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REVIEW

Numeric Expression of Aesthetics and Beauty

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Abstract Debate over what constitutes beauty, particularly beauty of the human body, has raged since philosophy began. Interested scholars have debated the meaning of beauty for centuries. However, it seems that numbers and the resulting numeric relationships play a fundamental role in the classification of the human body, and that a harmonic profile or body shape is produced only at certain definite numeric relationships. The beauty of individual features depends on "ideal" proportions, and it is suggested that expressing beauty in terms of geometry is possible. As the demand for aesthetic surgery has increased tremendously over the past few decades, it is becoming essential to be able to assess the possible satisfaction that can be expected after an aesthetic surgery procedure and to determine the beauty of the final result as precisely as possible.

Keywords Aesthetics · Beauty · Harmonic profile · Ideal proportions · Numeric expression

Because of the tremendous increase in demand for all types of both facial and body contour aesthetic procedures, an understanding of beauty is becoming of utmost importance in various settings of medical practice [1]. A satisfactory cosmetic result and optimal healing is the aim of aesthetic surgery. It is essential therefore to be able to assess the possible satisfaction that can be expected after an aesthetic surgery procedure and to determine the beauty of the final result as precisely as possible [2].

Interested scholars have debated the meaning of beauty for centuries [3]. In contemporary society, the media are largely responsible for providing universal yardsticks against which individual faces and body shapes are measured [3]. It appears that youth and symmetry are the most highly prized attributes of beauty [3]. Although experiments with holistic or individual feature representations of the human body have demonstrated the importance of features in discriminative tasks, studies suggest that humans perceive faces and body shapes holistically and not as individual features [4,5]. The beauty of individual features depends on "ideal" proportions [4].

It seems that numbers and the resulting numeric relationships play a fundamental role in the classification of the human body, and that a harmonic profile or body shape is produced only at certain definite numeric relationships [6]. It is suggested that expressing beauty in terms of geometry is possible [6]. The resulting canons and constructive ideals of beauty provide definite aids and guidelines in plastic surgery [6].

To date, the most favored preferences have been for the ratios of unity (1:1) and the golden section (1.618:1) [7,8]. Perhaps Pythagoras was right after all in maintaining that mathematics underlies all and serves as the very basis of beauty [9]. Plato's Timaeus even claimed that within the properties of numbers themselves, the essence of the universe could be found, and aesthetics is seen as a branch of this numeric cosmology [10].

Historical Background

Although beautiful individuals make up a small percentage of the population [11], beautiful and harmonious human

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figures have been present in artistic representations since antiquity. Body measurements were used by the old Egyptians to execute their famous sculptures and paintings. Facial measurements were first performed by the Greeks as part of total body measurements for the same purpose [12]. Rules defining the relationships between various face and body features were more clearly formulated by scholars and artists of the Renaissance based on classical Greek canons [13].

More recently, the reasons for these measurements have not always been the same. Some investigators have applied such measurements to create the art of ultimate beauty, whereas others have used measurements of human beings to imply that certain groups of people are superior [12]. In modern medicine, the use of neoclassical formulas of human harmonious proportions was propagated by the artist-anatomists of the 17th to the 19th centuries [13].

The Secret of Beauty

Debate over what constitutes beauty, particularly beauty of the human body, has raged since philosophy began [1]. What is beauty and why are some humans considered more beautiful than others? [14]. Has the construct of beauty changed over time? Is our sense of beauty learned or innate? What is beauty, and can we quantify it? [15].

Beauty is a universal phenomenon, present across many species and all ages, [1] that heightens and clarifies our relationship to the world [16]. It is a universal part of human experience provoking pleasure, riveting attention, and impelling actions that help ensure survival of our genes [4]. As the formal aspect of idealization, it can embody the finest and most transcendent values in the human aesthetic experience [16,17]. From the Renaissance artists to the present day, the quantitative definition of human beauty has been a "Holy Grail" [1], and since antiquity, scholars and scientists have investigated the roots and effects of beauty, defining it in many different ways [9,15,18].

According to a modern definition, beauty is "excelling in grace or form, charm or colouring, qualities which delight the eye and call forth that admiration of the human face in figure or other objects" [18]. Nevertheless, beauty is a mystery that has been with us for ages, and its presence is ubiquitous [9,15]. It is something we can recognize in an instant, yet it still is difficult to formulate [4].

