
Comment

Breasts, Hips, and Buttocks Revisited

Honest Fatness for Honest Fitness

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This paper comments on Low, B. S., Alexander, R. D., and Noonan, K. M. Human hips, breasts, and buttocks: Is fat deceptive? *Ethology and Sociobiology* 8: 249–257, 1987. In it I argue that:

1. Sexual selection has probably not been the most important selection pressure on female human body shape.
2. Male humans in different cultures find different aspects of the female body attractive and therefore are unlikely to have exerted consistent directional sexual selection on the female body.
3. Breast size is not correlated with lactation success.
4. Visible hip width is not correlated with parturition success.
5. Women would lower their fitness if they tried to deceive men about their internal pelvic dimensions.
6. There are many alternative hypotheses to explain the existence of fat on women's breasts, hips, and buttocks.

KEY WORDS Deception Sexual selection Fat deposition

Low et al. (1987) present two alternative hypotheses for the adaptive significance of breast, buttock, and hip fat in human females, concluding that there is a strong case for the hypothesis that it is actually a deceptive sexual signal. The assertions of Low et al. rest heavily on their underlying assumption that sexual selection has been the dominant force determining female human sexual characteristics. I question this assumption and present here a number of arguments that disconfirm their hypothesis about deceptive fat deposits in human females.

Received November 24, 1987; accepted November 24, 1987.

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HUMAN FEMALES AND NATURAL SELECTION

The reproductive energy budget of mammalian females must be divided among a number of functions—mating, gestation, parturition, lactation, and other care of the offspring. For most female mammals, the energy put into mating is very much less than that assigned to their other reproductive functions. For humans, this is also true, though the relative amount of mating energy varies from culture to culture. While industrialized North American and western European girls appear to put enormous amounts of energy into attracting men, they are unusual in both their lengthy courtship period and proportion of women who never marry (Gee 1982). In most other cultures, more than 95% of women marry (Gee 1982) with much less effort put into mate attraction. In fact, where marriages are arranged by parents, the girl's mating effort is effectively zero, the 'Kung bushmen, often thought to be representative of human ancestral populations, have this marriage pattern (Howell 1979). Like most female mammals, then, women have been historically the limiting resource for reproduction, despite the fact that men do contribute to care of the offspring.

Insofar as each aspect of reproduction implies its own selection pressures on females, selection is surely strongest on those processes involving 1) the greatest expenditure of energy or 2) the greatest effect on fitness. Mating effort, for nearly all human females, satisfies neither of those conditions. It is probably a mistake, therefore, to assume that a female reproductive structure is adapted chiefly for attracting males, as Low et al. (1987) have done. Attraction of males may well be a beneficial effect of a sexual structure like the fat deposits they discuss, but it is unlikely to be their adaptive function.

MALE PREFERENCES

Low et al. also assume that men have always felt attracted toward the same female physical attributes that interest North American men now. It seems perfectly reasonable to make the general assumption that men are adapted to be able to discriminate and respond to various aspects of female appearance. However, the specific physical attributes they find attractive appear to be learned as part of growing up in a particular culture, not hard-wired as a fixed neurological pattern. Consider some of the anatomical variations that men have found attractive: the Victorian well-turned ankle, the Chinese woman's bound foot, the flat-chested, straight-hipped flapper, the extensive tattoos, scarring, or elongated necks of various tribal groups. In particular, the assumption that men have always found breasts to be primarily attractive is almost certainly an artifact of our culture's peculiar suppression of breastfeeding. Even in North America, male preferences have changed over the last 20 years. Garner et al. (1980) found that

Playboy centrefolds of 1980 had significantly smaller busts and hips, and significantly larger waists than they did in the early 1960s

FURTHER QUESTIONABLE ASSUMPTIONS OF LOW ET AL.

