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Book review

The psychologic gambit declined—a review of "Endocrinology of Social Relationships"

P. Ellison and P. Gray. Cambridge, MA: Harvard University Press, (512 pp. Price: $49.95)

In chess, a gambit is the sacrifice of material, usually pawns, in order to gain superior position. In evolutionary biology, the "phenotypic gambit" is the implicit assumption that genetic data can be sacrificed in testing evolutionary hypotheses because phenotypes adequately predict underlying genotypes (Grafen, 1984). Evolutionary psychologists often play a third gambit, which I will call the psychologic gambit. This is the implicit assumption that neurophysiological underpinnings can largely be ignored when testing evolutionary hypotheses about behavior and psychology. After all, if one is interested in the evolutionary functions of behavioral and psychological patterns, does it matter whether these patterns depend upon the nucleus accumbens or the basolateral amygdala, for example, or upon vasopressin or oxytocin, when selection really only "sees" the behavior? Thus, although Tooby and Cosmides (2005, p. 6) note that evolutionary psychological models should eventually "include the neural, developmental and genetic bases" of psychological mechanisms, evolutionary psychologists in general do not appear to view this need as pressing.

On the one hand, the psychologic gambit has profitably directed research in evolution and behavior. We have made considerable progress in understanding the evolutionary functions of mate preferences, for example, without knowing the neurophysiological bases of these preferences. On the other hand, more detailed proximate knowledge better characterizes the phenotype to be explained and can thus clarify ultimate causes. For example, the functional reasons for menstrual cycle variation in women's mate preferences (Gangestad & Thornhill, 2008) will likely be elucidated by knowledge of its hormonal basis. Hormonal data have been used to test whether cyclic preference shifts function in recruiting high-quality genes near ovulation or are byproducts of a pregnancy-related adaptation or an adaptation for changing preferences between cycles (Jones et al., 2005; Puts, 2006; Roney & Simmons, 2008).

Of course, ultimate understanding can also clarify proximate mechanisms such as hormone-behavior relationships. Consider the debate about whether androgens have "activational" effects (disappearing after the hormones leave the blood) or only "organizational" (relatively permanent) effects on human spatial cognition (Puts, Gaulin, & Breedlove, 2007). This debate may be informed by the hypothesis that male ranging behavior and spatial ability function in mate location (Gaulin & FitzGerald, 1986). In seasonally breeding rodents, male testosterone levels, range size and navigational ability increase during the breeding season (Galea, Kavaliers, & Ossenkopp, 1996; Gaulin & FitzGerald, 1989), whereas androgens have only organizational effects on spatial navigation in non-seasonal breeders (Commins, 1932). Seemingly, selection tends to favor continued androgen responsiveness of costly ranging behaviors and their neurophysiological substrates in seasonally breeding species. This functional insight suggests that androgens might not have activational effects on spatial ability in a largely non-seasonally breeding species such as humans.

In their edited volume *Endocrinology of Social Relationships* (*ESR*), Peter Ellison and Peter Gray recognize that ultimate and proximate (perhaps especially neuroendocrine) explanations make reciprocal contributions, and emphasize the importance of approaching behavioral questions from all levels of Tinbergen's (1958) fourfold explanatory framework. *ESR* is a collection of 16 well-written reviews, by authorities in their respective areas, of the roles played by hormones in mediating social relationships, including parental care, mating behavior, and dominance. Ellison and Gray are themselves "heavy hitters" in behavioral endocrinology, and so it is unsurprising that they were able to recruit many of the stars of the field to author chapters. Part 1 of the book's three sections provides theoretical and empirical background in evolution and behavioral endocrinology. Although *ESR* highlights human research, Part 2 focuses on social relationships among nonhuman mammals, and Part 3 focuses on the endocrinology of human social relationships.

The chapters of *ESR* generally do an excellent job of illustrating the interrelatedness between explanations at multiple levels. For example, in chapter 3, Peter Ellison discusses how hormones carry information about the state of the organism, facilitating adaptive allocation of reproductive effort in response to this information, and Emery Thompson's chapter on the endocrinology of social relationships in nonhuman apes is pleasantly infused with much ultimate-level explanation. Pablo Nepomnaschy and Mark Flinn review how children's stress responses are influenced by early life events, adeptly integrating proximate and ultimate levels of analysis in suggesting that responses to stress (e.g., depression) may be adaptations and

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that apparent negative outcomes may have unknown benefits to survival and reproduction.