Beauty is essentially a visual phenomenon and therefore is exposed to the influences of optical illusions [1]. To be perceived as beautiful, structures need to be visually appealing and capable of evoking an emotional level of pleasure [19]. The visual processing of human faces, the most complex and captivating structure in nature, whose attractiveness influences much of our behavior and social interaction, has attracted the imagination and received the attention of philosophers and scientists such as Aristotle and Darwin for centuries. The face has received most of the attention and generated most of the studies related to beauty and attractiveness [1,4,20]. Concepts and rules derived from these studies, however, may be applicable to all parts of the human body.

The notion that beauty is in the eye of the beholder, and that individual attraction is not predictable beyond our knowledge of a person's particular culture, historical era, or personal history has been widely held for centuries. However, more recent work suggests that beauty is not an inexplicable quality that lies only in the eye of the beholder and that the constituents of beauty are neither arbitrary nor strictly culture bound [4]. Beauty is a perception of the physical form appreciated by the observer. Such a concept suggests that it comprises two distinct but competing elements—the one who is beautiful and the other who considers the one beautiful—the "subject versus beholder hypothesis" [1].

Despite an apparent impression that every human society has its own standards [3] and despite the fact that when culturally isolated populations are taken into account, some supposedly invariant standards may prove malleable [14], cultural invariance combined with an adaptive potential has been used to support an adaptationist explanation of human beauty and to set culturally invariant standards of beauty [14]. It seems that there is a universal standard for beauty regardless of race, age, sex, and other variables [21,22]. There is, however, evidence that certain perceptions of beauty change with time [15] and that the recent globalization of modern society has wrought changes in our perceptions of beauty [15]. Most cultures to date have been exposed to the potentially confounding influence of the Western media. Many of the remotest places on earth have access to television, cinema, and advertising posters displaying exceptionally "wasp-waisted" gynoid females draped over desirable products such as cars and beer [14].

Beauty and Attractiveness

As mentioned earlier, the face has received most of the attention, and mankind's interest in facial attractiveness and its study date back to the beginnings of recorded history. Determining the essence of this quality and its nature has occupied us individually and collectively at least from the time of the Egyptians 4,000 years ago [12,23,24]. Attractiveness is an essential attribute of beauty, and biologically, beauty is something that the visual processing segment of the nervous system finds attractive [1,25]. These biologic phenomena are operative during early

adulthood [26]. But what makes a female or male figure attractive?

The observation of true beauty arouses an emotional level of pleasure perceived not in the neocortex, but deep within the subconscious limbic system [1,27]. Such an arrangement has developed in response to the pressures that have shaped the brain throughout its evolution [1,28]. Findings indicate also that brain activations during aesthetic judgment cannot be reduced to an assessment of symmetry, but actually are due to a particular mode of judgment relying on a network that overlaps partially with underlying evaluative judgments made on social, religious, or moral cues [29].

More precisely, aesthetic judgments can be considered a subset of evaluative judgments that, in contrast to descriptive ones, are reported to engage frontomedian areas around Brodmann areas (BA) 9 and 10, mostly together with the posterior cingulate cortex or precuneus as well as the ventral prefrontal cortex around BA 45/47 [29–33]. Moreover, both aesthetic and symmetry judgments rely on a set of areas supporting high-level visual analysis [29]. Interestingly, ganglion cells in the retina are arranged so as to increase the dark–light boundary, making the visual cortex particularly sensitive to contrast, which is perceived as an attractive stimulus [1].

We commonly think that attractiveness is based on subjective impressions largely affected by cultural standards [22]. This may not be correct [34]. Several rating studies have demonstrated high cross-cultural agreement in attractiveness rating of faces representing different ethnicities [4,35–37]. Faces judged to be very attractive in one society are judged to be equally attractive in other societies [22]. Moreover, research findings from the field of psychology not only show that judges strongly agree about facial attractiveness but also indicate that a universal standard of facial attractiveness does in fact likely exist [38,39]. Likewise, in evaluating human body attractiveness, despite some cross-cultural differences, it also was shown, for example, that waist-to-chest ratio, body mass index (BMI), and waist-to-hip ratio are the major cues to women's ratings of men's bodily attractiveness regardless of the cultural setting [24,40,41].