Correlation of Nonpregnant Breast Size with Lactation Success

Low et al (1987) assume that nonpregnant breast size must have some functional significance. However, there is no correlation between the size of the nonpregnant breast and subsequent success at or duration of lactation (Minchin 1985). The size of the nonpregnant breast is almost entirely determined by the amount of fat present, while lactogenic glandular tissue develops only in response to pregnancy or to the stimulus of suckling (Neifert et al 1985). This results in an increase in breast size during pregnancy and early lactation. Once lactation is well established, breast size often diminishes markedly, with no effect on milk production (Minchin 1985). Therefore the most visible correlate of lactation failure caused by underdevelopment of lactogenic glandular tissue is the failure of the breasts to enlarge *during pregnancy*, rather than small prepregnant breast size.

Neifert et al (1985) note also that women with insufficient glandular development tend to have asymmetric breasts. Another visible indicator of lactation difficulty is inverted nipples (although they are often difficult to detect by visual examination alone). If men are looking for signs of successful lactation, then they should be attracted to symmetrical breasts of any size with clearly protruding nipples, and to increase in breast size during pregnancy. Low et al (1987) mention nothing about these cues in their description of the evolutionarily "attractive" breast.

Low et al also speculate that breast size may advertise the storage capacity of the breast. This is unlikely, because milk production and storage are antagonistic functions in humans. Storage of milk for more than a few hours leads to a prompt reduction in milk production irrespective of breast size (Minchin 1985). In fact, widely spaced feedings are probably the most common reason for lactation failure (Minchin 1985). In addition the human infant's small stomach (Minchin 1985) and the low caloric and protein content of human milk are clearly adapted for frequent, small feedings and continuous maternal-infant contact (Neville and Neifert 1983).

Low et al (1987) also suggest that breast shape may signal ovulation probability. In this case, men should prefer small breasts since breast enlargement is an early and universal characteristic of pregnancy and lactation, when ovulation is unlikely.

The Obstetrical Significance of Visible Hip Width

Midwives and obstetricians use the word *pelvis* to refer to the opening in the pelvic girdle through which the fetus must pass in order to be born. This

usage can lead to confusion among those who think of the *pelvis* as the total pelvic girdle. The iliac crests, which determine visible pelvic width, have little obstetrical significance (Llewellyn-Jones 1982) and in fact are known to birth attendants as the *false pelvis*. While the biiliac diameter and the internal pelvic measurements are not totally unrelated, the external measurements are useless for predicting cephalopelvic disproportion (CPD) (Stewart 1984b), especially in adolescents (Moerman 1982).

Even for trained midwives and obstetricians using the best technology for making internal pelvic measurements, it is difficult to predict when CPD will occur for two reasons:

1. The ligaments of the pubic symphysis are softened by relaxin, a hormone of pregnancy, allowing the pubic bones to separate during birth (Stewart 1984a).
2. Traditional upright birthing positions (such as squatting) can increase internal pelvic diameters significantly (Atwood 1976, Russell 1969). Thus, much of the CPD diagnosed in modern industrial societies is attributable to the unfavorable birth postures required in our hospitals.

WOULD DECEPTION INCREASE FEMALE FITNESS?

Even if external hip measurements did give a reliable indication of the probability of CPD, it would not increase a woman's fitness to make men believe her internal pelvic dimensions were large by increasing her hip width with fat. A woman whose internal pelvis was truly small would, under ancestral conditions, probably die if she tried to give birth to a large baby. Her best strategies, then, would be 1) not to reproduce, but to invest in her relatives' offspring instead, or 2) to attract the smallest mate she could find and to take in minimal nourishment in order to produce the smallest possible living baby. Attempts to attract a large, dominant, high SES male would be counteradaptive for such a woman.

In addition, because too large an internal pelvic diameter can lead to precipitate birth and unfavorable presentations (Davis and Rubin 1966), men should not be attracted to very wide hips anyway, if hip width were an indicator of internal pelvic measurements.

ALTERNATIVE ADAPTIVE FUNCTIONS FOR FEMALE FAT

Low et al. (1987) present a logical framework in which it appears that there are only two alternative hypotheses to explain the existence of fat in breasts, hips, and buttocks. Both their hypotheses assume that sexual selection was the primary force in its evolution. With only two alternatives, evidence

against one hypothesis appears to imply support for the other. However, any consideration of the adaptive function of breast, buttock, and hip fat must include all possible alternatives if it is to provide a logical basis for critical hypothesis testing.

