

Book Review

Dual Sexual Strategy in Females – Is the Mysterious Nature of Women Explained?

A review of Randy Thornhill and Steven W. Gangestad, *The Evolutionary Biology of Human Female Sexuality*. Oxford University Press, New York, 2008, 411 pp., US\$49.95 ISBN 978-0-19-534099 (softcover).

Boguslaw Pawlowski, Dept. of Anthropology, University of Wroclaw (PL) and Institute of Anthropology, Polish Academy of Sciences (PL), Email: bogus@antropo.uni.wroc.pl.

Human female sexuality has been quite a hot topic during the last 50 years and in their “*Abridged history of the study of woman’s sexuality*” at the start of *The Evolutionary Biology of Human Female Sexuality*, the authors distinguish three waves of research on this topic. Although some of the ideas presented in this book are already known, it seems to me that this work is complete; it synthesizes many different strands of research and places human sexuality in a broad context of reproductive biology. Thornhill and Gangestad’s book could be the manifesto of a new forth wave.

There has been continuous and growing scientific interest in female sexuality and our knowledge has continued to expand since theoretical works on human and non-human primate female sexuality started to appear (e.g., Alexander and Noonan, 1979; Dixson, 1998; Pawlowski, 1999; Symons, 1979), I therefore have no doubt that the present book will be welcomed by those many researchers who are interested in the topic.

Was estrus lost in human evolution? Is ovulation concealed and, if so, was this caused by sexual selection? Were subtle changes in voice, morphology or scent (all due to steroid hormone level changes) within the human female menstrual cycle selected by evolution as signals of fertility? Do females use different strategies in fertile and non-fertile phases of their cycle, and if so, why do they have this dual strategy? These are questions, among many others, that this book answers. Even readers already knowing the answers to these questions may well be surprised by Thornhill and Gangestad’s viewpoints.

I am afraid that the longstanding presumption that in human evolution estrus was lost under some specific sexual selection is still prevalent in the literature. This is probably mainly due to the difference between visual signs of estrus in the form of anogenital swelling in chimps and the lack of it in humans (but it is often forgotten that other *Hominoids* also show no visual signals). Even in the late 1990s, loss of estrus and concealed ovulation in the evolution of the human female was more than a presumption; it was taken for granted. A decade ago I suggested

that estrus in the human female has not been lost and that ovulation has not been concealed (Pawłowski, 1999). I also postulated that diminished signs of estrus in the human female does not have to be the result of sexual selection acting in our evolutionary past. I hope that this book may reach a wide audience and thereby inform scientific opinion that has not yet been acquainted with the evidence presented in journal articles over the last 10-15 years.

For the majority of men, women have a complicated, mysterious nature. This seems, however, to be a problem not only for the average man. Despite all present psychological and biological knowledge, scientists remain perplexed by women's sexual nature in particular. Presenting evidence from studies not only on humans but also from non-human primates and many other vertebrates, Thornhill and Gangestad try to show that women have a "dual sexual strategy," which means that they adopt different mate choice criteria and different sexual strategies in fertile and non-fertile phases of the menstrual cycle. When fertile, they try to choose a mate with "good genes", and when non-fertile, they adopt strategies to retain a male partner from whom they may obtain some material benefits. Furthermore, Thornhill and Gangestad claim that to be selective in the fertile phase of the menstrual cycle (i.e. preferring males with cues indicating high genetic quality), females should not "openly" advertise ovulation. However, due to conflict in the co-evolution of the sexes and necessary physiological (hormonal) changes in the menstrual cycle, even human females are unable to conceal their fertile phase completely.

Some of the authors' ideas are uncontroversial but others are debatable. Their claim that estrus has not been lost in human evolution and that human female sexuality is still under the influence of steroid hormones should be easily accepted (see Pawłowski, 1999). However, three mantras that are repeated throughout this book cannot be accepted so readily: 1) Sexuality at peak fertility serves to acquire a male with "good genes" (so as to sire offspring with "good genes"); 2) All morphological, vocal or other female traits that become more attractive to males in the fertile phase of the menstrual cycle are incidental by-products of changes in the female's physiology (and therefore are not signals selected by evolution); 3) Extended sexuality (called constant or continual receptivity in the literature) is present in order to obtain material benefits from males.