More recent studies have shown that the attractiveness of a woman's figure can be predicted exactly from her body measurements. Important predictors in that regard are bust-to-underbust ratio, bust-to-waist ratio, bust-to-hip ratio, waist-to-leg ratio, and an androgyny index (an indicator of a typically female body) [42]. If different people can agree on which faces and body shapes are attractive and which are not when judging individuals of varying ethnic background, this suggests that people everywhere are using similar criteria in their judgments [4]. This high congruence over ethnicity, social class, age, and sex has led to the belief that perception of attractiveness is data driven and does not depend on any single feature [34], and that the properties of a particular set of features are the same irrespective of the perceiver [4].

It also seems that judgment of attractiveness is an instinctive phenomenon suggesting an innate ability to appreciate beautiful form and balance irrespective of ethnic origin [1,27,43,44]. Nevertheless, the general body of facial attractiveness research has shown that subjective attractiveness represents only a thin layer of personal preferences overlaid on a much larger and inevitable biologic objective assessment of attractiveness [23]. From an evolutionary standpoint, function always precedes form [1,27], and evolutionary psychologists have argued for the existence of universally shared criteria of attractiveness, which are potent cues to a person's potential reproductive success [41,45]. A substantial amount of work supports a Darwinian theory of selection, which predicts a survival advantage based on physical attractiveness [15]. This has been an issue since the dawn of sexual reproduction [1].

If the genetic objective of life is to mate with the best available partner, any features promoting the owner's genome will therefore be a favorable investment [1]. Throughout the higher animal kingdom, reproductive division of labor between the sexes has led to greater success through role specialization. Beauty is a consequence of this process, exploited to demonstrate fecundity and attract a suitable partner [1]. Theory suggests that sexually reproducing organisms choose mates displaying characteristics indicative of high genotypic or phenotypic quality. Attraction to beautiful individuals may therefore be an adaptation for choosing high-quality mates [14].

Although evolutionary biology holds that in any given population, extreme characteristics tend to fall away in favor of average ones [4], natural variation within a species creates a range of phenotypes and thus a rank of survival advantage, "survival of the prettiest," with some better adapted to attract a partner than others [1]. A reliable connection exists, for example, between male body attractiveness and male fitness and qualities such as health and vigor [40,46]. Likewise, woman's sexual attractiveness might be based on the ratio between her waist and hip measurements, a reliable index of her reproductive potential [47].

An interesting finding, however, is a biologic trend away from perfect symmetry in primates consequent to adaptive evolutionary alteration favoring functional asymmetry [48]. Studies have demonstrated that the right hemisphere is dominant for visual recognition and identification, whereas the left hemisphere is associated with the perception and production of language. However, the degree of labor divisions differs between the sexes. Men are more functionally lateralized for visuospacial skills and women for language [1,49]. Moreover, beauty is shown to be more

pronounced on the right side of women faces (men show no difference), with lateralizing of facial expressions on the left. This lateralization is perceived by the left hemisphere of the observer, allowing beauty to be emphasized on the right side of the face and perceived by a male's right (preferred) hemisphere [1,49]. The finding that no such mechanism for characterizing beauty is present in females confirms that beauty is a male-driven emotion based in evolutionary neuropsychology rather than a purely social concept [49]. This by no means implies that females cannot experience beauty [1].

Canons of Beauty: Ideal Proportions and Harmonious Features

A common anthropometric element of all times is that man has tried to catch physical proportions into values [12]. Despite the claim that the Egyptian artists did not use a line system to measure parts of the human body in relation to others, the principles for the canons of the human body may have been defined by them [12]. Some studies have demonstrated that Egyptian artists divided the available space for representation of human body figures from top to bottom into 22.25 like parts. It is suggested also that the Egyptians took the middle finger to be 1/19 of the adult man's length. However, well-defined landmarks such as the nipples, umbilicus, and knees were not localized along these divisions [12].

The Greeks and Romans were heavily influenced by the Egyptians [12]. Aristotle (384–322 B.C.) emphasized the proportions of aesthetics and described the science of reading one's character from one's bodily features [12,50]. Polycleitus (450–420 BC), a Greek sculptor obsessed with the beauty of male athletic bodies, seems to have been the first to define canons, probably based on Egyptian principles [12,23]. He reported the height of the face to be 1/10 the length of the body and the whole head to be 1/8 of it. The head and neck together were to be 1/6 of the athlete's length [12]. These proportions were expressed in his famous statue of Doryphorous [12,23].

