

Homo sapiens' attraction to females with low Waist-Hip Ratio (WHR)

New Hypothesis:

The attraction of Homo sapiens males to low Waist-Hip-Ratio (WHR) females during the Holocene is due to their long standing appreciation of the advantage of being able to more easily transport and protect their offspring during long periods of constant migration during the Late Pleistocene.

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The beauty of bodies:



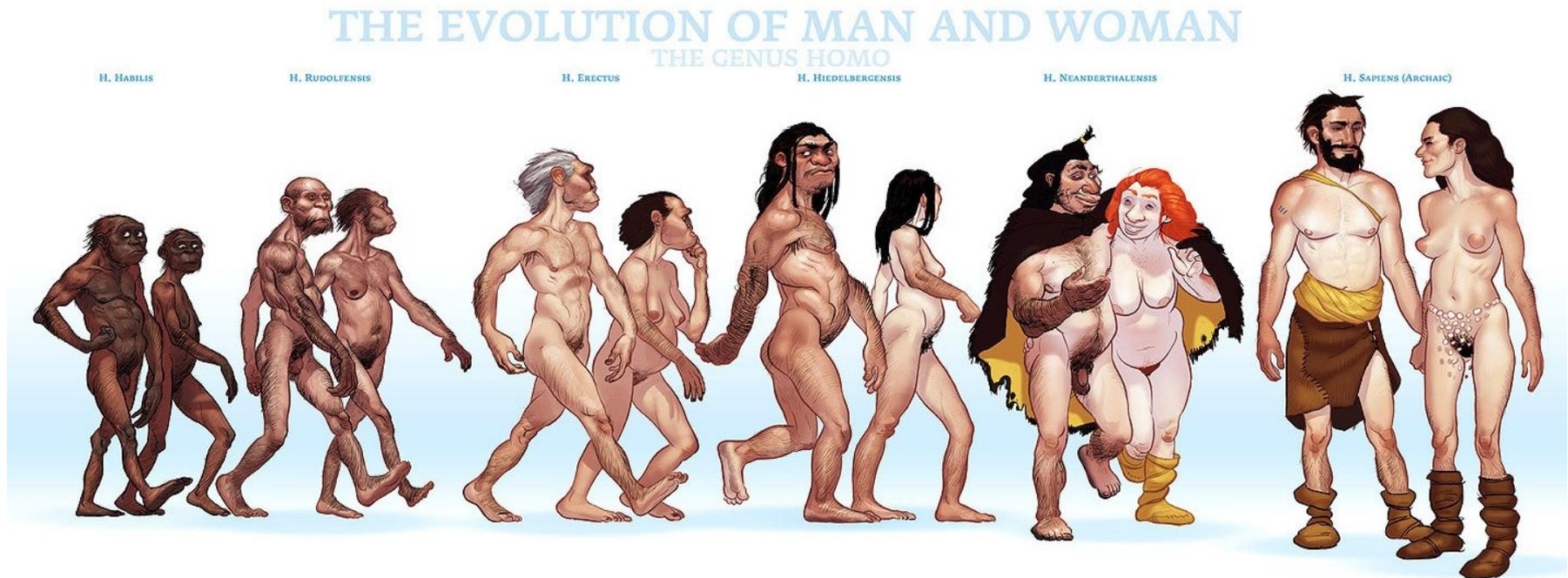
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A predominant historical view in the behavioral sciences has been that human standards of beauty are arbitrary and depend only on socio-cultural processes.

This view contrasts with evidence from non-human species that the attractiveness of an organism as a mate is linked to traits that help solve adaptation challenges related to survival and reproduction.



Evolutionary Psychology



Evolutionary Psychology is a theoretical approach in the social and natural sciences that examines psychological structure from a modern evolutionary perspective. It seeks to identify which human psychological traits are evolved adaptations, that is, the functional products of natural selection or sexual selection in human evolution.

Evolutionary psychologists argue that behaviors or traits that occur universally across cultures are good candidates for evolutionary adaptations, including the abilities to infer the emotions of others, to discern relatives from non-relatives, to identify and prefer healthier partners, and to cooperate with others.

Evolutionary Psychology suggests that a woman's sexual attractiveness is based on signs of health and reproduction.



