

ARTISTIC ANATOMY

Ali Yilmaz

*Department of Anatomy
Faculty of Medicine
Trakya University
Edirne
Turkey*

Corresponding Author:

Ali Yilmaz
Department of Anatomy
Faculty of Medicine,
Trakya University
Edirne
Turkey

e-mail: aliyilmaz@trakya.edu.tr

Summary

The artists, who use the human body as a narration symbol, had investigated the human anatomy by the vision of artistic anatomy throughly. They had accepted their work of arts have some proportions on human body. And they had used these proportions in their lots of evidence. The proportions between the different parts of the human body had been called CANON. And the unit measure of every canon had been defined as MODULE. Artists had used different modules like foot length, hand length, head height and third finger length in different canons. The most olden canon which is in Egypt, accepts the foot length as module. From their graves and not-ended pictures in pyramids, we understand that the height of the human body is equal to six times of the foot length. But on the new Egyptian Canon, the module is the third finger length of the hand. As humanity history develops, lots of artists had defined different canons in their own cultural and social comprehension. Leonardo thought that God geometrized the human. And he used mathematics while he was searching the mystery of the human body. Da Vinci maintained that there are lots of equalities on the human body despite he didn't use any modul. Durer used geometry and perspective in his studies. And he is the first scientist who maintained the proportions of the human body do not change person to person. He had got lots of studies about the subject. Dürer did not use any modul in the described canons like Leonardo too. But he talked about lots of proportions.

Key words: canon, proportion.

The science that analyzes the sizes and the proportions of the human body in visual arts like painting and statue is called "Artistic Anatomy". Turkish correspondence of this term derived from the word "ars;artis" (art) in Latin is "Artistic Anatomy". While the French and the English use the expressions "Anatomie Artistique" and "Artistic Anatomy" respectively, the German and East European countries under the influence of the German prefer the statement "Plastische Anatomie" (Plastic Anatomy). The description of "Aesthetic Anatomy" (Gr. Esthetica=beauty) has frequently been used recently with the rapid development of plastic surgery. Nonetheless, this statement is less comprehensive and preferred for proportions of face with surgical cases [1, 2].

Artistic Anatomy named as a science emerged just in the 19th century although it as content dated from very old ages. The leadership of French cult in this field has been admitted by everybody. The most comprehensive studies are the books entitled "Nouvelle Anatomie artistique du corps humain - l'Homme" (New Artistic Anatomy about

Human Body Male) published by French painter-doctor, Paul Richer in 1906, in the first years of 20th century and “Nouvelle Anatomie artistique la Femme” (New Artistic Anatomy- Female) published in 1920. Richer, who called Artistic Anatomy as a science by means of anthropometric and statistic research methods, revealed concrete data about proportions of body reflecting “average European person” [3].

Proportions of Human Body

The ratio among various sections forming human body is called proportion (Lat. pro+portio= the relationship of sections) in visual arts. The unit of rules describing average proportions of human body is also called “canon” (Gr. canon=rule, law) in science and art. Lots of canons were composed in the history of art and so many artists also created a number of works of art within this unit of rules. In addition, they used some units of measurement in these works of art concerning human body. The unit of measurement chosen to get harmony among the sizes of building elements or to set the proportions and sizes of body is called “module” (Lat. modulus =criterion) in Artistic Anatomy. While anthropologists and archaeologists are determining the proportions of human body, they usually prefer the bones as immobile, permanent and imperishable components (they express their opinions about the person's proportions according to the bones taken out of the graves). However, the artists take any piece of alive human body as “unit of measurement” (module). The most important component of a “figure” (Lat. figura=form, format, stature) is mainly body height. The lengths of head, body and extremities could be proportioned to among themselves as much as to the whole body height. Moreover, the parts of extremities (arm- forearm-hand; thigh- leg- foot) could be amounted based on each other. On the other hand, in the width measurements of the body, shoulder, thoracic cage and hip sizes are considered according to both each other and vertical lengths. Sagittal diameters (depth) and girths (circumferential) are the least examined subjects in artistic anatomy [1, 3].

Head and face sizes have a special significant either in portraiture or in plastic, reconstructive and aesthetic surgery. Thus, it became a specialized lateral branch of Artistic Anatomy. There have been a number of researches done and issues under the name of “neoclassic canons” in the application-oriented and commercial subjects recently [4, 5, 6, 7].

Ancient Egypt Canon

The first module used by Egyptians drawing figures with linear lines onto the stone walls of temples was “foot length”. In this proportion known as “Ancient Egypt Canon” today, the height equaled to 6 foot length at first. Egyptians gradually noticed that this proportion did not reflect the reality and made body height equaled to 7 foot length by tending towards longer figures. However, they attempted to search different modules when they recognized that this

proportion was also not realistic [3].

