

# Faces, the Frontiers of Normality

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The terms *face*, *figure*, and *visage* are polysemantic and do not have the same significance whether used by artists, philosophers, or physicians. In Ancient Greek, 2 different types of words expressed the face. Aristotle's *physiognomia* is the art to consider somebody according to his features, his physiognomy. The *prosopon* (πρόσωπον) was more widely used. Its etymology refers to the eyes, to what is in front of the eyes. Another word for the face was *metopon*, which signifies more precisely the forehead, but also derives from the eyes (*meta-opsis*, next to the view). It is interesting to note that the word *prosopon* may also design a person or a mask. The word *visage* is issued from the Latin *visus*, past participle of the verb *videre*, something given to be seen. The Romans also used the word *vultus* which refers more directly to the superior part of the face, and the word *os*, which signifies the mouth, the aperture, the orifice of the speech, and also the entire face. In German, *das Gesicht* is derived as well from *die Sicht*, the view. These linguistic considerations demonstrate a strong link between the meaning of the face and the look. No doubt, in every culture and language, naming the human face has been expressed by multiple words, which varied according to how one considers this part of the head: a complex anatomical structure, a center of senses and emotions, the appearance of a person, how we view our selves or other individuals. To schematize, the term *human face* is either an anatomical entity, or a spiritual symbol linked to a person's image, and for some to the soul.

## ARCHEOLOGY

The most ancient human fossils identified as *homo sapiens* have been found in Jebel Irhoud (actual Maroco) in 1960. The exact dating of these remains was obtained in 2017: –300,000 years. Although their brain did not reach the size and shape of today, paleoanthropologists have classified them as *sapiens*, not because of their DNA, but because they share with the modern-men anatomical features like the morphology of the face, short, flat, and redressed. Representing the human face is also one of the oldest work arts of mankind, as if the artist would like to share the insight of a person with the others. Twenty-five thousand years ago, our ancestors of the Superior Paleolithic decided to carve in mammoth's ivory what has been called the Venus of Brassempouy (Fig. 1A), which is the most ancient representation of a human face known today. This figurine, of 3.65 cm high, 2.2 cm deep, and 1.9 cm wide, with the forehead, nose, and brows carved in relief, while the mouth is absent, leads us to think that the artist had not only in mind to represent a figure, but to give her a spirit or a soul. (The figurine was discovered in 1881 during an archeological investigation of a Brassempouy cave, in the South West of France). Similar

observations could be made on the Cycladic sculptures of human-like goddesses found in the Aegean Sea and created between 5000 and 2400 BC (Fig. 1B), where the only feature emerging from their slim faces is the nose, the mouth, and the brows. In spite of this simplicity, and the omission of certain features, the artists have created a tension between the abstract and the real in these stylized human faces.

## LEONARDO DA VINCI

The art of portraiture is to convey to the viewer not only the anatomical appearance of the subject but also his insight, his character, his emotions. If the painted or sculptured portraits date back to the Egyptian, Cretan, Greek, or Roman antiquity, a real science of portraiture has taken place with artists of the Renaissance, like Albrecht Dürer (1471–1528) or Leonardo da Vinci (1452–1519). Influenced by the polymath and humanist Leon Battista Alberti who had written a treatise on painting (*De la pictura*, 1435), Leonardo firmly believed that anatomical study was essential for an artist because properly depicting people requires beginning with an understanding of what is inside. His initial anatomical studies focused on human skulls. His idea was not only to depict the bony framework of the face, but also to locate, near the center of the brain, the cavity that he thought contained the *senso commune*, or confluence of the senses. “The soul seems to reside in the judgment, and judgment would seem to be seated in that part where all the senses meet, and this is called the *senso commune*,” he wrote. In his drawings of faces and human bodies, Leonardo has been also very much influenced by the architect Marcus Vitruvius Pollio (born around 80 BC), which Alberti often quoted. What made Vitruvius appealing to Leonardo was that he gave concrete expression to an analogy that went back to Plato and the ancients, one that had become a metaphor of Renaissance humanism: the relationship between the microcosm of man and the macrocosm of the earth. The proportions of the human body and the description of a way to put a man in a circle and square to determine the ideal proportion of a church, according to Vitruvius, is at the origin of one of the most famous drawing of Leonardo: *The Vitruvian Man*. Leonardo was fascinated by the average proportions of the body and the face. Using a dozen young men as models, he measured their body parts from head to toe. His descriptions and drawings included both the average size of the parts and the proportional relationship between different parts (Fig. 2A, B). “The space from the mouth to the bottom of the chin is one-seventh of the face, the space from the mouth to the bottom of the chin is one-fourth of the face and equal to the width of the mouth. The space from the chin to the base of the nose is one third of the face and equal to the length of the nose to the forehead.” For these sometimes-obsessional relationships of the body-parts, Leonardo was also very much influenced by one of his closest friends, the mathematician Luca Pacioli. He illustrated his famous book on divine proportions (*de divina proportione*), published in 1509.

