



What is Beauty?

Andrea Sisti¹ · Negaar Aryan² · Payam Sadeghi¹

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Abstract

Purpose In the current study, the authors attempt to thoroughly investigate the concept of beauty from different perspectives in different historical periods and offer their personal thoughts about it.

Methods The authors performed a comprehensive and across-the-board literature review about ‘beauty’, including beauty from a philosophical perspective, beauty perception by human mind, beauty from a biopsychological perspective, beauty of the face, body and breast, models of beauty and beauty in cosmetic surgery.

Results From Plato to modern neuro-psychological studies, the concept of beauty has always been a theme for adamant debates and passionate thoughts. Different aspects of beauty, from intellectual to pure physical, have received a tremendous amount of attention. The true definition of the concept of beauty is still ambiguous, and there is not a unanimous explanation for it. It seems that the definition of beauty differs in every individual’s mind and over the history of humankind.

Conclusion Although beauty is a very important concept and the seek for achieving it is a very natural behavior, one must remember that the importance of beauty should not

overshadow the fact that every human being is made up of similar internal organs. We strongly encourage the reader to look beyond the hedge, to be aware that each of us is made up of internal organs, beyond the external appearance.

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Keywords Beauty · Cosmetic surgery · Face · Breast · Body proportions

“Beauty is commonly associated with mystery, as something that beckons but also withdraws and withholds, something whose nature belongs with appearing but that also presents itself as containing in itself more than is apparent. While it belongs to the sensory, to the realm of feeling, and is in that sense fully present to experience, at the same time it partakes of concealment in ways not shared by the rest of sensory life. A familiar trope of beauty is that of something not just pointing beyond itself but as harbouring a secret or posing a question to be answered” [1].

Andrea Sisti and Payam Sadeghi have contributed equally.

✉ Payam Sadeghi
Drpayamsadeghi@yahoo.com

Andrea Sisti
asisti6@gmail.com

¹ Department of Plastic Surgery, Cleveland Clinic, Cleveland Clinic Main Campus, Crile Building, 6th Floor, 9500 Euclid Ave, Cleveland, Ohio 44195, USA

² Irvine, California, USA

Introduction

The definition of beauty has always been a debated subject since ancient times [2–4]. Beauty is not measurable, nevertheless, it has had many different descriptions from the

past till now. Although beauty can be seen in any objects, plants, animals, humans, etc., this article will review and evaluate different aspects of beauty in humans. Also, there are many different perspectives from which this concept can be approached. Philosophical perspective, biophysiological perspective, beauty of the face, beauty of the body, the relation between beauty and memory, and individual's perceptions of beauty are the topics that received the most attention among researchers. In this article, the authors review and examine the previous literature on the mentioned topics. This article is a comprehensive journey on the concept of beauty.

Beauty From a Philosophical Perspective

Before analyzing the different aspects of beauty in humans, it is fascinating to review and discuss the discoveries and perspectives of philosophers and scholars on this topic. It has been proved that it is almost impossible to set a singular definition of beauty. This impossibility roots in historical points of view. In fact, in every era of the history, a particular definition of beauty was prevalent, with emphasis on the female figure in artistic renditions. Not only this was described by development of the historical and artistic forms, but also in synchronic terms within the same period, in different cultural and geographical contexts.

Plato, one of the most influential philosophers of the ancient Greece, has been fascinated by the concept of beauty and attempted to explore this matter.

He deals with the question of *kalon* (the Greek word for “beauty”) in three of his famous dialogues, *Hippias Major*, *the Symposium*, and *Phaedrus*, so-called *Socratic* dialogues [5].

Hippias Major is a dialogue between Hippias and Socrates which took place in Athens between 421 and 416 BC [5]. Hippias is a well-known sophist from the city of Elis, near Sparta. The Platonic Socrates is a Greek philosopher from Athens who appears to have been very concerned with the matter of beauty at some point in his life.

In the *Hippias Major*, Socrates and Hippias thrive to define beauty itself. Hippias seems to be assuming that the experience of beauty typically (if not always) begins with noticing a beautiful person. He argues that “it’s what everyone thinks”, thus making it a legitimate belief. This belief of Hippias is reflected in the following conversation: “Socrates, if it is necessary to speak the truth, [it must be said] that a beautiful maiden is beautiful (*Parthenos kale kalon*).” However, Socrates refutes this proposition by pointing out that “a beautiful maiden” is not what beauty is, it is just an instance of beauty [5].

Through the dialogue, Hippias persists in articulating “denotative” definitions and instances of beauty, while Socrates objects. In fact, Hippias is convinced that the best way to express “beauty” is through *good* examples that everyone would agree with. For instance, Socrates refutes Hippias’s definition of beauty as “gold” by pointing out examples where adding gold would not make the instance [more] beautiful. Socrates applies here his typical way of reasoning and indicating the erroneousness of the other’s thoughts, through counterexamples. For instance, Socrates proposes Ivory as the substance for making the face, feet, and hands of statues, which Hippias admit is better than gold for making the statues more beautiful, and Socrates argues that even stone is better than gold for crafting the eyes of statues beautifully [5].