Only a few centuries ago, human features and canons were not realistically acknowledged [12]. It was during the Renaissance period that the classical, originally Greek canons of proportion were formulated and documented by scholars and artists such as Durer, Alberti, Cousin, Audran, Francesca, Pacioli, Cennini, Savonarla, and da Vinci, among others [13,23], leading to the development of neoclassical canons defining primarily the interrelationships of facial structures [51]. Because of propagation by the artist-anatomists of the 17th to 19th centuries, these neoclassical canons later continued their popularity in the field of medicine [13,23].

Leonardo Da Vinci (1452–1519) probably was the first to report extensively on the proportions according to which bodies and faces should ideally be shaped, and he applied these canons in his art [12]. According to Da Vinci, in a well-proportioned face, the size of the mouth equals the distance between the parting of the lips and the edge of the chin, whereas the distance from chin to nostrils, from nostrils to eyebrows, and from eyebrows to hairline all are equal, and the height of the ear equals the length of the nose [12,52]. Albrecht Durer (1471–1528) also felt that a system of canons could be devised that would define the ideal proportions for human figures and heads [12,53]. He divided the face into three equal lengths: the forehead, the nose, and the mouth and chin [12]. Although Da Vinci dictated strict canons for facial and bodily proportions, he could not deny the natural variations of nature [12].

Neoclassical canons still are used widely in art, sculpture, and painting. They often have been used by modern plastic surgeons as working guides. Studies have been conducted recently on the validity of these canons in real populations, in Caucasians [13,23,41,54], in African Americans [51,55] and in Asians [56,57]. These studies have shown that "while some of the neoclassical canons may fit a few cases, they do not represent the average facial proportions" [13,23,57]. As a matter of fact, measurements deduced from classic works of art and science depict the subjects in the way the artist or scientist preferred them rather than how they really were [12].

The neoclassical canons, although a reliable rough working guide to facial proportions for artists and surgeons, are clearly not a valid system for analyzing the real human face [13,23]. Even in art, the influence of these canons had diminished by the late 19th century [13]. Compared with the wide range of natural proportions, the neoclassical canons represent rigid, simplistic rules. They cannot be accepted as the sole representatives of aesthetic features [13].

More recently, other objective systems have been proposed, including the anthropometric and cephalometric systems [23]. Physical anthropology has its roots in the 18th and 19th centuries, when most of the facial measurements were taken directly from skulls, and only a few soft tissue measurements were performed [12]. Unfortunately, many used facial and skull measurements during this period to show that blacks and others were inferior to whites [12,23]. Cephalometric measurements, an indirect form of craniometry (measurements from dry skulls) and facial anthropometry (measurements from live heads and faces), were introduced by Broadbent in 1931 [23], and during the first decades of the 20th century, pioneering orthodontists initiated cephalometric radiology: the quantitative determination of structural changes in radiograms of the facial skeleton [12].

The father of modern rhinoplasty, Jacques Joseph (1865–1934), presented what he considered to be the ideal nasal shape with a combined length of the three parts of the nose (the bony part, the septal cartilaginous part, and the cartilaginous and soft tissue tip) equal to the length between the base of the nose and the edge of the chin [12]. Mario Gonzalez Ulloa (1913–1995) introduced the concept of profileplasty, positing that the glabella, subnasal point, and pogonion should ideally be in line, and that this imaginary line should be perpendicular to the Frankfurt horizontal [12,58,59]. The system that began as a simple dental analysis has since developed into a more complex lateral facial skeletal analysis, sometimes enhanced by soft tissue parameters [23]. Recently, Farkas [13, 60, 61], the modern father of soft tissue facial anthropometry, has most importantly influenced modern facial soft tissue anthropometry and revised the neoclassical canons correlating these canons to current norms [12].

Golden Number Φ (phi)

In the 1960s, the golden ratio (golden number, golden proportion), an irrational number represented by the symbol Φ (phi = 1.618033988 ...), in reference to the Greek sculptor Phidias, made a reappearance and currently is used as a valid ratio between various facial and body features [8,23]. The ancient Egyptians applied the golden proportion in their architecture. Although they did not explicitly describe it, we assume that they had already been aware of its aesthetic attractiveness [12,62,63]. It was first recorded in the third century BC by the Pythagoreans and later by the Greek geometrician Euclid [12].