In parallel to these very calculated figures, Leonardo produced for the amusement of the Sforza court in Milan, funny looking people, commonly called his “grotesques.” He would walk around town, finding people to use as models, and record the most interesting ones in a portable notebook. He developed a trick for

From Geneva, Switzerland.

Received January 22, 2019.

Accepted for publication January 26, 2019.

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The author reports no conflicts of interest.

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ISSN: 1049-2275

DOI: 10.1097/SCS.0000000000005433



FIGURE 1. (A) Venus of Brassempouy. (B) Cycladic goddess.

noting these features so that he could draw them later. It involved shorthand for 10 types of noses, like straight, bulbous, and hollow, 11 types of facial shapes and various characteristics that could be categorized. These face-finding excursions, along with the sketches that resulted, helped him in his quest to find ways to relate facial features to inner personality.<sup>1</sup> We have shown in a recent article<sup>2</sup> the multiple measurements, variations, and classifications of the human heads made by various artists, anthropologists, and physicians throughout the centuries. These measurements and classifications have often led to stigmatize persons or groups of individuals and create scales of beauty and intelligence linked to their physical appearance. Leonardo rejected the scientific validity of these methods and dismissed it as akin to astrology and alchemy: “I will not dwell on false physiognomy and palm-reading, because there is no truth in them, and illusions of this kind have no scientific foundation,” he wrote.

### GASPARE TAGLIACOZZI

*De Curtorum Chirurgia per Insitionem*, which translates to *On the Surgery of Mutilation by Grafting* published in 1597, is for many the founding book of plastic and reconstructive surgery. The drawings and descriptions of the arm flap to replace a missing nose or lip have often been reproduced; however very little has been said about the tens of pages of writings related to the conception and significance

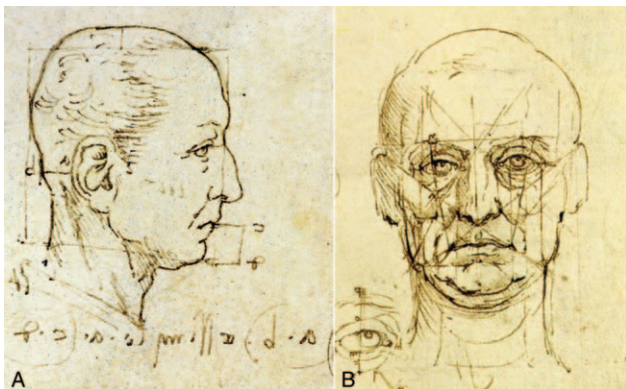


FIGURE 2. (A, B) Facial proportions by Leonardo da Vinci.

of the face. Gaspare Tagliacozzi is a surgeon, but he is also a physician who wants to know the meaning of the organs he is repairing in his patients. After a first introductory chapter where he exposes the excellence and utility of the terminology of the facial features, he then calls us to consider the supremacy of the face over the other parts of the body: “In fact, when the excellent divine wisdom blazes as a mirror in the body, although all the parts are representative, it is only the face which by its nature joined with its particular beauty reflects the harmony of our soul and very much outpaces all the other parts of the body. This distinction is evident for the eyes.” Quoting Aristotle, he recalls that it is only in humans that we use the word *prosopon*, the part located between the upper cranium and the neck. “Nature has given a visage only in men. In the other creatures, we speak of muzzles, groins or beaks.”