New Egypt Canon

In “New Egyptian Canon”, which is more perfect in human descriptions with the contribution of Alexandria science center, “middle finger length” of hand was chosen as a module and its proportion to height was determined as 1:19. In graves and temples descended from that period, figures were seen to fit into checked boxes or between 19 horizontal lines. Foot length in this canon takes up 3 boxes, that is, Egyptian artists realistically fixed 19:3 (6,33) proportion as fractional number any more (Figure 1)

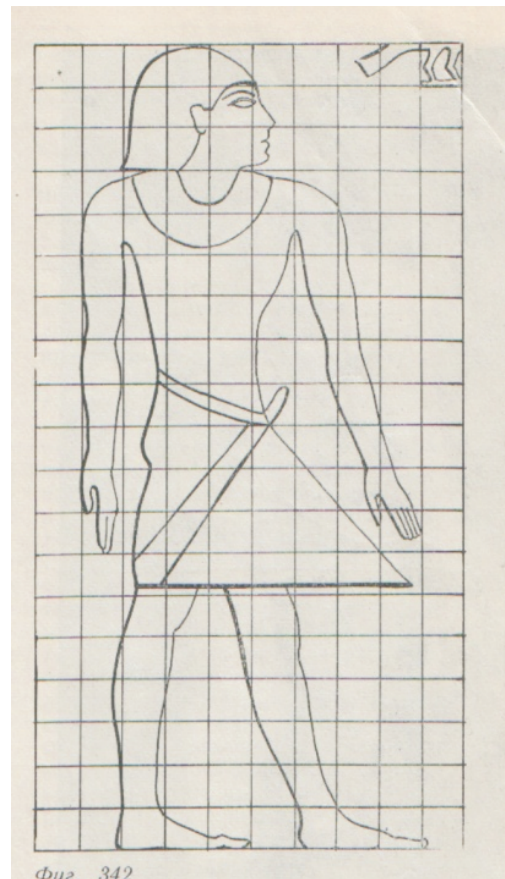


Figure 1. Egypt canons

Greek Canon

Plastic arts of Helens were affected from Egypt. It is also possible to see 19 square rules in their works of art. Polykleitos, who is well-known sculptor of classical age, examined human body and wrote the first artistic anatomy book known in the history. Human's body proportions and personal opinions were involved in this analysis which has not reached today. The artists following him continually dealt with “Policlet theory” and mentioned it as basic work. Polykleitos chose “hand width” as a module. He determined the other body parts by making use of this module.

Furthermore, he defined several equalities;

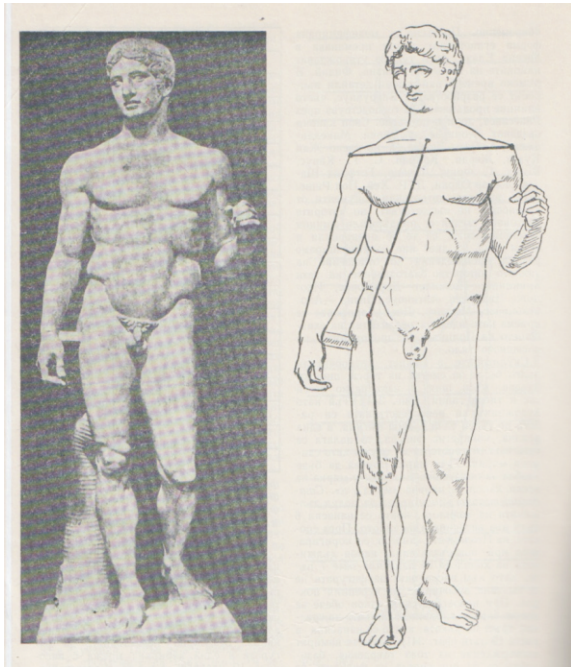


Figure 2. Polykleitos equalities

basion- midpatellare=midpatellare-“collum femoris”= collum femoris”- suprasternale = shoulder width (Figure 2). “Collum femoris” point is an artistic description and defined as the point over two fingers of Trochanterion anatomically. Multiple indexes of equalities were firstly created among longitudinal, oblique and transversal dimensions. Thus, an extraordinarily fascinating, strong and healthy figure was introduced [1, 3].