The authors' theses are clear, and the immense supporting evidence reported from both non-human animals and humans is breathtaking. My quibbles are rather minor: In my opinion, the authors repeat their theses too often; by avoiding such redundancy, their book would have been shorter (readers interested in a convenient summary of their arguments might want to consult Gangestad and Thornhill, 2008). More figures and illustrations would also have made the book friendlier to the lay reader in particular.

I would have preferred more detail when analyzing the evolutionary conditions in which a dual strategy could have been selected for. The authors concentrate too much on the different phases of the menstrual cycle, neglecting the fact that such cycles (and therefore regularly menstruating females) are a somewhat new phenomenon. When considering evolved sexuality, one should remember that in our evolutionary past (and that of mammals generally), females had far fewer fertile cycles than they experience today. They were more regularly pregnant or lactating (with suppressed ovulation). This might mean that if females have a different sexual strategy in the non-fertile (i.e. luteal) phase of their menstrual cycle, it may be a side effect of the strategy that was used in the evolutionary past by females during pregnancy and lactation, in this case perhaps related to high levels of progesterone. Although the authors mention that by being sexually active during pregnancy, females are more able to obtain material benefits from males, their main arguments and evidence in support of such a dual human female strategy comes from

comparing fertile and non-fertile phases of the menstrual cycle (one problem here might be that there are few data on human female sexuality during pregnancy and lactation). However, Thornhill and Gangestad also indicate that this dual strategy is an evolutionarily old phenomenon (a plesiomorphic trait), and I agree.

Another controversial issue is the authors' hypothesis that estrus in vertebrates does not function to ensure insemination and conception but functions rather to motivate a "hunt for good genes". They claim that cues to estrus are just by-products of the physiological changes associated with fertility (e.g., in estrogen levels), and that these cues are not signals. The issue is complicated and consideration needs to be given not only to social and reproductive systems, but also to frequent restrictions, conditionality and limited female choices due to sex ratio or male intrasexual competition. Thornhill and Gangestad also recount some novel, ultra-adaptationist ideas: e.g., periovulatory nadir in food or water consumption might be a way not to be tempted by "males who offer food but are of inferior genetic quality" (p. 255).

This book is dedicated not only to the biological anthropologists, evolutionary psychologists and behavioral ecologists who are probably well acquainted with the subject, but also to a broader range of readers. The authors discuss in great detail the methodology of studying female sexuality, evolutionary theories related to reproductive biology and hypotheses that lie behind contemporary biological approaches to studies of sexual behavior. Thornhill and Gangestad also extensively discuss male sexual adaptations and preferences, sperm competition, signaling theory, and mechanisms of sexual selection including sexually antagonistic co-evolution. Furthermore, they critically discuss different hypotheses on estrus function and the meaning of different ovulatory cues. They clearly explain concepts like coefficients of variation, fitness variation, antagonistic evolution, host-pathogen evolution and other fundamental evolutionary mechanisms related to genetic variation.

The Evolutionary Biology of Human Female Sexuality is not only about human female sexuality; at least a third is dedicated to vertebrate reproductive biology and to male sexuality, including many examples of sexual strategies in non-human primates, other mammals, and birds. (The latter are an especially good group for analyzing the sexual strategies involved in pair-bonding.) This book also functions as a bibliographic record of papers on the evolution of sexuality and reproduction, with over 60 pages of references; I calculate approximately 1200 references, an impressive display of scholarship. It will be a very instructive resource for students.

When it comes to the general topic of the evolution of human female sexuality and reproductive biology, I believe this book will be as important as was Symons' (1979) or the chapter by Alexander and Noonan (1979). This does not mean that the ideas presented by the authors are the last words on the subject. In the final chapter, entitled "Reflections," Thornhill and Gangestad clearly state that their concepts and answers are "provisional" and that instead of declaring firm truths they rather "offer frameworks that can generate fruitful future research" (p. 321). I encourage readers to treat it both as a comprehensive review of present knowledge on the evolution of female sexuality and as a source of interesting new ideas that should encourage further research. My own reading of this book inspired a few new hypotheses, good evidence that in addition to being a valuable repository of current knowledge, it is also thought provoking and potentially inseminating.

A final reflection: Is the mysterious nature of women explained? Despite fascinating hypotheses and much evidence supporting them, I think that to discover all the mechanisms of

the evolution of human female sexuality and to fully understand women, we still have a lot of work to do.

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