The second chapter is devoted to the *dignity of the face according to the philosophers, the poets, and other disciplines*. “The senses and the important functions of the relational life, vision, hearing, speech, eating, taste, respiration, and olfaction are all united at the level of the face,” he wrote. It should therefore be considered as the nobler, the highest dignity compared to the other parts of the body. It is for this reason that nature has placed the face at the highest place, as in a work of art. Wisdom of nature has separated and located the face high up in a respectable place, far away from the genitals, which are down, like we put the animals downstairs in the stables. Quoting the poet Ovid:

“Pronaque quum spectent animalia cetera terram, Os homini sublime dedit, coelumque tueri Jussit, et erectos ad sidera tollere vultus.”

(The animals bent forward look to the earth; the men received a face to contemplate the sky), Tagliacozzi adds that men is the unique animal who walks fully erect, the unique who looks straight in front of himself and can modulate his voice. He goes on to describe the different parts of the face: eyelids, ears, lips, cheeks, and nose, recalling the interpretations of the ancient physiognomists since the Greek antiquity, and the proportions as described Vitruvius and Leonardo da Vinci. The face is divided into 3 levels; the upper reflects the wisdom, the middle the beauty, and the lower the honesty. Other considerations about the face include indication of the gender, hereditary resemblance, signs of aging, great variety of appearance in mankind. In the chapter entitled *Die faciei dignitate secundum medicos* (beauty of the face according to the physicians), he recalls in detail the bad prognosis of the so-called *Hippocratic facies*: the nose sharp, the eyes sunken, the temples fallen in, the ears cold and drawn in and their lobes distorted, the skin of the face hard, stretched and dry, and the color of the face pale or dusky. He attributes certain aspects of the face to troubles of temperament, like anger, shame, fright, pain, melancholia, or joy, and also to incipient diseases, giving a number of signs suggestive of a diagnosis.

Each organ of the face is then considered separately. Starting with 3 chapters on the nose, Tagliacozzi affirms that in spite of the fact that all parts are honorable, have their own grace and are disposed in a suave harmony, the position of the nose and its proportions make it a central element for the beauty of the face. If the nose is deformed or wounded, the whole harmony is broken. The proof is that nothing is more humiliating than a nose amputation. To support this statement, Tagliacozzi reckoned that in the Ancient Testament, those who had a too big, too small, or deformed nose were excluded from sacerdoce and sacrifices. The British St Ebba mutilated herself and was followed by all her companion sisters, so that the Danish invaders would not violate them. Several criminals had their nose amputated as a punishment for their crime. The emperor Justinian II had his nose cut off by the usurper Leonce, so that he could not ascend again to the Byzantine throne. Moreover,