Moreover, the noteworthy disjunction between *appearing* beautiful and literally *being* beautiful is discussed in the dialogue. Socrates seems to oppose that beauty might, at least to some extent, have something to do with deception or illusion. Something deceptive “would not be what we are looking for, would it Hippias?”. Socrates insists that the beautiful should not be what makes things just appear beautiful, but it must actually be beautiful. Through this dialectic, Plato is inviting us (the readers) to wonder and to get to the “essence” of the beauty itself. Nevertheless, Socrates finishes the dialogue by commenting that he thinks he grasps the true meaning of the proverb “*beautiful things are difficult*”, thus implicitly admitting the non-uniqueness of the definition [5].

The *Symposium* is another famous dialogue from Plato and can be dated back to 416 BC [5]. One of the characters in the *Symposium*, Agathon, states that Eros is beautiful and loves beauty. Agathon’s belief regarding the beauty of Eros appears throughout the whole dialogue. In this dialogue, Eryximachus (a doctor of that time) argues:

“As Pausanias just said, to gratify those human beings who are good, is a beautiful thing, but to gratify those who are immoral is shameful. Similarly, in human bodies, it is beautiful and noble to gratify what is good and healthy in each body and should be done (this is what is called the medical *techne*), but it is shameful to gratify what is bad and sick, and one should not do so if one wants to be a medical technician (*technikos*)” [5].

Eryximachus’s “physicalist” position can only explain physical beauty; but it is known that beauty does not limit to a physical space.

Agathon points out the importance of body, and also soul. In his view, Eros has both physical and spiritual manifestations, and in determining his beauty, both aspects must be accounted for. Beauty can thus be the bridge by

which all the manifestations of Eros might be connected [5].

Furthermore, Diotima emphasizes the connection between beauty and creativity, in this way:

“All humans are pregnant, Socrates, both in body and in soul, and when we come of age, our nature is to desire to give birth. But it is impossible to give birth in ugliness, but only in beauty. The union of a man and a woman is birth. This is a divine matter” [5].

Another important dialogue written by Plato is the *Phaedrus* (418 and 416 BC) [5]. Socrates meets Phaedrus outside the city walls, and Phaedrus explains that he is taking a walk, following doctor’s orders. The first instance of beauty in this dialogue is the beauty of nature. Socrates shows himself remarkably sensitive to the beauty of the countryside: trees, fragrances, cold waters, breezes, grassy slope, and the song of the Cicadas. These natural elements are not just beautiful, however—they are inspiring [5].

Plato uses the “chariot” image, to explain human beauty and the actual experience of Eros for beauty. In Plato’s metaphor, the human soul is made up of a chariot consisting of three parts: the charioteer (human soul or conscience), a noble horse (a white horse, representing the spiritual and higher-level passions), and an ignoble horse (a black horse, representing the sublunar and lower-level passions). In this setting, Eros is a motion, specifically a “self-motion” that constitutes the being of the soul. Eros is the way which leads us to wholeness out of our experience of incompleteness. The source of the soul’s motion is located partly in the two horses, and the other part in the charioteer himself, who controls whether the horses charge forward and decide on the direction of travel, but ultimately it is in the wings shared by both the charioteer and its of horses that leads the way. Both the charioteer and the two horses are winged [5].

Plato argues that the soul lives with the gods of the sky before descending to the earth, and upon arrival, lives with nostalgia for that pre-earthly existence, seeking return. To achieve this goal, Plato argues, in addition to philosophy, there is a simpler and more accessible way: beauty. Plato reasons that the image of the world that we are always seeking is reminded by seeing beauty in this world, provoking our delight and devotion. Yearning for this semblance of beauty, whether it is in a person, a piece of art, or an object, manifests love. It occurs when the soul meets a beautiful body as a reminder of a form of beauty. This recollection of beauty causes the wings of the soul to sprout, leading to psychic torment.

More recently, other philosophers wrote about beauty. For instance, Immanuel Kant (German philosopher, 1724–1804) wrote about the structure of human reasoning and how it relates to appearances, with potential interest for

the cosmetic surgeons [6]. In the *Critique of Judgment* [7] (year 1790), Kant observes that we cannot “say” or define in logical and conceptual terms what beauty actually is. What is perceived in our conscious when we see a beautiful object, piece of art, a person, or a landscape, is described to be something that we can “feel”. At the same time, Immanuel Kant describes beauty as a matter that requires thought, whereas non-beautiful pleasures do not. According to him, what characterizes beauty is the ability to keep itself in the same form of the artwork [8].

Many other philosophers and scholars wrote on beauty throughout the history, but a complete analysis of all of their works on the matter goes beyond the scope of this study. Among the many, we encourage the reader to look into the thoughts of Nietzsche, Dostoevsky and Proust on this topic.

Beauty Perception by Human Mind

The perception of beauty is very dissimilar among patients and surgeons, but one thing that they are unanimous about is that beauty is an universal wonder [9]. It might be a bitter pill to swallow, but beauty is *power* and it is an unquestionable scientific fact that is applicable to both men and women [10].

A person’s beauty does increase his/her satisfaction/happiness, with effects that are not trivial [11].