Experience with babies suggests a number of alternative adaptive functions for the fat, none of which involve sexual selection and most of which are easily falsifiable. The remainder of this commentary discusses these functions.

Baby-carrying

Human females, unlike other primates, have no body hair and give birth to relatively helpless babies. Therefore, human evolution involved a radical change in the relationship between mother and baby. The baby must be actively carried by the mother, in her arms or a carrying device and in either situation tends to ride on its mother's hips or buttocks. Fat hips and buttocks, then, may simply serve the purpose of increasing the mother's efficiency while carrying her child.

The need for baby-carrying devices may exert selection pressure on breast size and shape. Unlike the ape infant, which can cling to its mother's chest fur from birth, the human baby needs a breast that will hang conveniently for it as it rides on its mother's hips. Breast fat may be an adaptation for making the breast large and soft enough so as to be convenient for an infant to reach.

Insulation

Low et al. mention the role of fat as insulation, but do not consider specific alternative hypotheses involving insulation as an adaptive function. In cultures without furniture, people must either squat or sit on the ground. A woman nursing or holding a baby would find it difficult to squat, and thus might need the added insulation of fat on hips, thighs, and buttocks while sitting on the ground.

Furless mammary glands that protrude from the body (perhaps for the reasons discussed above) may need insulation in the form of fat, too. Milk production is inhibited by cold (ice packs are commonly used for this purpose when new mothers do not plan to breastfeed). In addition, infants undoubtedly benefit from milk at body temperature; they do not have to waste calories warming it themselves.

Physiological Functions

Breast and abdominal fat are involved in the conversion of androgens to estrogens (Frisch 1980). If this extra-gonadal estrogen is physiologically important, then interindividual variation in amount of fat in breasts may well

reflect differences in women's gonadal hormone production. The fact that breasts begin to enlarge well before the onset of ovulation in adolescents supports the idea that breast fat may have a homeostatic endocrine function and may in fact be crucial for the onset and maintenance of ovulation. Breast fat may also contribute to the hormonal environment that results in concealed ovulation and continuous sexual receptivity.

REFERENCES

- Atwood R J. Parturitional posture and related birth behavior. *Acta Obstetrica Gynecologica Scandinavica Supplement* 57: 1-25, 1976.
- Davis M E, Rubin R. *DeLee's Obstetrics for Nurses*. Philadelphia: Saunders, 1966.
- Frisch R E. Fatness, puberty, and fertility. *Natural History* 89(10): 16-27, 1980.
- Garner D M, Garfinkel P E, Schwarz D, and Thompson M. Cultural expectation of thinness in women. *Psychiatric Research Reports* 47: 483-491, 1980.
- Gee E M T. Marriage in nineteenth-century Canada. *Canadian Review of Sociology and Anthropology* 19: 311-325, 1982.
- Llewellyn-Jones D. *Fundamentals of Obstetrics and Gynecology*. London: Faber and Faber, 1982.
- Low B S, Alexander R D, and Noonan K M. Human hips, breasts, and buttocks: Is fat deceptive? *Ethology and Sociobiology* 8: 249-257, 1987.
- Minchin M. *Breastfeeding Matters*. Sydney: Alma Publications, 1985.
- Moerman M L. Growth of the birth canal in adolescent girls. *American Journal of Obstetrics and Gynecology* 143: 528-532, 1982.
- Neifert M R, Seacat J M, and Jobe W E. Lactation failure due to insufficient glandular development of the breast. *Pediatrics* 76: 823-828, 1985.
- Neville M C, Neifert M R. *Lactation: Physiology, Nutrition, and Breastfeeding*. New York: Plenum, 1983.
- Russell J G B. Moulding of the pelvic outlet. *Journal of Obstetrics and Gynaecology of the British Commonwealth* 76: 817-820, 1969.
- Stewart D B. The pelvis as a passageway. I. Evolution and adaptations. *British Journal of Obstetrics and Gynecology* 91: 611-617, 1984a.
- The pelvis as a passageway. II. The modern human pelvis. *British Journal of Obstetrics and Gynecology* 91: 618-623, 1984b.