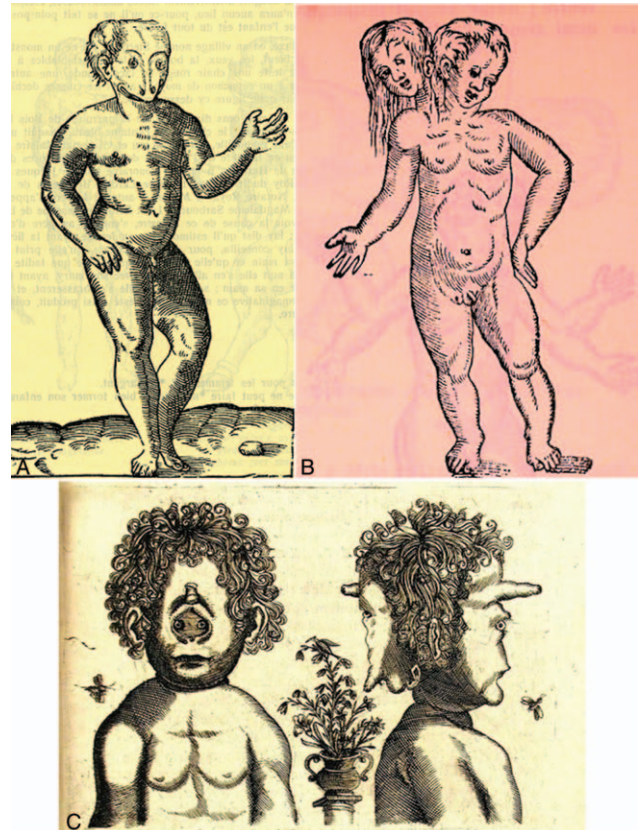


**FIGURE 3.** (A) Cynocephalus (Chronicle of Nuremberg). (B) Sciapod (Chronicle of Nuremberg). (C) Blemmy (Chronicle of Nuremberg). (D) Craniopages engraved in 1495.

“a nose cut off discloses the cavities and the internal recesses, as a large and obscure cavern, a horrible and certainly repugnant show that I would not advise to anybody,” he wrote. In brief, the Bolognese surgeon Gaspare Tagliacozzi summarizes for his contemporaneous physicians all that has been written and known about face at his time, adding many comments and observations of his own. It forms the basis of his dedication to surgical repair.

### THE BOOKS OF PRODIGES

Chinese, Indian, Babylonian, Egyptian, Greek, and Roman histories and mythologies are packed with descriptions and representations of faces that have most often been called “monstrous” (from Latin *monstrum*, divine omen, portent, sign; abnormal shape, because they warn, ostend, portend and predict, as Cicero wrote in *De Divinatione*). These dysmorphic figures were either of pure imagination, or a combination of different animals, or what we call today a teratological abnormality. The history and the signification of these “monsters” have been studied and discussed by a series of authors, mainly from ancient Greece and Rome, the most famous being Herodotus (450 BC), Aristotle (384–322 BC) in *Generation of Animals*, and Pliny the Elder in his *Historia Naturalis* (AD 78), where he describes monstrous races like the so-called *Cynocephalus* or Dog-Heads (Fig. 3A), the *Sciapodae* whose single foot could act as a sunshade (Fig. 3B), the mouth less *Astomi* who lived on scents or the *Blemmyes* with the eyes on the chest (Fig. 3C). These highly extravagant individuals were displayed to create curiosity but mostly fright and horror. Drawings illustrating these imaginary races, together with congenital anomalies, like Cyclops, conjoined twins (Fig. 3D) or hermaphrodites were largely displayed during the Renaissance, thanks to a series of printed encyclopedias, usually catalogued as Books of prodigies: the *Chronicle of Nuremberg* by Hartmann Schedel in 1495, the *Trostbüchlein* by Jakob Rüff in 1554, the *Chronicles on Prodigies and Miracles* by Conrad Lycostenes in 1557, the *Prodigious Histories* by Boaistuau et Tesserant in 1560, the *Five books of the Imposture* by Jean Wier in 1567, the *Universal Cosmography* by André Thévet in 1574. The same year, the famous French surgeon Ambroise Paré also decided to write and



**FIGURE 4.** (A) Ambroise Paré: Prodigious figure of a child with the face of a frog. (B) Ambroise Paré: Portrait of a monster with 2 heads, 1 male and 1 female. (C) Fortunio Liceti: Figure of a monster.

to illustrate a book entitled *Of Monsters and Prodigies* (Fig. 4A and B). Inspired by the preceding tales and other stories that he had collected, Paré was able to produce a fascinating atlas of all kinds of monstrosities, giving their possible origins: “There are reckoned to be many causes of monsters, the first whereof is the glory of God. . . . Another cause is that God may punish men’s wickedness. . . . The third cause is the abundance or insufficiency of seed . . . .” He also takes into account the hereditary diseases, the size of the womb, the fact that the mother sustained an accident or to her imagination during pregnancy.