In recent years, research has focused on the relationship between waist width and hip width, the waist-to-hip ratio (WHR). It is believed that a low WHR (i.e., a curvilinear body) corresponds to the optimal fat distribution for high fertility, so this shape should be very attractive.

Studies have also confirmed that males judge female bodies that show an optimal amount of lumbar curvature as the most attractive.



The evolutionary origins of lumbar curvature as a sign of beauty may stem from the problems faced by human bipedal females when they become pregnant. If their spines were designed like the male spines, the muscle fatigue and back pain they would face would have been considerable. As a result, the structure of the female spine has its center of gravity shifted backward, decreasing the body's stress during pregnancy, leading to improved foraging ability and other adaptive advantages.

Two important differences between Homo sapiens and the rest of the Primates.



1)- Most primates have kept their fur.

2)- This has allowed the offspring to hold on to their mothers during their displacements.

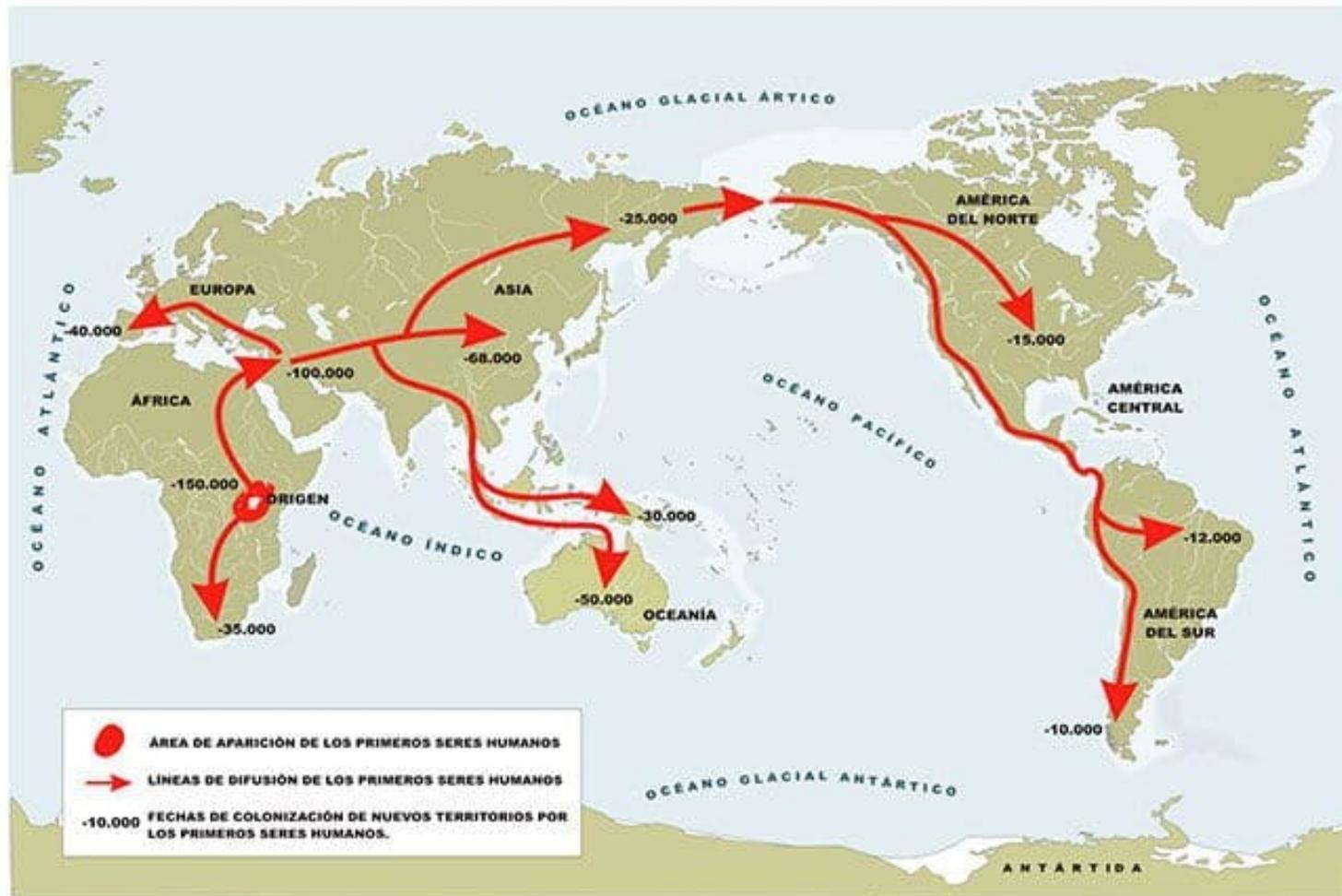
Our Homo sapiens specie is more than 150,000 years old.