Hamermesh and Abrevaya [11] observed that among both men and women, up to half of the increase in satisfaction/happiness resulted by beauty is indirect. In fact, better-looking people get more desirable educational, health, and labour-market achievements and perform better in marriage market [11].

Due to individual’s aesthetic judgement or “aesthetic sense”, the overall image of beauty varies [12]. Anthropological studies demonstrated that the experience of beauty is common in all cultures, but may be described differently in different cultures [13]. The concept of beauty has certainly evolved over the years, now a wider variety of skin colours and inclusion of older age groups is represented among those deemed to be the most beautiful [14, 15].

Perception of beauty is one of the primary challenges in aesthetic psychology. Human mind is wonderful and mysterious, it has been recently demonstrated that even blind individuals are able to perceive beauty [16]. There is some kind of power arousing from pretty individuals that goes beyond the visual stimuli. Nevertheless, the appraisal of attractiveness requires conscious awareness [17]. Based on few studies done by some psychologists and economists, attractive people earn more money and are

materially wealthier, and because of that are happier people in comparison to others [10].

The aesthetic theory tells us that mental pleasure can be stimulated by natural, artistic, and moral beauty [18]. Human beauty perception drives the natural selection to optimize reproductive success and it is an evolutionary necessity [10].

Perception of beauty can influence the manner in which one's personality is judged, regardless of the actual personality traits of the individual. In one of the very first studies in this area, a group of people rated pictures of random individuals and categorized them as good-looking, average-looking, and unattractive. Afterward, another group was asked to rate personality characteristics of the person in the photo. Results show that good-looking group of people were judged to be more kind, companionable, and interesting and appeared to have superior careers, happier marriages, and more satisfying lives [19]. According to related studies, positive perception of a person's appearance may have an impact on the viewer's mind, creating a subtle association of characteristics such as success, dominance, and extroversion with the subject [20–22].

Moreover, recent studies revealed that other factors can affect beauty perception by human mind. Emotional expression for instance can affect the perception of beauty by others [23, 24].

Mueser et al. [25] studied the possible effect of an object's sadness and happiness on beauty assessment by others, and the results showed that for the same person, the level of perceived attractiveness decreases as the object's face changes from happy to sad, demonstrating the role of emotional expression in perceived beauty by human mind. This finding is outstanding since although the object remains the same during different emotional conditions, yet perceived beauty varies greatly.

On the other hands, the reverse relationship of these variables can also be considered. It appears that attractiveness can affect emotion categorization. When it comes to detection of different emotional states on one's face, attractive faces appear to have a more favourable position, helping the observer to better understand the emotional state of the object, especially in females [26].

In a very recent study, the relation between aesthetic appreciation and attentional engagement was examined [27]. Participants in the study were asked to find a particular target in different contexts and the results showed that participants detected the target in appreciated stimuli faster than the less appreciated ones [27]. It can be inferred that human mind prefers to focus on aesthetically pleasant objects rather than unpleasant ones. As the writers describe it *“Altogether the present data might be considered as evidence supporting the hypothesis that aesthetic pleasure*

might represent an intrinsic reward allowing the system to spontaneously engage in perceptual activities maximizing informational gain” [27].

However, perception of beauty is not always a straightforward concept. BDD (Body Dysmorphic Disorder), for instance, is a disorder in which the person's perception of himself is preoccupied by non-existing or slight defects of his appearance, affecting 0.7–2.4% of the general population [28–30]. These patients often complain about imagined or minimal flaws in their face, skin, genitalia, among other parts of the body, making them feel unattractive or in severe cases, excruciatingly ugly, leading to sadness and anxiety [28, 30].

A large percentage of patients seeking for aesthetic procedures are diagnosed with BDD; therefore, it is crucial for plastic surgeons and anyone providing aesthetic services to detect BDD symptoms while screening for cosmetic surgeries [29–32]. Studies have shown that after a cosmetic surgery, the patient's symptoms have little to no improvement, because their preoccupation will be focussed on another part of their body [29, 32].

These findings lead to the conclusion that BDD is more of a mental and neuropsychiatric disease than a genuine physical defect [29, 32]. In fact, only a small percentage of BDD patients feel satisfied after the surgery, demonstrating the urgency to treat the patients mentally before any physical procedures take place [29, 30, 32].

BDD has multifactorial etiologies, consisting of biological, psychological, and sociological components; therefore, a specific treatment plan is required [29, 32]. Consequently, a combination of psychotherapy and pharmacotherapy is recommended by the cosmetic providers to avoid any unnecessary cosmetic surgeries [29, 32].

Beauty From a Biopsychological Perspective

The manner in which the human being experiences beauty has been tracked down to physiological levels. Tracking human beauty recognition processes of facial beauty has identified activities in both cortical reward region of the orbitofrontal cortex and subcortical reward region (putamen) [18]. There is one commonly described area in the emotional processing centre of the brain, located in the medial orbitofrontal cortex (OFC), in which the neuronal activity correlates parametrically with the experience of beauty, whether derived from sensory sources such as music or visual art, or stemming from subjective ones like joy or sorrow [33]. The importance of such stimuli throughout life has been manifested by the evidence that man's early experience of the feminine/maternal plays a central role in developing an aesthetic capacity [34].