The golden number is a ratio obtained when a line ABC is sectioned such that AB/AC = BC/AB [23,38] (Fig. 1). It also can be derived easily from the Fibonacci sequence, in which each number is the sum of the two preceding numbers (0,1,1,2,3,5,8,13,21,34,55,89,144, ...) [64]. Surprisingly, the reciprocal of Φ is 0.618033988 ... (Φ – 1) [9]. The golden number is the only number that yields its own reciprocal when subtracted by units [19].

Phi (Φ) could be the world's most astonishing number [18]. For centuries, scholars have believed that the golden section results in the most pleasing ratio considered to be

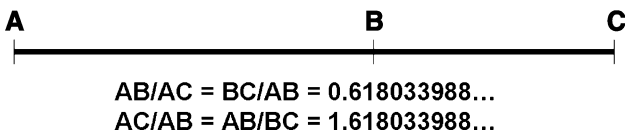

Fig. 1 The golden section Φ and its reciprocal. A line AC is divided in two segments AB and BC so that the ratio of the full line over the long segment AB is equal to the ratio of the long segment AB over the short segment BC

the cornerstone and the key to the secret of beauty [1,65,66]. It still is believed by some investigators to underlie the aesthetics of an ideal face and body shape and to be the standard for balance and beauty [23,64]. Because it is related to so many aspects of beauty, Φ later was called the divine number or proportion [1,27]. The golden number appears almost ubiquitously in nature and is found in numerous natural phenomena and geometric propositions; in art, music, and human architectural constructions [18,21,27,66–68] including the basic geometric shapes of the pentagon, decagon, and dodecagon; in the phyllotaxis or leaf arrangement of a vast number of plants and flowers; in the spiral of seashells such as the nautilus; in the human mandible and its growth rate; and even in the spiral of DNA [38,69]. It represents some remarkable relationships between aesthetically pleasing proportions of patterns exhibited by living plants and animals [18]. This golden proportion has been defined as the ratio most attractive to the human eye and mind [12].

The human figure and face share mathematically proportioned relationships similar to those of other living organisms [18,38]. Beautiful faces, for example, have ideal facial proportions directly related to the divine proportion [21]. Ricketts [27] found the width of the mouth to be Φ times the nasal width. When the width of the mouth is 1, the distance between the outer corners of the eyes is Φ. The width of the head at the temples, again, is Φ times the distance between the outer corners of the eyes. Vertically, the height of the forehead from hairline to eye pupils is 1, where the height of the face from pupils to chin is Φ.

A golden proportion may be found also when the height of the face from pupils to chin is divided into the distance between the pupils and the nasal alae on the one hand and the distance between the nasal alae and the chin on the other. If the distance between chin and mouth is 1, the distance between the mouth and the pupils, once more, is Φ [12]. Likewise, in the hand, the proportion of each phalanx to the adjacent one in every finger is in total conformity with the golden proportion [6,19].

After a proportional analysis of the human body, the Swiss-born, French-trained revolutionary architect and artist, Charles Le Corbusier, concluded that the most beautiful, harmoniously proportioned human bodies (or sculptural representations of them) contain many divine proportions [9]. Perhaps the most famous illustration relating divine proportion to human anatomy is Leonardo da Vinci's drawing of the "human figure in a circle," illustrating the proportions recorded by the Roman author Vitruvius [1,12,70].

Empirical investigations of the aesthetic properties and primacy of the golden section were among the very first topics of scientific psychological research as the new discipline emerged in the 19th century and date back to the

very origins of scientific psychology itself. The very first studies were conducted by Fechner in the 1860s [8,66]. Since that time, it has been the focus for a number of research programs, winning the attention of structuralists, gestaltists, behaviorists, social psychologists, psychiatrists, and neuroscientists at various times [8].

Adolf Zeising probably is the most significant figure in the 19th century for the revived interest in Φ [8]. Ghyka [71] and Seghers et al. [62] were the first to introduce the golden proportion into the modern medical literature. However, it was Ricketts [27,72–74] who popularized the concept in facial surgery.

It seems that through an evolutionary process, nature has created the standard of aesthetics based on the divine proportion [65]. All living organisms, including humans, are genetically encoded to develop to this proportion, perhaps because of extreme aesthetic and physiologic benefits [21]. All human beings should have the genetic potential to attain these proportions. It is proposed that such a human form upholds the law of conservation of energy, allowing maximum performance with minimum effort, and the law of conservation of tissue, requiring the minimum number of cells to perform the tasks necessary for survival. An individual may, however, fall short of achieving this form due to race, age, or sex, or because of geographic, cultural, or environmental (mainly malnutrition) factors [1,27,70]. It also seems that appreciation of this proportion is primitive and inborn. Living organisms are biologically attracted to potential mates who conform to this strict proportion [11].