During the seventeenth century, the list of philosopher, scholars, and physicians studying and writing on similar themes did not cease: Johannes-Georg Schenck von Grafenberg in 1609 *Monstrorum historia memorabilis*, Conrad Potinius in 1626 *Prognosticum Divinum*, Fortunio Liceti in 1634 *De monstrorum causis, natura, et differentiis*, Ulysse Aldrovandi in 1642, *Monstrorum Historia*, Thomae Bartholini in 1657, *Historiarum anatomicarum rariorum*, Jobi Von Meeckeren in 1682, *Medico surgical observations*, and several other of the same type. Flipping through these books, one discovers an endless list of bizarre and deformed creatures (Fig. 3C), but also more and more children or fetuses corresponding to congenital anomalies well recognized today. Although the supposed causes and interpretation of these “monsters” were highly whimsical and speculative in light of our present knowledge, these books have set the basis of our modern science of *teratology* (from the Greek *τέρας*, sign send by the gods, monstrous), which has been developed during the next centuries.

## SACRIFICING OR TREATING THE MONSTROUS CREATURES

The attitudes of the parents, the society, and the physicians toward these malformed children have usually been fear and reject. Already in Mesopotamian clay tablets (seventh century BC) one can find a list of abnormalities with the related divination like: “When a woman gives birth to an infant whose nostrils are absent, the country will be in affliction and the house of the man ruined.” In ancient Greece and Rome, they were also often identified as cause of disasters. In Sparta, “the ill-born and deformed, were sent to the so-called *Apothekae*, a chasm-like place at the foot of Mount Taÿgetus,” according to the historian Plutarch (46–120 AD). In Rome they were thrown in the Tiber. Very few voices pleaded for considering these so-called monsters as human beings. Saint Augustine of Hippone (354–430 AD) recalling the descriptions made by Pliny of the monstrous races affirms however that they should be considered like any other offspring: “we are not bound to believe all we hear of these monstrosities. But whoever is anywhere born a man, that is, a rational, mortal animal, no matter what unusual appearance he presents in color, movement, sound, nor how peculiar he is in some power, part, or quality of his nature, no Christian can doubt that he springs from that one protoplast.” During the Renaissance, similar questions were debated. The surgeon Ambroise Paré believed that they are creatures against nature and are often signs of some misfortune to come. His contemporary surgeon, Pierre Franco, however, refused to call them “monsters.” They are God’s creatures, and if possible they should be operated. This attitude led Franco to describe several methods for the cure of cleft lip in particular.<sup>3</sup> The French writer Montaigne living also at the same period, gives a detailed description of conjoined twins and concludes: “Those that we call monsters are not so to God, who sees in the immensity of His work, the infinite forms that He has comprehended therein. From His all wisdom nothing but good, common, and regular proceeds, but we do not discern the disposition and relation. Whatever falls out contrary to custom we say is contrary to nature, but nothing, whatever it be, is contrary to Her.”<sup>4</sup>

### NORMAL, ABNORMAL, PATHOLOGICAL

Among the most outstanding scientists who discovered and analyzed the normal and abnormal development of the embryo and the fetus, the French Isidore Geoffroi Saint-Hilaire (1805–1861) has contributed greatly to the classification of the congenital anomalies in animals and men. Saint-Hilaire makes a distinction between simple anatomical variations (like an absent muscle), conformation’s vices (like a cleft lip, a hypospadias) and the monstrosities (like a cyclopean) which present complex anomalies that forbid the affected individual to have several important natural functions and render his aspect far different from the other of the same species. In this classification made on discrimination and hierarchy, anomalies are ordained according to their growing complexity and growing gravity.

Emile Durkheim (1858–1917), often considered as the father of modern sociology, described what he called the “social facts,” that are things to be observed objectively. He also introduced the concept of relativity between the normal and the pathological. According to him, social facts are relative in nature which means they vary from society to society. Normal social facts at 1 place may be regarded as pathological at another. For instance, to kiss a woman is a normal social fact in America, but in India, it is regarded as a pathological social fact. The criteria suggested by Durkheim for distinguishing normal from pathological social facts are statistical and structural, not moral. In the middle of the twentieth century, another French philosopher and physician, Georges Canguilhem (1904–1995), made an important contribution to the history of science and medicine. In his book *Le normal et le*

