

nances of a prospective mate. Other differences presented by Buss could also be explained by the subordination of women in patriarchal culture, rather than as a result of differences in evolutionary adaptation.

Although Buss rejects dualistic thinking, I would argue that his use of the paternity hypothesis as an explanatory framework encourages dualistic thinking. It focuses on differences in reproductive strategies and uses a single biological variable, paternity certainty. In contrast to this focus on *sex differences*, recent feminist scholarship in primate research has documented the behavioral *overlap* in male and female potential for sex, aggression, and parental involvement. Rather than a narrow focus on a single variable, more recent theories emphasize the interaction of biological, ecological, and sociological variables.

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- Sexual Selection" (Buss, 1995, March) raise some important issues and show overlap with the conclusions I drew. We seem to agree that (a) women's skills have contributed importantly to the survival of children and family; (b) humans are similar to, and different from, other species; (c) casual sex can sometimes provide adaptive benefits to women as well as to men; (d) there is great overlap between the sexes in many psychological domains; and (e) psychological sex differences are deeply illuminated when placed within the context of evolutionary theory.
- Nonetheless, the two commentaries show a lack of attention to the available scientific evidence about sex differences on the one hand, and some problematic conceptualizing on the other.

## Clues to an Ancestral Past

Both commentators question the evolutionary importance of paternity uncertainty. Silverstein (1996, this issue) draws attention to other primate species (and by implication, humans), in which both sexes seem to be highly promiscuous, whereas Derry (1996, this issue) suggests that ancestral humans were probably highly monogamous. The problem with these positions is that they are incompatible with an avalanche of empirical data on humans.

Behavioral, physiological, and psychological clues point powerfully to a human evolutionary history in which paternity uncertainty was an adaptive problem for men. *Behavioral clues* include the widespread occurrence across all known cultures of extramarital affairs, including the Ache of Paraguay (Hill & Hurtado, 1995), the Yanomamo (Chagnon, 1983), the !Kung San (Shostak, 1981), Brazilian Amazonians (Gregor, 1985), and the Australian aboriginal Tiwi (Hart & Pilling, 1960). Furthermore, a woman's sexual infidelity is the leading cause of divorce found in a massive study of 89 cultures (Betzig, 1989).

*Physiological clues* include human testicular volume, which is lower than the highly promiscuous chimpanzee but substantially higher than the more monogamous gorilla (Smith, 1984). The recent discovery of several distinct sperm morphs, including the "seek and destroyers," "blockers," and "egg-getters," suggests an ancestral history of sperm competition (Baker & Bellis, 1995). Furthermore, blood group studies of paternal discrepancy provide estimates that 9–30% of children have genetic fathers other than their putative fathers (Baker & Bellis, 1995).

*Psychological clues* to the importance of paternity uncertainty include the destructive emotion of male sexual jealousy, which

has been found to be the leading cause of spousal battering and homicide in all cultures for which we have good data (Daly & Wilson, 1988). The observation, discovery, or suspicion of sexual infidelities—the events that compromise paternity certainty—are the major triggers of male sexual jealousy. The well-documented sex differences in the weighting given to the cues that trigger jealousy—men more upset by sexual infidelity, women more upset by emotional or commitment infidelity—indicate psychological design features precisely as predicted by an evolutionary account of the problem of paternity uncertainty (Buss, Larsen, Westen, & Semmelroth, 1992; Buunk, Angleitner, Oubaid, & Buss, in press; Wiederman & Allgeier, 1993).

In short, the behavioral, physiological, and psychological evidence overwhelmingly points to a long evolutionary history of the problem of paternity uncertainty. This problem may be especially important among humans because, unlike most other primate species, men sometimes invest heavily in offspring, which would mean that being cuckolded would have jeopardized years or decades of "parental" effort. These are precisely the conditions under which the problem of paternity uncertainty would have been especially important.

## A Complex Repertoire of Mating Strategies

Silverstein (1996) implies that both sexes were likely to be highly promiscuous, whereas Derry (1996) suggests that humans evolved in a monogamous context. I think both are wrong, or rather each is only partially right. We now have overwhelming evidence that both men and women have a complex repertoire of sexual strategies that includes both long-term mating and short-term mating (Buss, 1994; Buss & Schmitt, 1993). Clearly, if men have faced the problem of paternity uncertainty, as outlined above, then women must have engaged in some short-term mating.

