

population-level indicators. Schmitt finds that eight of the nine relationships are in the direction predicted by strategic pluralism theory, resulting in what looks like strong support for that theory and little support for developmental/ attachment theory. Tables 8–10 appear to provide further support for strategic pluralism theory. In fact, however, what appear to be multiple tests of these theories can be reduced to just two, because all of the population-level measures can be reduced to two principal components. In a principal components analysis of the correlation matrix in Table 4, we found that economically prosperous societies also have higher human development indexes, greater life expectancies, lower birth rates, lower teen pregnancy rates, lower infant mortality rates, lower fertility rates, higher average birth weights, and so on. (Not all variables could be included in our analysis because the matrix is not positive definite, but if we had been able to use the raw data, the other variables would most likely have loaded on the primary factor, too.) Only one principal component had an eigenvalue greater than 1.0; it accounted for 79% of the variance. All seven of the variables in the positive definite matrix loaded above .70 on this factor, with most loading above .90. Thus, all of the findings related to the correlation matrix reduce to one: College students in economically better off societies report more liberal sexual attitudes and behavior than students from poorer, less developed societies.

Similarly, the measures of gender equality in Table 8 form a single factor (accounting for 68% of the variance) that correlates with both our poverty/wealth factor and liberal sociosexuality. Hence, what looks like 13 associations between gender equality and sociosexuality can be reduced to one: College students, especially women, in countries with greater gender equality report more liberal sexual attitudes and behavior. As before, there is no way to draw conclusions about evolutionary psychology from this finding. In other words, Schmitt inadvertently created a situation in which evolutionary theories predict nothing more than one would expect without reliance on neo-Darwinian theory.

## Fitting data to theory: The contribution of a comparative perspective

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**Abstract:** In this commentary, I consider Schmitt's cross-cultural investigation of sociosexuality from a comparative perspective. I argue that such a perspective lends support to an evolutionary explanation of a number of Schmitt's findings, including universal sex differences in sociosexuality and the sensitivity of mating behavior to contextual variables such as sex ratio.

Schmitt's cross-cultural survey of sociosexuality is a genuinely outstanding achievement. The data he presents are powerful and convincingly demonstrate sex differences and national differences in the extent to which people engage in monogamous versus promiscuous mating. However, the pattern of results and the explanation of those results are two separate issues. In this commentary, I address the latter issue. The question I explore is this: How confident should we be in attributing Schmitt's findings to evolutionary selection? To answer this question, I place these findings within the framework of a comparative perspective. My conclusion is that, in many cases, adopting this perspective does indeed support an evolutionary interpretation of Schmitt's findings.

The clearest example relates to what is probably Schmitt's least controversial finding: that in every nation surveyed in the International Sexuality Description Project (ISDP), men are more oriented toward promiscuous mating than women. How does a comparative perspective inform the interpretation of this result? The most striking thing about Schmitt's finding from a comparative perspective is its consistency with a major trend found in the ani-

mal kingdom, namely, that the sex that invests less in offspring tends to exhibit more interest in indiscriminate mating with multiple partners than does the higher investing sex (Trivers 1972). When speaking of nonhuman species, theorists inevitably explain this sex difference in evolutionary terms. For example, no one would wish to explain the greater pursuit of sexual partners by male than female turkeys or frogs as a product of arbitrary cultural whims or patriarchal norms. Given that we accept an evolutionary explanation for this sex difference in other species, it would seem tenuous to argue that the same phenomenon in humans is wholly a product of a completely different cause: learning or culture. Certainly, it is possible. However, we should have a strong reason to make this exception. Without such a reason, the default interpretation of the data should be that we are continuous with the rest of nature and thus that the sex difference in sociosexuality has an evolutionary origin.<sup>1</sup> Conversely, a higher standard of evidence should be demanded of theories that claim that this difference is explicable entirely in sociocultural terms. The general point here is that, to the extent that an aspect of human behavior is consistent with patterns found in the rest of the natural world, the onus of proof should fall more to advocates of nonevolutionary explanations of that behavior than to advocates of evolutionary explanations.