Audiovisual neural pathways can directly conduct both natural and non-natural beauty realization from sensory and symbolic elements of aesthetic objects [35]. The major brain regions taking part in aesthetics are the left inferior and right medial OFC [36]. In addition to OFC, bilateral inferior occipital and frontal gyri, left medial superior frontal gyrus, bilateral hippocampus, and right putamen are involved in positively beautiful social interactions [37]. An important area for the perception of beautiful visual stimuli seems to be the occipital gyrus [37]. The superior frontal gyrus is associated with the aesthetic judgment and cognition [38, 39].

It has been confirmed that the sense of beauty heightens the spatial cognitive procedures, while the hippocampus contributes to learning and processes in memory. Nevertheless, the connection between the new stimuli processing and retrieval of past aesthetic memories is crucial [38, 39].

The involvement of OFC, inferior temporal and medial superior frontal gyrus over aesthetic judgments has been proved by Yarosh [40]. When judging something as beautiful and generating the neurological rewards by neurotransmitters such as dopamine, information from the superior temporal sulcus (STS) is passed to the third module, the orbitofrontal cortex (OFC), which includes the nucleus accumbens [41, 42]. In a trial, perceiving pictographs and oracle bone scripts as beautiful visuals, neural circuits of OFC and motor-related regions were significantly activated [43].

Neurological imaging of brain in one study and its analysis reveals that medial orbitofrontal cortex which is assumed to play a role in stimulus-reward value in human brain also responds to beauty of the object's face [44]. The mechanism of this engagement is similar to unrelated rewarding stimulus such as flavours, aromas, or even a pleasant music [45–47].

Interestingly, responses in the OFC can be further enhanced by a smiling facial expression [44]. Golle et al. [48] investigated the interrelationship between attractiveness and happiness; the authors observed that the evaluation of attractiveness is strongly influenced by the intensity of a smile expressed on a face and facial attractiveness also influences the evaluation of happiness: it was easier to choose the happier of two faces if the happier face was also more attractive. These findings [44, 48] testify the importance of the brain's reward system in the perception of beauty.

Beauty of the Face

The face is the first anatomical region noticed and evaluated by people. Consequently, the study of the components and geometries of the face is essential for understanding an aesthetic-surgical point of view for the improvement of its shape and proportions [49, 50].

In order to analyze facial beauty, several empirical methods have been proposed. In a recent article, Bueller described classical models of facial proportions and relationships, suggesting objective measurements of facial beauty and symmetry as guidelines for structural modification, when indicated [51]. The *circles of prominence* theory of Young suggests that the iris width may determine the ideal anatomy of many aspects of the face [52].

The attractiveness of the face has been suggested to change people's behaviour. Wang et al. observed that subjects tend to be more honest and conforming to moral codes when meeting with a person with an attractive face [53].

Symmetry is also an important factor in facial beauty. Having a highly symmetrical facial features is considered more attractive in both genders [54, 55]. Also, external factors such as scars, pollutants, and pathogens which undermine facial symmetry have negative influence on perceived facial beauty [56]. Evolutionary speaking, to maintain facial beauty and avoid negative attributes like scars in harsh environments, one must have been prominently healthy and strong, as well as having other positive attributes [57]. Thus, having a symmetrical and scar-free face may be an indicator of possessing mentioned qualities and make the possessor of them attractive and a potentially pleasant mate to procreate.

Many of these ideal aesthetic dimensions can be tracked down to ancient Greek and European Renaissance art [58].

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 is all equal, and the height of the ear equals the length of the nose [58].

The face can be divided into three equal horizontal thirds [59, 60]. The upper third is measured from the middle of the hairline (trichion) to the smooth prominence between the eyebrows (glabella), the middle third is measured from the glabella to the sub nasal (the middle site where the nasal septum meets the upper lip) and the lower third is measured from the subnasal to the inferior point of the chin (menton).

The face can also be divided vertically into five equal fifths which are the same between men and women [59, 60]. The distance between each lateral helix of each ear to the exocanthus of each eye makes up the most lateral fifths. The interval between the exocanthus and endocanthus of each eye (eye fissure length) is the other two fifths. Lastly, the middle fifth is measured from the endocanthus of each eye which has the same measurements of the width of the nose. In addition, the width of the mouth is 1.5 times the width of the nose.

Cultural differences play an important role in these measurements and may vary by ethnicity [59, 60, 61]. For instance, the middle horizontal third in white individuals and black males is more likely to be shorter than the upper and lower thirds, while the upper third in Chinese females is shorter than the middle and lower thirds [62, 63]. Contrarily, in black females, the upper third is longer than the other two thirds [64]. Similar differences are also seen in the vertical fifths divisions. Wang et al. [65] demonstrated that North American white patients have a greater ratio of mouth width to nose width, while as Han Chinese patients have a wider nose and a narrower mouth [65]. In black individuals though, the nose has a greater width in comparison to white individuals [66].