*pathologique* 1943 (The normal and the pathological), he analyzes in a radically new way how health and disease were defined in the early 19th century, showing that the emerging categories of the normal and the pathological were far from being objective scientific concepts.<sup>5</sup> He questioned the validity as to who and what can be considered as normal (from Latin *norma* = rule, square angle). Is it a statistical value, are we normal because we are similar to the most numerous individuals or because we conform to an ideal individual of our species? Canguilhem makes also a clear distinction between a disease, a pathological state (from the Greek πάθος, suffering, pain, distress), and an anomaly (from the Greek ανωμαλία, asperity, irregularity) which may or may not provoke a suffering. Since his pioneer’s work, the definitions of health and normality, opposed to disease, pathological state, disability, handicap, abnormality, and anomaly, have been debated by many ethicists, physio- and psychopathologists, who have emphasized the different points of view, as to whether they are considered by the patients, the doctors, or the social milieu. It is well known that an ideal shape of head or face varies according to cultural traditions.<sup>2</sup> The questions therefore arise: what are the limits of normality of a human face. Is it a subjective feeling of an individual toward his own face or the face of his neighbor or is it a matter of society, an ethnic group accepting certain features and rejecting others because they do not fit to their image? These semantic debates seem very theoretical for the daily practice of surgeons, but they may sometimes be critical for decision-making in the treatment of congenital malformations or other congenital disorders.

### THE PLASTIC SURGEON, FACE-TO-FACE

Numerous philosophers, social scientists, psychologists, and physicians have analyzed and contributed to the understanding of the personal identity in relation to the facial features. The privilege to be a plastic surgeon gives, however, a unique opportunity to be the witness and have a deeper understanding of what makes a normal and acceptable face for an individual and what does not. This privilege over other specialties comes from several factors: We meet daily with a number of persons who consult for a problem of facial anomaly or disharmony; as doctors, we collect their confidences, their doubts, their requests; we have a thorough knowledge of the 3-dimensional anatomical structures which are responsible for the most subtle forms of the facial appearance, and as surgeons we are called in many cases to modify or to reconstruct these organs or parts of the visage. In addition, it is our duty to follow up the persons who have been operated, sometimes for several years, to evaluate the results and the modifications obtained by the operations. This expert’s position allows us to scrutinize the frontiers of normality for a better understanding of each patient’s request, to distinguish individuals who seek a simple cosmetic improvement from the ones whose features induce a real suffering, or from dysmorphic personalities who require psychiatric care.

Considering the children affected with facial congenital malformation, it is obvious, as pointed out by Geoffroi Saint Hilaire, that the levels of deformities are very variable, between a incomplete cleft lip and a double facial cleft lip and palate, between a mild facial asymmetry and a first and second branchial arch syndrome, or a major plagiocephaly, between a moderate enlargement of the interorbital distance and a major hypertelorbitism. But we also know that each child and each parent experience the same anomaly in a very different way. Statistics concerning the frequency of congenital anomalies or disorders do not reflect these variations.

### SURGERY AND NORMALITY

We are indebted to a group of social scientists, ethicists, philosophers, jurists, pediatricians, patients, and a plastic surgeon, Jeffrey

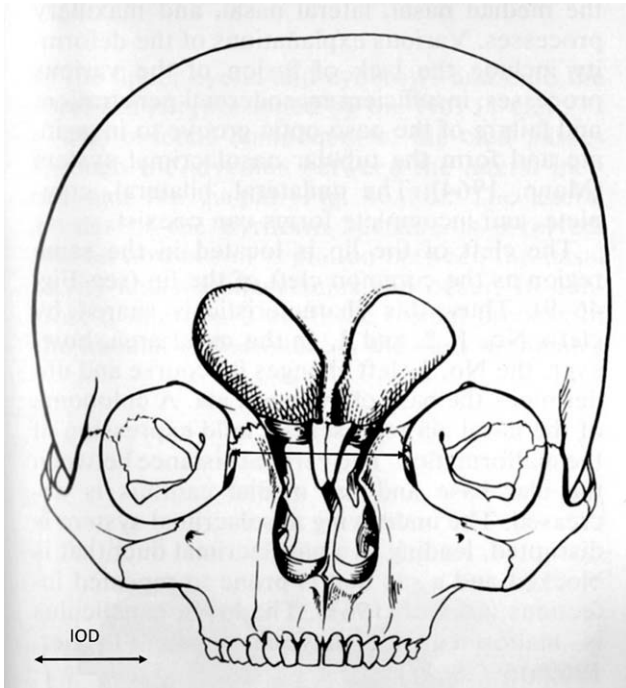


FIGURE 5. Interorbital distance to classify degree of hypertelorism.