Next consider the finding that differences in national levels of sociosexuality are related to differences in variables such as sex ratio and environmental demand. Schmitt interprets this result in terms of the operation of a flexible evolved mating psychology, sensitive to evolutionarily significant ecological conditions. At first glance, the type of argument used above might not seem to support this position. It might be argued, for example, that most species have relatively inflexible mating systems: Chimpanzees are polygynandrous, gorillas polygynous, and gibbons monogamous (socially if not always sexually; Reichard 1995). However, the type of flexibility posited by Schmitt and other evolutionary psychologists is not without precedent among nonhuman animals. Variable mating systems are particularly common among birds (Castro et al. 1996; Dobson et al. 2000; Sorenson 1992). Furthermore, in many cases, they are responsive to variables such as those investigated in the target article.<sup>2</sup> One of the best examples of a species with a variable mating system is the dunnoek, a small brown bird whose repertoire includes monogamy, polygyny, polyandry, and polygynandry (Davies 1985; 1989; Hatchwell & Davies 1990). The mating system found in a given dunnoek population is determined by various factors, including sex ratio and resource availability. The existence of variable mating systems in dunnoeks and other birds increases the plausibility of the claim that variability in human sociosexuality across different environments can be attributed, at least in part, to evolutionary selection.

Admittedly, this argument is weaker than that for evolved sex differences in sociosexuality. After all, variable mating strategies are less common in the animal kingdom, and the best examples are found in birds rather than more closely related species. Furthermore, there may be important differences in the mechanisms underlying variable mating in birds versus humans. As Schmitt's data show, in the human case, shifts in the prevailing mating system appear to involve changes in individual mating psychology, including attitudes and fantasies. In contrast, Davies (1985, 1989) has argued that, although dunnoek mating systems change, individual mating preferences do not. Instead, the mating strategy pursued by males differs from that pursued by females, and any shifts in mating system represent different outcomes of male-female conflict in different contexts. For example, when the sex ratio is female-biased, males are better placed to enact their optimal mating strategy (polygyny); whereas when the sex ratio is male-biased, females are better placed to enact theirs (polyandry).<sup>3</sup> Considerations such as these weaken the argument presented in the preceding paragraph. Nonetheless, at the very least, the comparative evidence suggests that functional explanations of cross-cultural differences in sociosexuality cannot simply be dismissed as the overenthusiastic application of adaptationist reasoning. They

are consistent with trends observed in other animals, and therefore an evolutionary interpretation of the data deserves our most serious attention.

My final comment relates to the value of a comparative perspective in generating hypotheses about human psychology (see, e.g., Shackelford & LeBlank 2001). Although variable mating systems are not unknown among nonhumans, many species possess relatively inflexible mating systems. The particular system adopted by a species is predictable from variables related to that species' ecology. For example, monogamy and biparental care are more common in species for which reproduction is more demanding. In light of this trend, consider Schmitt's finding that, among humans, reproductively demanding environments are related to higher levels of monogamy and biparental care. This result raises the possibility that humans have evolved several behavioral strategies in this domain, each of which would normally typify a single species. If this is a general trend in human evolution, comparative research may help us generate hypotheses about facultative psychological adaptations in humans. Put simply, the environmental variables that predict between-species differences in behavior in nonhumans may be used to predict within-species differences in human behavior.

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#### NOTES

1. As Schmitt demonstrates, however, sociocultural variables also influence the size of the difference.
2. Of course, this does not apply to variables such as the proportion of women in parliament.
3. See Alexander (1979) for discussion of the possibility that invariant mating preferences in humans could give rise to either monogamy or polygyny depending on the distribution of resources in a society.

## Sex, sex differences, and the new polygyny

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**Abstract:** The Sociosexual Orientation Inventory (SOI) was not designed to illuminate the sexually dimorphic mental mechanisms posited by evolutionary theories. Its results are therefore open to competing interpretations. Measures designed to tap the thought processes surrounding sexual experience generate findings that are more compatible with evolutionary than with social structural theory.

Schmitt's research makes an important contribution. My remarks are therefore intended to be heuristic rather than critical. In the target article, Schmitt states that both strategic pluralism theory and social structural theory (SST) are needed to explain the full spectrum of sex differences (sect. 6.7.2). A longitudinal, cross-cultural study of changes in social roles and sociosexuality could help to determine which theory is more compelling. Clearly, such a study would be worthwhile, but Schmitt's findings are consistent with both theories not because the theories are equally compelling but because the Sociosexual Orientation Inventory (SOI) does not effectively tap pivotal sex differences in sexual psychology (Townsend 1995; Townsend & Wasserman 1998).