It is evident that there is no definitive definition of a standard measurement for any parts of the face since every culture has its own standards of beauty. For example, characteristics of beauty in the Middle East have been defined by an oval or round face, arched eyebrows, large almond-shaped eyes, defined cheeks, a small nose, full lips, and a pointed chin [67].

The beauty of the lips is very important in the overall composition of facial aesthetics and represents a key element of attractiveness [59, 68]. The shape and the fullness of the lips have a great influence on the outward appearance which has a direct impact on one's self-esteem, social confidence, and more importantly, on the elevation of self-perception of one's attractiveness [69, 70]. Similar to eyes and brows, the shape of the lips and the perioral area also reflect emotions, therefore, it plays a remarkable role in the facial aesthetics equation [71, 72].

As we previously mentioned, the face is divided into thirds: upper, middle, and lower. The lower third of the face is also divided into thirds, upper lip, lower lip, and the chin, and individual measurements for each part have to be considered to achieve the desired outcome [68].

The golden ratio of the height of the upper to the lower lip height is 1:1.6, the distance between the superior edge of the upper lip to the subnasion point is 18–20 mm, and the distance between the inferior edge of the lower lip to the chin is 36–40 mm [68, 73, 74]. Cultural differences also play a key role in the ideal ratios for the lips, as the ratio of 1:1.6 is more suitable for Caucasian faces, while a ratio of 1:1 is more suitable for African faces [68]. In another study on white women, the upper to lower lip ratio of 1:2 was rated to be the most attractive, while the ratio of 2:1 was rated the least attractive [59, 75].

Beauty of the Body

Physical attractiveness is one of the first things noticed when meeting someone and has a great influence on how the person is judged [76–78]. Human beings have always

strived for developing techniques aimed to measure and describe the beauty of a human body [76, 79].

From a pure evolutionary perspective of beauty, physical marks of youth and health are the most important determinants of beauty in almost every culture, indicating superior fertility [56]. One of the key indicators of physical attractiveness is bilateral symmetry. Studies on animals suggest that the animals with higher symmetry levels are more successful in finding a mate to procreate than the ones with lower symmetrical appearances [80]. It is plausible that bilateral symmetry is a sign of capability of having successful reproduction [56]. Visual symmetry is also important in humans when it comes to choosing a potential mate.

Physical beauty is also highly associated with youthfulness. Keeping in mind that evolutionary theory suggests that possessing traits which are tied with procreating are perceived as attractive [56], the duration of keeping these traits can also have a role in physical beauty. Fertility in both genders is a limited time in human's life, and youthfulness is the indicator of this period of productive potential [81]. Although men also have a limited period of fertility, but findings suggest that youthfulness is a more important factor in the eyes of men than woman, and women do not value youthfulness as much as men do [81].

Since ancient Greek times, identifying ideal body proportions was one of the most important subjects in the works of philosophers and artists. Several attempts to establish the perfect body ratios were made among ancient Grecians, and eventually, a common system of judging body attractiveness was formed (Fig. 1). This system utilizes head length (HL) as the reference criteria and measures other proportions in relation to it. Based on this system, the ideal length starting from the top of the head (TH) to shoulder line and pit of neck is $1\frac{1}{3}$ HL, to bust line is 2HL, to waist and elbows line is $2\frac{2}{3}$ HL, to hipline and wrist is $3\frac{3}{4}$ HL, to knees line is $5\frac{9}{16}$ HL, to ankles is $7\frac{1}{2}$ HL, and to balls of feet is $7\frac{1}{2}$ HL [83]. These efforts demonstrate that since the very ancient times, people strived to convert the sense of beauty into measurable proportions, in order to judge a person's beauty in a more reliable and unified manner.

About 500 years ago, the Italian artist/scientist Leonardo Da Vinci represented the ideal human body proportions in the famous drawing “the Vitruvian man” (Fig. 2).

The drawing (ink on paper) shows a man in two superimposed positions with his arms and legs apart and inscribed in a circle and a square. Leonardo was one of the first scientist who deeply studied human anatomy and his contributions to this subject were very important for the future discoveries in human anatomy and proportions.



Fig. 1 The Venus de Milo, 130–100 BC [114]. Attributed to the sculptor Alexandros of Antioch. The statue is believed to depict Aphrodite, the Greek goddess of love and beauty. It is a marble sculpture, 203 cm (6 ft 8 in) high. It is currently on permanent display at the Louvre Museum in Paris. The statue is named after Aphrodite’s Roman name, Venus, and the Greek island of Milos, where it was discovered.

There are many characteristics of a beautiful body which can be discussed individually. The body size and shape play a great role in determining the health and attractiveness of human bodies [84]. There have been many studies about body mass index (BMI), and it has been shown that a low BMI of approximately $18\text{--}19 \frac{\text{kg}}{\text{m}^2}$ in female bodies [85] and a BMI of approximately $26 \frac{\text{kg}}{\text{m}^2}$ in male bodies [86] are the most attractive. A lower BMI for female bodies is preferred by both genders, when attractiveness and health are considered [87, 88].