A recent mathematical modeling system has been developed for human facial attractiveness by Marquardt [75,76], who used the primary pentagonal complex to form the basic framework of a mask, applying specific lines, line segments, and points to construct the component lines and points of the mask [38]. These pentagon complexes are in fact variously sized golden or regular decagons, which can be created by superimposing two same-sized golden or regular pentagons pointing in opposite directions [38].

The Marquardt mask is a facial overlay system variously called the phi, archetypal, golden, or golden ratio mask built entirely by using the ratio phi. It has been claimed adaptable to the creation of an objective system for measuring facial attractiveness [38,75,76]. The phi mask method relies on the hypothesis that attractiveness is averageness, but there is controversy regarding the significance of average and attractive [77].

Conclusion

Throughout history, studies have been conducted and still are ongoing about what constitutes the "perfect beauty," a question that scientists still need to answer, artists need to show and create in their work, and physicians need to keep and improve [78]. Currently, beauty standards are not clear. However, they should be in accordance with artistic mode and style as well as the natural form and shape of the human figure. After all, beauty should confirm certain dimensions [78].

Various disciplines have studied the nature of beauty. Individually, they provide partial answers, but when viewed together, they begin to weave provocative insights as to beauty's biologic significance [11].

Physical appearance has been an inseparable part of daily human existence [78]. The three elements that exert the greatest influence in human relationships are physical and sexual attractiveness as well as beauty. Physical attractiveness alone influences success, power, happiness, and satisfaction in life [78]. Most individuals see themselves as a reflection in a mirror and prefer to be labeled as beautiful [78].

Although researchers have found that there is a consensus on rating attractiveness across sexes and sexual orientations, ethnic groups, and ages from infants to the elderly [23], historically, the aesthetic concept of beauty is not a fixed one. It changes often, and beauty standards also are modified according to many dimensions. These are influenced by social, material, and ethnic factors, in addition to religious beliefs and customs [77,78].

The many faces of beauty through the centuries differ from one civilization to another. The roles, parameters, and dimensions of beauty also differ [78]. Unfortunately, there is no golden key to open every door for analysis of attractiveness among races [77].

A fuller evolutionary theory of human beauty must embrace variation rather than focus on "universal" traits to the exclusion of cultural effects [14]. Of course, physical features are involved in mate choice, and natural selection probably has shaped these preferences [14]. However, we obviously need a more sophisticated evolutionary analysis to explain variation in preferred body shapes and sizes that does not ignore the effects of environment on ontogeny [47].

When considered in a historical perspective, some canons of beauty seem to be in agreement with each other [12]. However, Farkas [13, 60, 61] found the proportions defined by the various described canons to be present only incidentally. The same applies to the golden proportion [12,73].

The golden section phenomenon may be unreliable and probably is artifactual [10]. Although it has been mentioned that the "average" face may very well conform to the divine proportion [11], only in the faces of a highly selected group of humans can such proportions be found [12,73]. However, there seems to be, in fact, real psychological effects associated with the golden section [66], and

studies suggest that its traditionally described aesthetic effects may well be real. However, if so, they are very thin indeed [8]. Whether the golden section per se is important, as opposed to similar ratios (1.5,1.6, or even 1.75), is very unclear [10]. Nevertheless, irrespective of age, the golden proportion will help to identify unbalanced areas and guide in accomplishing harmony and beauty [19].

Something like an artistic vision of reality is needed to remind scientists that most natural phenomena are not described adequately if they are analyzed piece by piece. That a whole cannot be attained by the accretion of isolated parts is not something the artist had to be told [79]. A recent study has shown that the attractiveness of a female figure is the result of complex interactions among numerous factors. Therefore, in the planning of a surgical intervention, it is important not to focus on a single bodily feature, but rather to watch its appearance in the context of other bodily features [42]. Measuring body features may offer additional guidelines in our clinical work, but it can never replace the intuitive judgment by the human eye [12,80]. Mathematical tools could help us to understand global complex systems independently of local details [81]. Hence, surgeons should attempt to achieve symmetry, harmony, and balance rather than duplicate any one recognized standard [19].

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