Marsch, to have tackled the subject of the moral and practical dilemmas that arise in case of children born with severe and moderate congenital abnormalities like craniofacial deformity, short limbs and ambiguous genitalia, in a project entitled *Surgically shaping children, technology, ethics, and the pursuit of normality*.<sup>6</sup> Particularly relevant for our specialty is a chapter dealing with the outcome assessment in craniofacial care, the difficulties in establishing an evidence base in craniofacial care: How much evidence is necessary before an intervention is recommended or withheld? What counts as evidence and who determines that? As we know, there is no simple relationship between craniofacial appearance and psychosocial outcomes. As surgeons, we probably would agree with Marsh<sup>7</sup> that our principle is that the goal of the treatment is to minimize the stigmata of the deformity so that the individual can enter adult life as if deformity had not happened. We may also agree that normalization is noxious if “normal” means “ideal;” the pursuit of normalization in that sense raises the specter of homogenization, that is the belief there exists some ideal mathematical set of traits that define beauty.

Another question and probably one of the most important raised by this study and by the frontiers of normality, is the decision to operate at an early age. Nowadays, with the security of modern anesthesiology, the cure of cleft lip and palate is widely recognized and encounters few opponents; but what about major craniofacial operations that may possibly lead to serious complications, including death. Who should take the decision to operate at an early age: the doctors, the parents? At what age a child can give a reasonable opinion that may differ from his parents? Surgery for symmetrical hypertelorism is an example where the frontier of normality is particularly relevant. It involves a major operation for a condition that might not be desired at an adult age. The average adult

interorbital distance is 25 mm in women and 28 mm in men. Paul Tessier has classified the variation of the interorbital distance in adults in 3°: 30 to 34 mm, 34 to 40 mm, >40 mm. In children the severity grading is based on age and gender matched norms as the average IOD increases from 18.5 mm at age 1 to 26 mm at age 12. The previous degrees are calculated as an increased deviation from the norm (+4–10 mm, +4.1 to 8 mm, > 8 mm) (Fig. 5). Of course, nobody would decide to operate for a question of mm. In cases of 2nd and 3rd degree, there is an obvious advantage to operate early; but what about children presenting the 1st degree? As an example, a patient of mine was born with severe craniofacial malformation including cleft lip, plagiocephaly with asymmetrical height of the orbits and hypertelorism (IOD 24 mm). The cleft was operated at 6 months, the plagiocephaly at age 2, with the plan to correct the hypertelorism later if she decided. She came back at age 18, asking only for a rhinoplasty, being perfectly happy with the wide distance (IOD 32 mm) between her (now symmetrical) orbits.<sup>8</sup>

### FACIAL TRANSFORMATION AND IDENTITY

There is no such thing as a “normal” human face. At the same time there are an infinite number of variations, from the subtler ones to what were considered before as monstrous.<sup>9</sup>

Facial normality will always remain a dubious concept. Plastic and craniomaxillofacial surgery’s goals are not normalization of a person’s face. If there are “standard operations” for such or such malformation, these operations should always be directed to keep or restore the figure of an individual in particular, as each one has a unique identity. This means an understanding of the patient’s need, a thorough dialogue with him or his parents, and a long follow-up after every procedure. Operating on the “noblest” organ of the body, the one who reflects part of the person’s identity as described by Tagliacozzi is the great privilege of the facial plastic surgeon; it also confers to him a major responsibility, keeping in mind Tagliacozzi’s motto: “We restore, rebuild, and make whole those parts which nature hath given, but which fortune has taken away. Not so much that it may delight the eye, but that it might buoy up the spirit, and help the mind of the afflicted.”

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