Until only 10,000 years ago, it survived by hunting and gathering:



It is estimated that Homo sapiens needed to travel up to 10 kilometers a day to get their food.

Dispersion of Homo sapiens in the last 150,000 years:



Semi-nomads, walking, in 150,000 years we have populated the entire planet.

Children carried by their mothers using only the horizontal force of their arm.



We will analyze the components of the horizontal force exerted by the mother's arm, the reaction force of her body and those supported by the child.

- 1)- First case: WHR index approaching 1, that is, the waist slightly smaller than the hip.
- 2)- Second case: WHR index approaching 0.6 or waist much smaller than the hip.



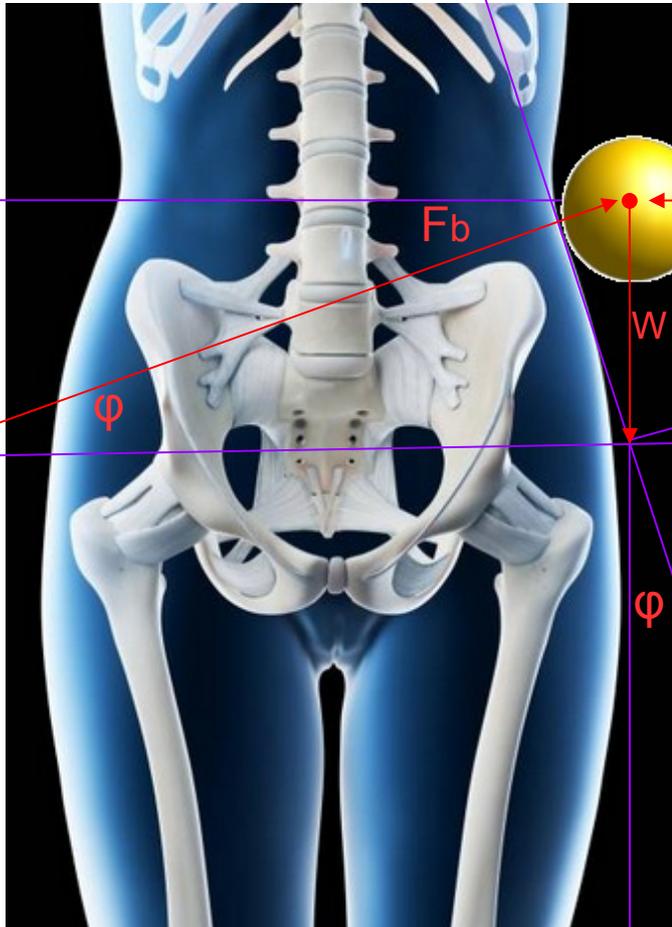
First case: diameter of the waist slightly lower than the diameter of the hip, with minimum weight distributed on the iliac crest of the pelvis:

W : weight of the infant

F_a : horizontal force exerted by the arm

F_b : reaction force of the mother's body

φ : angle of the waist surface with respect to the vertical



Knowing the weight of the infant and the angle φ , we can find the value of the other two forces:

$$F_a = W / \tan(\varphi)$$

$$F_b = W / \sin(\varphi)$$

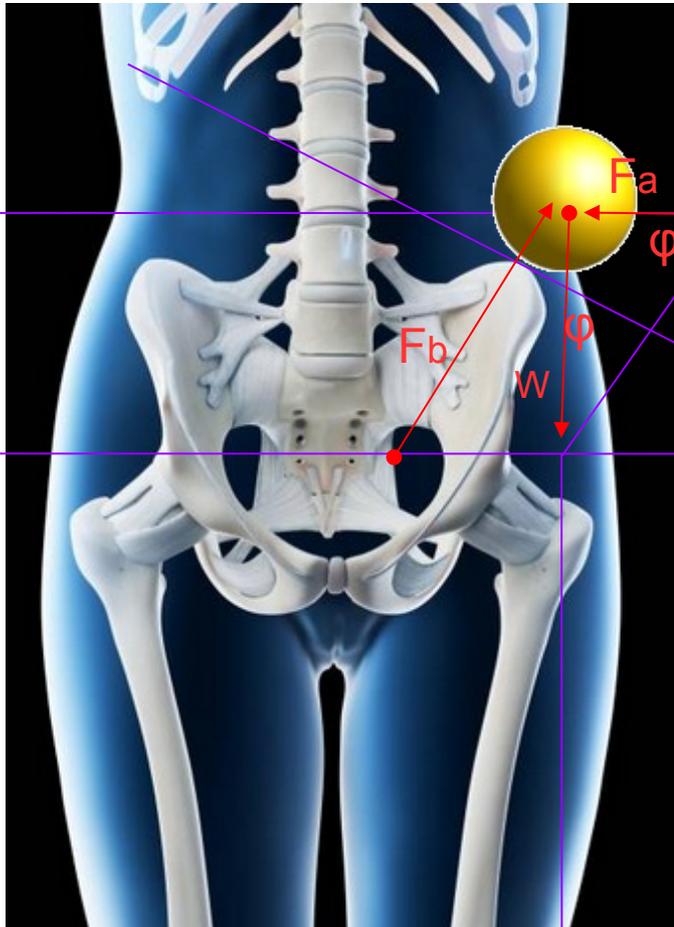
If we assume that $W = 10 \text{ kgf}$ and $\varphi = 15^\circ$

$$F_a = 10 \text{ kgf} / \tan(15^\circ) \quad F_a = 10 \text{ kgf} / 0,268 \quad F_a = 37,31 \text{ kgf}$$

$$F_b = 10 \text{ kgf} / \sin(15^\circ) \quad F_b = 10 \text{ kgf} / 0.259 \quad F_b = 38.61 \text{ kgf}$$

Conclusion: the mother exerts a force on the infant's back almost **4 times** his weight.

Second case: diameter of the waist markedly lower than the diameter of the hip, with weight distributed on the iliac crest of the pelvis:



W : weight of the infant

F_a : horizontal force exerted by the arm

F_b : reaction force of the mother's body

φ : angle of the waist surface with respect to the vertical

Knowing the weight of the creature and the angle φ , we can find the value of the other two forces:

$$F_a = W / \tan (\varphi)$$

$$F_b = W / \sin (\varphi)$$

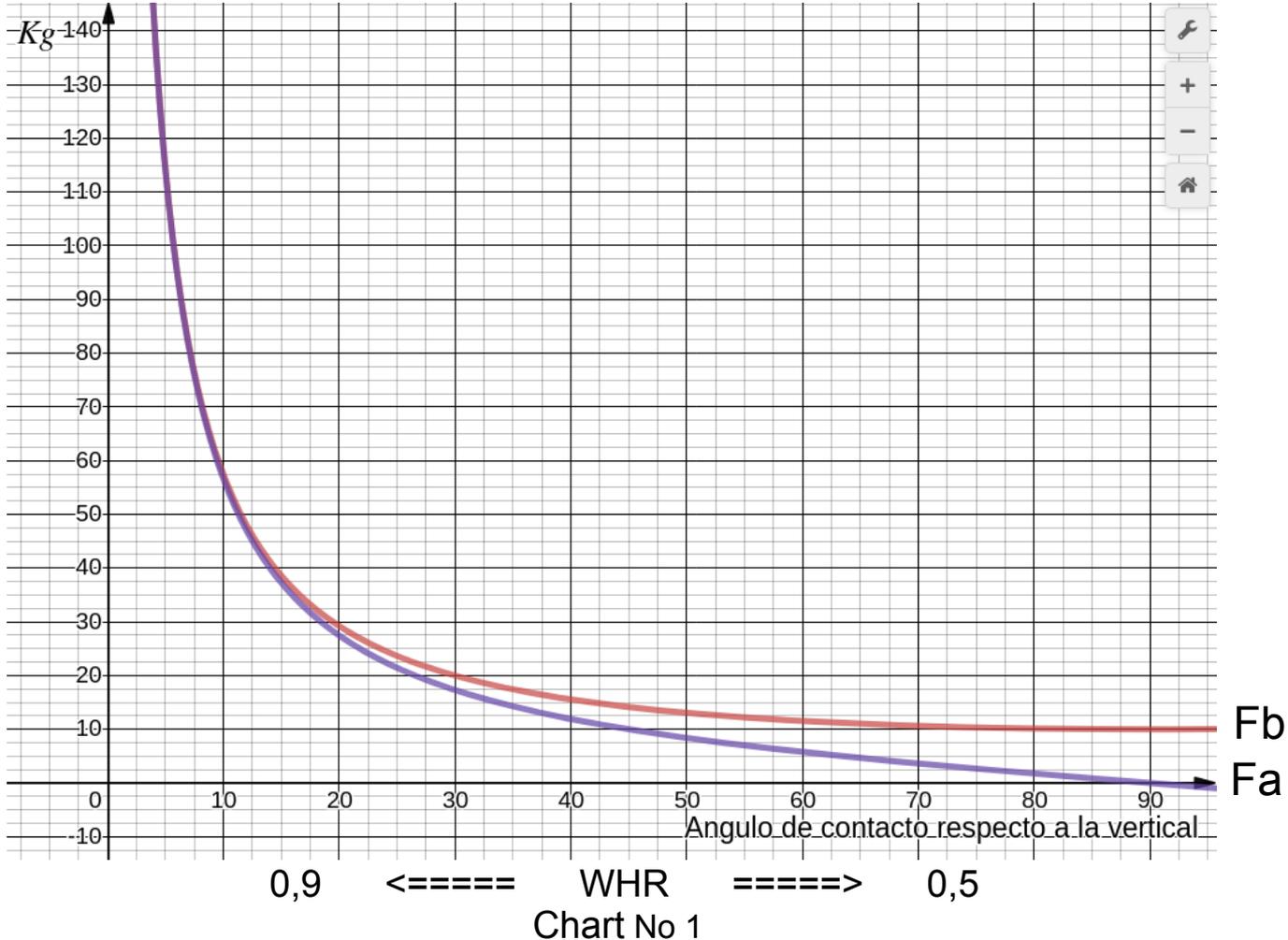
If we assume that $W = 10 \text{ kgf}$ and $\varphi = 60$

$$F_a = 10 \text{ kgf} / \tan (60^\circ) \quad F_a = 10 \text{ kgf} / 1,732 \quad F_a = 5,77 \text{ kgf}$$

$$F_b = 10 \text{ kgf} / \sin (60^\circ) \quad F_b = 10 \text{ kgf} / 0.866 \quad F_b = 11.55 \text{ kgf}$$

Conclusion: the mother exerts a force on the infant's back of only **half** his weight.

Graphing the formulas of the two forces, we see that as the child can lean more inside the mother's body and therefore the angle of contact with the vertical increases, correlating to a low WHR Index, both F_a (horizontal arm force) and F_b (body reaction force) tend to very low values. The friction forces between the bodies have been neglected.



We can conclude that as the WHR decreases, the arm's force F_a tends to 0 and the body reaction force F_b tends to the weight of the child.

Mothers with a greater difference between the waist and hip diameter will be able to carry their children with much less force and therefore consume less energy.

Very important: their children will also support lesser forces on their bodies.

Presentation of the hypothesis: "The attraction of males of the Homo sapiens specie to low Waist-Hip-Index (WHR) females during the Holocene is due to their long appreciation of the advantage of being able to more easily transport and protect their offspring during long periods of constant migration during the Pleistocene.

Hundreds are the works that have researched the relationship between the Waist Hip Index (WHR) of women and its correlation with the beauty perceived by men. It is supposed that this perception has evolutionary origins and denotes some favorable female characteristic for the survival of children and therefore, the father's genes. The vast majority of studies conclude that these favorable characteristics are located inside the woman's body such as: correct nutrition, safer pregnancies, fertility, fecundity, optimal amount and location of fat, etc.