Most of the mental mechanisms that moderate sexual behavior are monomorphic; one strategy to illuminate dimorphism in mental mechanisms is to design measures that maximize sex differences in traits that are theoretically postulated as dimorphic (Symons & Ellis 1989). The following are some of the sex differences predicted by evolutionary theories: Men place more emphasis than women on physical attractiveness in choosing partners for sex or marriage and are more readily aroused by visual stimuli, that is, the sight of a potential sex partner; consequently, evalua-

tion of acceptability for coitus can be virtually instantaneous for males but tends to take longer for females. Women place more emphasis than men do on partners' ability to invest (prowess, dominance, resources) and on signs of partners' willingness to invest (affection, commitment, and emotional involvement; Buss & Schmitt 1993; Townsend 1998).

Social structural theory posits that bifurcated sex roles and manifest patriarchy produce, through socialization, sex differences in sociosexuality; as patriarchy declines and women become more empowered, sex differences in sexuality also decline (sect. 6.7.1). Logically, as women become more empowered and unrestricted sexually, sex differences in partner-selection criteria should also decline. This does not happen. Upwardly mobile women raise their socioeconomic standards for partners rather than lower them (see Townsend 1998, for a review). Furthermore, survey and ethnographic data and experimental manipulations indicate that even when women voluntarily engage in short-term, low-investment sexual relationships, women's interest in partners' ability and willingness to invest remains unabated, or in some cases, actually increases with increasing sexual permissiveness. Men's interest in these traits, however, declines with increasing numbers of partners; for short-term partners, a visual scan of physical attributes suffices (Townsend 1998; Townsend & Wasserman 1998). Thus, women's criteria for short- and long-term partners are similar, whereas men's criteria show greater differences (Buss & Schmitt 1992). Apparently, although the sexes' overt behavior may appear to be identical, dimorphic mental mechanisms cause the motives, assessment of partners, and evaluations of sexual experience to differ.

Social structural theory suggests that sex differences in sexuality should covary with gender-role ideology. Actually, factors such as gender-role attitudes and parental and peer socialization have not proven to be reliable predictors of sexual behavior (Townsend 1998, p. 241). In Townsend (1993), neither women's SOI scores nor their insistence that future husbands' socioeconomic status be equal or superior to their own covaried with scores on the Attitudes Toward Women Scale (AWS). In contrast, men with high SOI scores had lower AWS scores and greater economic resources. Men with higher AWS scores reported less emphasis on future wives' physical attractiveness and less willingness to support wives financially, but high scorers were just as eager as low scorers to copulate with physically attractive target persons, so their lower number of sex partners and marital preferences arguably reflect market realities: having fewer economic resources, they are less able to attract and marry highly physically attractive women and financially more likely to need their wives to work (Townsend 1998). This conclusion is consistent with Schmitt (sect. 4.1): Higher-status men are more attractive to women and therefore more able to indulge their desire for low-investment copulation with multiple, physically attractive partners; more "robust" men can, and so they do (Gangestad & Simpson 2000).

Contrary to SST, increasing women's financial independence and sexual freedom does not cause the sexual behavior of men and women to converge. In fact, it produces higher rates of functional polygyny. As women become financially independent and more sexually permissive, their attraction to dominant men and men's taste for partner variety allow high-status men to have sex with unprecedented numbers of partners (Townsend 1998). To test this proposition empirically, researchers need only compare total numbers of partners for the men in current studies to figures from previous decades. If the variation in numbers of partners for contemporary men exceeds variation in previous periods and exceeds the variation in women's number of partners (which it always does), then the rate of functional polygyny has increased (van den Bergh 1979). The enormous numbers of sex partners attributed to male celebrities are neither apocryphal nor a fluke; they reflect the interaction of women's increasing economic independence and consequent sexual freedom, their attraction to dominant men, and men's desire for partner variety. Innate sex differences in sexual psychology offer a better explanation of this development than