WCR (waist to chest ratio) is a factor that is generally measured [86]. The amount of fat and muscle mass in male

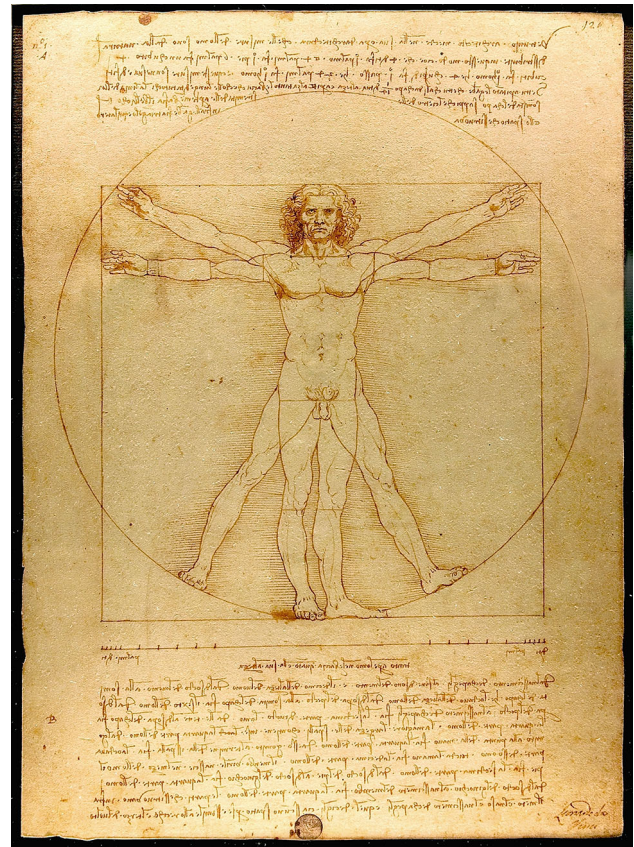


Fig. 2 Vitruvian Man [115] (or Canon of Proportions). Leonardo da Vinci; year c. 1490; Pen and ink with wash over metal point on paper. Gallerie dell’Accademia, Venice, Italy. Da Vinci tried to demonstrate the ideal human body proportions with this piece of art. He was inspired by the work of Vitruvius, an ancient Roman architect who priorly attempted to define ideal body proportions in this form.

bodies is similar in both an attractive and healthy body, while in female bodies, rather than the muscle mass, fat mass is evaluated [89].

Gluteal region is one of the most important features in a human body and worthy of attention when “beauty” is discussed. When it comes to a person’s opinion about sensual and attractiveness of another person, the shape and dimensions of the buttocks play a decisive role in the matter [90–96]. The buttock is analyzed from multiple angles. From the posterior view, which is said to have the most influence on the perceive of attractiveness of the buttocks, [97] a WHR (waist to hip ratio) of 0.75 in females and 0.85 in males was determined as most attractive, while from the lateral view, a WHR of 0.7 in females was most appealing [97, 98]. Another criterium that is considered is the ratio of DWS (dorsal width superior) to DWI (dorsal width inferior) which is 0.85 as the most attractive quotient for men and 0.75 for women; moreover, LWS (lateral width superior) to LWI (lateral width inferior) also plays a role in the matter of beauty and is 0.7 for both genders as the most attractive quotient [98].

In several articles, two groups of characteristics which describe constructing basis of beautiful buttocks were defined [91, 92, 99, 100]. Robert et al. [99, 100] described it as: 1. an even and soft concave curve of the lumbosacral and waist, 2. a feminine division as buttocks discrete, 3. maximal protuberance of buttocks in the middle to upper area, and 4. slightest infra-gluteal fold [99, 100].

On the other hands, Cuenca-Guerra and Lugo-Beltran, [92] and Cuenca-Guerra and Quezada [91] defined beautiful buttocks as: 1. a lateral degradation, 2. an infra-gluteal crease, 3. supra-gluteal indentation, and 4. a V-shaped groove.

The thigh width is another feature in the body that plays a significant role in the beauty of the perfect body. “The lollipop deformity” or “marshmallow on a stick” is phrases used by some cosmetic surgeons when enhancement of the buttocks and lateral hips is taken place without amending the thighs, which leads to an unbalanced appearance, thereby, resulting in an unattractive overall shape [101]. The thigh to buttock junction has been observed by Vartanian et al. [101], as follows. An angle of 170 degrees (the widest thigh base) is most attractive from the posterior view, while an angle of 110 degrees (the slenderest thigh base) is referred to as the least attractive [101]. A definite and specific angle degree has not been calculated for the lateral view of the thigh to buttock junction, since an immense group of preferences was perceived [101]. The thigh to buttock ratio has also been considered, concluding a ratio of 0.8 as the most and a 0.7 ratio as the least attractive [101]. In conclusion, a wide and thick thigh along with a flawless transition from buttocks to thighs results in creating the most attractive shape [101].

Leg length is also a key factor when “beauty” is discussed. A high LBR (leg-to-body ratio) has a parallel effect on females’ reproductivity potential [102] and can be affected by the environment where an individual was raised in [103]. Attractiveness of leg height is studied in both genders separately. Mentioned studies indicated that higher-LBRs in females and lower-LBRs in men are considered as the most beautiful. Nevertheless, an average LBR in both sexes is claimed to be the most attractive [103].