More integration of proximate and ultimate reasoning is nevertheless occasionally desirable throughout the volume. For example, in chapter 10, Matthew McIntyre and Carole Hooven expertly review organizational and activational effects of androgens in mediating sex differences in human social relationships. The authors contend that androgens affect childhood emotional states and activity levels, which lead to play patterns and social relationships that culminate in adult sex differences in personality. This scenario is plausible, but more ultimate-level reasoning would be welcome. One wonders, for instance, why selection would favor a developmental pathway with so many possibilities for environmental perturbation. Does selection favor such tortuous ontogeny when substantial physical or social practice is required to produce successful adult phenotypes?

One measure of a book's value is the degree to which it suggests new research ideas or fuels thought-provoking controversy, and *ESR* is ample in this regard. Reviews of nonhuman research in *ESR* are particularly likely to suggest new studies to researchers of human behavior. For example, Toni Ziegler and Charles Snowdon cover the endocrinology of social relationships in biparental monkeys, reviewing evidence that fathers and sibling helpers experience postpartum hormonal changes in callithricids. These interesting data prompt the question of whether human males' testosterone levels respond to newborn siblings, given parallel hormonal changes in new fathers (Storey, Walsh, Quinton, & Wynne-Edwards, 2000) and high investment by older human siblings.

A potentially controversial area touched upon in *ESR* concerns the evolutionary causes of menstrual cycle variation in women's preferences. In discussing the role of sex hormones in the initiation of human mating relationships, James Roney presents his hypothesis that shifts in women's mate preferences over the menstrual cycle are byproducts of an adaptation for tracking between-cycle changes in fertility (e.g., due to pregnancy or nutritional status) and that estradiol is the signal that modulates these shifts. This hypothesis contrasts with the prevailing view that cyclic shifts function to increase women's attraction to good-genes males near ovulation. However, it is an interesting hypothesis that bears testing. It may well be the case that selection shaped women's preferences to track both between- and within-cycle changes in fertility.

Jane Lancaster and Hillard Kaplan discuss relationships between hormones and the "human adaptive complex," a coadapted complex of traits including life history, diet, reproductive energetics, social relationships, intergenerational resource transfers and cooperation. This is an insightful and authoritative chapter, potentially contentious for its de-emphasis of between- and within-sex conflict, including sexual selection. For example, Lancaster and Kaplan attribute human sexual dimorphisms, such as increased size and strength in men, primarily to sexual division of labor rather than to sexual selection. This scenario may not appear parsimonious to some readers, given that, across species, large, strong, aggressive males are generally a sign of male competition for mates. This scenario also seems incapable of explaining large sexual dimorphisms in voice, facial hair, male–male aggression and female body fat distribution, which are probably better explained by sexual selection (Puts, 2010).

The cohesiveness and organization of *ESR* are excellent for an edited volume, but like most edited volumes, *ESR* lacks the flow of a monograph. The writing is unavoidably dry and technical at times, but is for the most part cogent and focused. In covering the neurophysiological mechanisms by which hormones affect, and are affected by, social relationships, Kim Wallen's and Janice Hassett's writing is especially clear, at times bordering on poetic: "Were one able to image all of the steroids and steroid metabolites as light, our bodies would likely appear to glow in the dark" (p. 37).

Overall, *EST* is a superb book and is highly recommended. Those interested in the evolution of human behavior stand to benefit from exploring neurophysiological mechanisms and their developmental basis. Molecular genetics and neuroscience are logical areas of focus, but behavioral endocrinology is arguably the most practical. *ESR* demonstrates the reciprocal utility of evolutionary and endocrinological approaches and will be valuable to both experts and those seeking an introduction to human behavioral endocrinology. Chess gambits often fade from tournaments as players learn to refute them. If not a refutation of the psychologic gambit, *ESR* illustrates that evolutionary psychologists have much to lose by ignoring the neuroendocrine underpinnings of psychology and behavior.

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