Rome Canon

Roman architect, Vitruvius (Marcus Vitruvius Pollio), who lived in the first century A.D., wrote an architecture encyclopedia (“De re architectura”). He focused on the relationship between the proportions of human body and architectural works in this book while he was describing all types of temples and buildings on wide lands in Roman Empire. According to this description known as “Vitruvius square” (or “The Square of ancient age”) human figure in arm span position could be placed in the frame of square. That is, arm span equals to body height. In this square, head height based on total height is $1/8$, face height is $1/10$; the distance between Vertex and incisura Jugularis is $1/6$, between Vertex and Mamilla is $1/4$. The midpoint of body ($1/2$) is bottom edge of symphysis pubis. On the other hand, the distances equal to $1/4$ body height are: basion - infrapatellare and elbow - the third fingertip. Foot length was accepted as $1/6$ body [3, 8, 9].

Leonardo Canon

Leonardo da Vinci, who is an all-round and creative person, added his own circle to “Vitruvius square”, which is a very popular one, and created his famous drawing (“Vitruvian man”). In this drawing which is

regarded as a universal symbol of artistic anatomy, arms were raised up to “vertex” level, legs were moved away from each other as about 60° angle. In this case, hand fingertips and soles touch on a circle with “navel centric”. Leonardo also depicted the other proportions that he believed in this drawing: Sole - Apex patellae = $1/4$ height; Sole - Subpubis = $1/2$ height; Sole - Mamilla = $3/4$ height; Sole - incisura jugularis = $5/6$ height; Sole - Basis nasi = $11/12$ height. However, horizontally “Midline axilla width” = $1/8$ height was demonstrated. According to Leonardo, foot length equals to hand length plus wrist thickness. If the elbow was bended, the distance between “acromion and olecranon” would be equal to $1\frac{1}{2}$ head height and at the same time olecranon - 3. metacarpophalangeal articulation. This equality in the history of art was called “Leonardo equality” [8, 10, 11]. According to Leonardo, hand width also equals to foot width. On the other hand, hand length equals to the distance from malleolus medialis to foot finger tips.

Dürer Canon

Albrecht Dürer, who is the most significant representative of North Europe Renaissance, wrote 4 books about the proportions of human body. The first of these was published while he was alive and the others were published after his death.

Dürer dealt with the proportions of female figures in his first book and demonstrated each of them in three positions by creating types in 1:7, 1:8, 1:9 and 1:10 head/ height proportions. In his second book, he analyzed the details of human body and described 600 parameters. In his third book, body proportions were examined by means of original mathematical methods and the differences among proportions were based upon mathematical formulas. In his fourth book, he discussed physical movements and perspective views and consulted to square-boxes method just as the Egyptians did [3].

Dürer designed head/height value as 1:8 and put the midpoint of height below the glans penis. He arranged body proportions based on foot length as 1:6: adopted “vertex - incisura jugularis” as the first module; equated the second module with the width of thoracic cage and drew square on the chest. However, the circle inserted into the corners of this square hit the point of navel below. The circle with navel centered and one-moduled diameter, on the other hand, hit the point of symphysis. He carried out similar studies for Eve figure and revealed the differences between female and male figures. For instance, thoracic cage was fitted into the rectangle not square, the midpoint of height was over symphysis, femur was shorter, but leg rate was bigger. Dürer also wrote numeral rates in a schematic drawing. According to body height, head is 1:8, face height 1:10, “vertex- incisura jugularis” 1:6; “vertex-mamilla” 1:4; “vertex-symphysis” 1:2; biacromial diameter 1:6; bideltoid diameter 1:4; foot length 1:6; foot width 1:16. Dürer firstly grasped that other proportions changed depending upon body

height. Furthermore, he adopted 1:8 canons for “small-headed” models; 1:7, 5 canon for “big-headed” models [3, 12, 13].

Other Renaissance Canons

Many painters and sculptors left thousands of works of art by studying on those in the 15th and 16th centuries involving Renaissance period. These works enriching the museums of the world have still aroused admiration among the watchers. All of these artists as mentioned encountered a problem of proportions while describing human body and some of them wrote theoretical thoughts out on the subject.

Jean Cousin (1490-1560), who is the significant representative of French Renaissance, described “Cousin Canon” that bears his own name and it was studied in French academies of fine arts for a long time (14). His module, for instance, is “quarter head” (1/4 of head height) height. Nevertheless, this canon was forgotten as the time went by because the points he used were not reliable and they presented striking rates. Gerard Audrane (XVI yy) tried to measure antique sculptures and depicted various types in those: type of power- Hercules; type of handsome - Meleagros; type of divine- Apollon; type of elegance- Venera Medici.

Giovanni Paolo Lomazzo (1538-1600) wrote a book about proportions including 7 volumes in Milano. He chose “face height” as a module and used 1:10 (face: height) ratio. He described three equalities known as “Lomazzo equalities”: “basis-patella” = “patella-umbilicus”=“umbilicus-subnasale”. He also accepted upper extremity as 4 modules [1, 3, 14].

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