This new hypothesis is based on the forces that appear through the interaction between mother and child when riding on her waist. It is proposed that these forces are notably modified by the relations between the diameters of the waist and the hip and their forms. Some mathematical and trigonometric calculations show this (Chart No 1). Smaller waists than hips are necessary to verify the statement since the angle formed between the vertical and the contact plane of the two bodies is essential to reduce the force that the mother's arm must exert (Law of forces in an inclined plane).

For hundred thousands years, this reduction of forces and energy saving by the mother must have been indispensable for the transport of her children in semi-nomadic, nomadic and migrations times, when humans had not yet domesticated pack animals.

We will mention that of the more than 100 primates in existence, Homo sapiens being one of them, is the only one that has lost the fur that covered his body and females have a very evident small waist. We have shown photos of how the mothers of four-legged primates transport their offspring, without the need to use any of their limbs, thanks to the fact that the offspring can hold on to the long hairs of their mothers by themselves. Bipedal Homo sapiens offspring do not have this ability. Without fur, it is very likely that the manifest small waist has been indispensable for the survival of Homo sapiens.

The possible conclusion of this Hypothesis:

- a)- The small waist of Homo sapiens women has developed by necessity by males sexual selection during the Quaternary Pleistocene (2.7 million years). The cause: its correlation with greater possibilities of survival of offsprings because of advantages to transport its young to great distances in times of shortage of foods, nomadism, migrations and also, the greater facility for mother and child to flee from the different carnivorous animals.

- b)- During the Quaternary Holocene (last 12 thousand years), Homo sapiens, the only surviving Homo specie, still appreciates and is attracted by reduced waists by an innate, instinctive and reflex vestige of preferences of ancient times, the Pleistocene.

Clarifications

In this hypothesis, the following cases were not studied:

- a) The mother carries her child by exerting an upward force with her arm

- b) The mother carries her child by exerting a horizontal and vertical force with her arm:



Bibliography

This study is directed more to the general public than to the scientific field. Therefore the sources are not cited in the text. However, during the elaboration of this document I have consulted many books, papers and related studies. I include their titles, author and year. In the case of several authors of the work, only the first one on the list.

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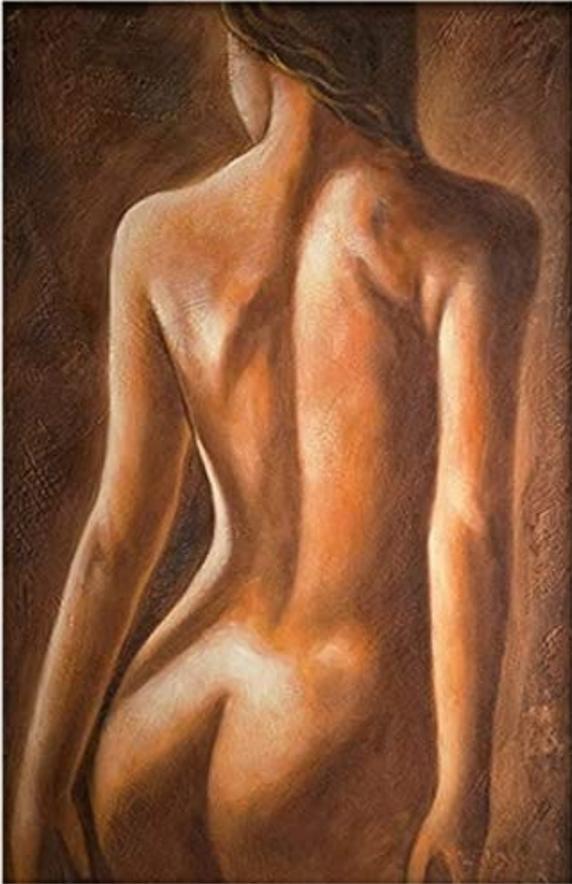
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Second new hypothesis to be developed.

Effect of lumbar curvature and abdominal cavity.



The attraction of Homo sapiens males for females with pronounced lumbar curvatures and appreciable abdominal cavity is due to their long appreciation of the advantage this characteristic confers on mothers to distribute the weight of their offspring's legs in these places when they are transported.