It is doubtful that women would recurrently engage in short-term mating over human evolutionary history without some adaptive benefits accruing from the strategy. Led by my colleague Heidi Greiling, we have been testing hypotheses about what these adaptive benefits might be, including possibilities such as resource benefits, genetic benefits, mate switching benefits, skill-acquisition benefits, and mate manipulation benefits (Buss & Schmitt, 1993; Greiling & Buss, under review). Clearly, women's short-term mating has been a relatively neglected phenomenon in both psychology and evolutionary accounts, and we are taking steps to correct this bias.

## Paternity Uncertainty and the Complex Repertoire of Human Mating Strategies

David M. Buss  
Department of Psychology,  
University of Michigan

The two commentaries on my article, "Psychological Sex Differences: Origins Through

Nonetheless, in our view it is simply wrong to characterize humans as promiscuous by drawing attention to other primates who are—sometimes called the “pick a primate fallacy” that has long been discarded as a means for drawing inferences about humans. And it is equally wrong to depict humans as living in monogamy, either currently or in the past. Furthermore, despite the importance of women’s short-term mating, it is equally important to bear in mind the overwhelming empirical evidence for a sex difference in the desire for sexual variety. Literally hundreds of empirical studies show that men desire a larger number of casual sex partners, have more frequent sexual fantasies, engage in partner-switching more often during those fantasies, devote more effort toward pursuing extramarital affairs, more often seek the services of prostitutes, and more often consent to short-term sexual opportunities (see Buss, 1994; Oliver & Hyde, 1993; and Symons, 1979, for extensive reviews of this evidence). The powerful desire men have for sexual variety may not be comforting news, nor should it obscure the reality and importance of women’s short-term mating strategies. But the sex difference is real and too well-documented empirically to be dismissed.

### Getting Rid of False Dichotomies

Silverstein (1996) argues that “patriarchal culture” (p. 160) provides an explanation superior to evolutionary psychology’s for known sex differences. Men’s desire to control women’s sexuality, their tendency to punish “loose women,” and women’s lower “reported” desire for sexual variety are all attributed to “patriarchal culture.” The problems with this view are outlined at length elsewhere (Buss, 1996; Buss & Malamuth, 1996). Phrases such as “the traditional sexual division of labor which relegated women to roles” (p. 160) simply obscure causality. It is not clear what causal agent is doing the “relegating” and “assigning to roles,” and the vague invocation of abstractions such as “culture” or “society” or “patriarchy,” despite their popularity among some social scientists, is worse than no explanation at all. These constructions conflate the phenomena to be explained with a proper causal explanation of those phenomena.

The components of what is called “patriarchy” can themselves be explained by models emerging from evolutionary psychology (Buss, 1996; Smuts, 1995). Men’s control over resources and concern over women’s sexuality, as well as women’s strategies to subvert that control and pursue their own strategies, are powerfully explained by coevolutionary models of women’s and

men’s sexual strategies. Women’s desire for men with resources, for example, imposes selection pressure on men to pursue competitive strategies by acquiring the resources that women desire (Buss, 1996).

Evolutionary psychology provides a powerful interactionist model. Human behavior cannot be explained without articulating evolved psychological mechanisms combined with the social and cultural input to those mechanisms. Through this interactionist framework, we can move beyond the false dichotomies of genetic versus learned, nature versus nurture, and biology versus culture. Evolutionary psychology provides the best account we have of where men and women show psychological differences, where they share the same psychology, and the social contexts in which each is expressed.

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## Chi-Square Can Engender Confusion

Robert J. Grissom  
Department of Psychology,  
San Francisco State University

Hyde and Plant (March 1995) wanted to show that “more gender differences . . . fall in the close-to-zero category than other effects in psychology” (p. 160) by presenting a contingency table (Table 1, p. 160) in which columns (dependent variable) were five ordinal categories of increasing effect sizes ranging from “0–0.10” to “over 1.0.” The two rows (independent variable) of the table were “Gender differences” and “Other effects in psychology.”

Chi-square was significant at  $p < .0001$ , leading the authors to the correct conclusion that “the difference between the distributions of gender effect sizes and other effect sizes is highly significant” (Hyde & Plant, 1995, p. 160). However, if the purpose is to determine if gender effect sizes tend to be smaller than other effect sizes—not just distributionally different in some