereditary transmission are also many other facial ratios, so that the facial high is correlated to the head and nasal length, while the facial width to the head and nasal width. This is particular clear also on the skull bone structure.

…AND DEVIATIONS FROM THE RULES

Mesoprosopic or mesofacial faces are much spread in humans around the world (24) . It is neither a long nor a short face, when referring to its own width. It can result from individual factors; or from the phylogenetic adaptation to moderate climates; or from the mixture between populations with typical long faces with others of characteristic short faces. In fact, referring to the last point, both the archaic humans, examples for hominids (Homo erectus ed Homo sapiens and others) and the modern humans (Homo sapiens sapiens) could have been in biological contact with each other. Archaic forms of humans in the world, with well-defined racial features, ethnically differentiated in a much long period, larger than 1,5 million years (for example, Homo erectus of Pecking for mongolídi and Homo erectus of Java in Indonesia (25) for europídi (26)); before extinction, by mixing with modern humans (i.e. the Homo sapiens sapiens from Africa that, like the Homo erectus had done more than 1.5 million years before, travelled through the continents), they probably provided, to modern now living humans, their already selected and differentiated ethnical features. In fact, modern humans have been existed only from about 150.000-200.000 years, that is evolutionary a too short period to

justify the ethnically so clearly differentiated today human faces. Some European populations from the Middle East (armenídi-assiroídi and some others), usually deviate from harmonic relations described above, so that a dimensional disharmony between the brachicephalic neurocranium (post-anteriorly short and/or transversally wide) and the leptoprosopic or dolicofacial face (vertically long and/or transversally slender) is endemically frequent in such ethnical looks. Such long and slender faces (dolicofacial faces can be evolutionistic interpreted as a recent type for the desert) do not associate to the typical archaic negríde skull structure (dolicocephalic), properly selected for tropical and wet environments.
Another disharmony is to be found in some ethnic looks (ex. australídi), in which euriprosopic or brachifacial face (vertically short and/or transversally wide) are concomitant to a dolichocephalic skull (post-anteriorly long and/or transversally short). And such short and wide face (brachifacial face) is evolutionistic to be interpreted as the persistence of an archaic facial type - especially if associated to other primitive facial features like prominent orbital zones and very large nose - selected particularly by dampness of tropical zones and, in a certain degree, also in the moderate climates, if they are humid zones (like near to the sea). The short and/or wide face is still to be found in many negrídi groups or among the aboriginal australídi and, in the past, in varied groups of hominids, as it happened for the Homo sapiens sapiens of Cro-Magnon, with typical dolichocephalism, The climatic dry conditions in which australídi live nowadays are certainly very different from the evolutionary conditions of humidity necessary for the persistence of their facial features.
In conclusion, the physiognomic index is a very interesting and important ratio but, taken alone without other reference ratios, it is not reliable and has to be considered very careful. This is obviously true for any single facial ratio when taken alone. What we need is always a global vision: i.e. just a few facial ratios mutually related to each other. Till today, we have just been talking of long, middle or short faces, that indicate mainly vertical relations. The geometrical shape, instead, has been too often forgotten, although it is so essential in defining the anatomical integrated vertical and transversal bases of our personal perception of Beauty and aesthetical taste.

to be continued .....

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