Beauty of the Breast

Breasts, as a symbol of fertility, have a significant role in creating a beautiful and attractive body [9]. Breast surgeries are more referred to as an art rather than science, since the breast is the most deformable organ in female bodies and making it very complicated to evaluate its morphology [104, 105].

Four main characteristics have been defined for a breast shape to be able to be categorized as an attractive breast and departure from these criteria results in an unattractive appearance. They are described as follows by Mallucci and

Branford [106]: 1. the upper to lower ratio, or so-called the 45:55 ratio, is such that 45% of the breast is made up of the upper pole, while the remaining 55% is made up of the lower pole, 2. the nipple is located at the cutoff point of the upper/lower pole and is pointing upward, 3. the gradient of the upper pole should preferably be a linear line or gently depressed, 4. the lower pole is an even rounded curve [106]. Deviation from the mentioned criteria will have a detrimental effect on the beauty of the breast [106].

On the other hands, another quantification for the perfect breast shape was proposed by Swanson [107] and consists of 6-dimensions of the breast: 1. breast protuberance, 2. upper pole protuberance, 3. lower pole level, 4. lower pole length, 5. lower pole width, and 6. nipple level [107].

Furthermore, it has been mentioned that the lower pole ratio of 1.73 is an ideal proportion, while any values greater than 2.0 seem to be unattractive [9].

Regarding the breast volume, according to Western media, women consider having larger breasts as an endowment, and men usually prefer that their partners have sizeable breasts [108]. This preference has been related to the breast’s functions of milk/fat storage, breast-feeding, mechanisms of heat stress avoidance, and to the woman’s ovulatory potential/successful conception [109–111].

Nevertheless, recent studies examining men’s preferences of their partners’ breast size brought about different insights: some studies have suggested that men have a preference for small breasts, while other studies have reported a preference for medium or large breasts [110, 111].

Prantl and Gründl [112] observed that the majority of women consider a medium-sized breast as the ideal size, while men prefer a relatively larger size.

Breast-by-body size relation is also significant. Raposio et al. [113] suggested that plastic surgeons should not simply focus on breast size, but should also consider the proper size of the breast in relation to the whole body, in order to address the patient’s expectations.

Nonetheless, disregarding any trends and ever-shifting norms, it is evident that breasts have always played a decisive role in the overall beauty of women, and consequently, received tremendous attention throughout history.

Models of Beauty

Striving for beauty is a universally agreed-upon fact, from ancient times back to the present. Although the symbol of beauty varies in different cultures, countries, eras, and ethnicities, whether an individual is deemed beautiful or not and is a unanimous opinion [13, 40]. For instance, Angelina Jolie and Brad Pitt are probably considered as the symbols of beauty in the current century (Fig. 3).



Fig. 3 Angelina Jolie (left) and Brad Pitt (right), very famous and popular American actors [82].

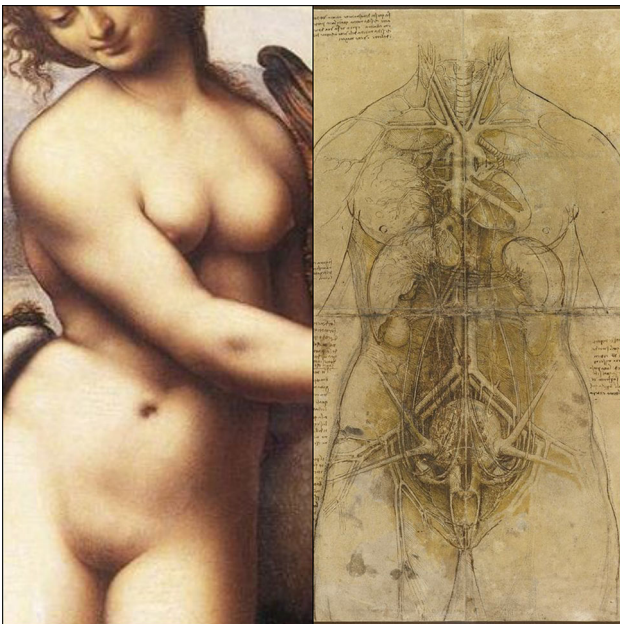


Fig. 4 Left: Particular of the painting “Leda and the Swan”, by Leonardo da Vinci, 1505–1510; museum Boijmans Van Beuningen, Rotterdam, the Netherlands. In the Greek mythology, Leda was so beautiful that her beauty attracted the attention of Zeus. Zeus transformed himself into a beautiful swan and descended to seduce Leda. Right: Leonardo da Vinci. The Vascular, Respiratory, and Urino-Genital Systems of a Woman, 1509–10; The Royal Collection, UK.

Nevertheless, 500 years ago, human beauty concept was very different, as it is shown in Leonardo da Vinci’s “Leda and the Swan” painting (Fig. 4, left). It is evident that the concept of beauty has altered over time. Many philosophers alongside scientists, artists, fellow enthusiasts, and most recently plastic surgeons have attempted to comprehend

the different models of beauty from their own point of view.

A common inaccuracy that has been along since the 15th and 16th century, and reflected in the mindset of artists like Leonardo da Vinci [116, 117] and today’s plastic surgeons, is that beauty and aesthetics are defined and evaluated by mathematical ratios and linear/angular parameters, dismissing the cultural and ethnical dissimilarities [116, 118, 119]. Nevertheless, the importance of these factors has to be contemplated for aesthetic evaluation, since the individual’s perception of beauty is directly related to their cultural and ethnical backgrounds [119–122], therefore, it is safe to say *which beauty lies in which beholder’s eyes*. [119]

Nowadays, the common standard of beauty in the eyes of most people is described as a thin and linear body, flawless face features, and smooth skin, among others, [123, 124] but recently, some individuals are trying to break these norms and show the world that anybody can be beautiful even with deficiencies and flaws. [125] They have shown that people belonging to different genders (female, male, LGBTQ, others), body sizes (thin, fat, obese), skin colours, skin conditions like vitiligo or albinism, or people with disabilities might be considered beautiful and there should be no hindrance for anyone to not feel or be seen beautiful.

The underlying reality is that at the end, we are all skin and bones with similar internal organs (Fig. 4, right).

Surgeons have the opportunity to see human bodies from a different and privileged standpoint. Not only they can see the exterior beauty, but they can see what beauty lies inside the human body. So, if you ask him/her about the beauty of a human body you might be surprised.

Like a wise elder who has seen the world beyond external appearances, the surgeon is the bearer of privileged knowledge on this subject.

Beauty and Cosmetic Surgery

Cosmetic surgery is performed on normal (and not necessarily defective) body structures in order to improve the appearance according to the patients’ desire, alongside with the implication of amplifying their self-esteem [126, 127]. Cosmetic procedures are meant to alter dimensions, angles, structures and in general all the components of the physical appearance, in order to meet the desired proportions of the patient’s mind. The best gift that plastic surgeons can give is to promote the inner confidence of their patients in order to make them feel more confident and live a happier and more satisfactory life [10].

A very common reason that rises the urge for cosmetic surgeries is facial ageing and the consequent mental

discomforts related to it. Younger women mostly worry about signs of tiredness and dark circles around their eyes, while women in their thirties complain about wrinkles, loss of tonicity of the face, and beginning of slackening of their neck from the age of 45. Minimally invasive cosmetic procedures such as botulinum toxin injections, dermal fillers, laser, chemical peels, and mesotherapy are commonly used among women to address the mentioned concerns.

Although cosmetic procedures have been done for a long time, there are still concerns about the impact of such procedures on the public perception of the people who undergo these aesthetic medicine procedures or surgeries. Research has shown that the perception of one's appearance can directly influence the other people's judgment of the person's personality [21, 22, 128, 129].

Recent researches examined the impact of facial cosmetic surgeries on both women and men [130, 131]. According to a study that focussed on the impact of facial cosmetic surgery on women's perceived personality traits, such procedures improve the perception of likeability, social skills, attractiveness, and femininity of the patient by others [130]. Another research that evaluated the impact of facial cosmetic surgery solely on men, reached a similar conclusion [131]. This study suggests that although not every cosmetic surgery may lead to enhanced perception of patient's traits, most of facial cosmetic surgeries impact the perceived characteristics of the patient positively. Attractiveness, likeability, social skills, and trustworthiness of the patient improved [131].

A few studies [132, 133] attempted to cast light on the ulterior roots of cosmetic surgery, by showing that patients who are willing to undergo a cosmetic surgery, have higher dissatisfaction with at least one part of their body image.

The relation between one's body image and his self-esteem was called *body image valence* [134], and the degree of perceived body image dissatisfaction was called *body image value* [134]. Expectedly, the combination of higher levels of body image valence (tie between self-esteem and body image) and higher levels of body image value results in a more probable attempt to have a cosmetic surgery, and lower levels of body image valence and body image value usually lead to not seeking cosmetic surgery [134].

Conclusion

The concept of beauty has mesmerized human minds since the very early days of history, and as the humans developed over centuries, they have attempted to discover new aspects of this phenomenon, as demonstrated in the works of many people; from Plato to Da Vinci, pursuit of beauty and the desire to unlock new mysteries remains constant. Different

aspects of beauty, from intellectual to pure physical, have received a tremendous amount of attention. Endeavours that took place in this path have led to significant progress in establishing criteria to define beauty from different points of view. Although beauty is a very important concept and the seek for achieving it is a very natural behaviour, one must remember that the importance of beauty should not overshadow the fact that every human being is made up of similar internal organs.

We strongly encourage the reader to look beyond the hedge, to be aware that each of us is made up of internal organs (Fig. 4). The reader should reflect on this, in order to be able to "see" beyond the integument that surrounds the body, when he/she will look at the next person.

Declarations

Conflict of interest The authors declare that they have no conflict of interest to disclose.

Human and Animal Rights This article does not contain any studies with human participants or animals performed by any of the authors.

Informed Consent For this type of study, informed consent is not required.

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