

committed mateships (v) men paired with physically attractive women exhibit elevated jealous mate-guarding, whereas (vi) women paired with more resource-endowed men exhibit more jealous mate-guarding [7]. (vii) Near ovulation – the critical window in which a man's paternity probability is compromised by a partner's sexual infidelity – men increase jealous mate-guarding [8].

Cognitively, relative to women, (viii) men preferentially process, and (ix) show greater memory recall of cues to sexual infidelity [9]. Relative to men, (x) women preferentially process, and (xi) show greater memory recall of, cues to emotional infidelity [9]. Upon discovery of infidelity, relative to women, (xii) men will find it more difficult to forgive a sexual infidelity than an emotional infidelity, and (xiii) will be more likely to terminate a current relationship following a partner's sexual infidelity than an emotional infidelity [10].

Both in his article [11] and book, with 45 pages devoted to jealousy, Buller ignores 11 of the 13 hypothesized sex-differentiated design features. He rejects the hypothesis that jealousy is an adaptation with sex-differentiated design features by attempting to discredit two of them (i and ii). Eggregiously, he misrepresents even these. He claims that the theory predicts that men 'respond primarily to cues of sexual infidelity' and women 'primarily to cues of emotional involvement'. Unfaithfulness is linked, of course, to a variety of fitness consequences, including paternity uncertainty (for men) and the total loss of a valuable partner. Whether these consequences follow depends on many factors. Thus, Buss *et al.* [4,5] were careful to state the prediction not in terms of absolute levels of jealousy, which are affected by many factors external to the hypothesis, but rather in *sex differences in sensitivities* to different forms of infidelity [4,5]. All the cross-cultural evidence Buller cites actually supports the *properly-framed* original hypotheses of sex

differences, although not Buller's mischaracterized versions.

A scientific evaluation of evolutionary hypotheses about jealousy requires an accurate characterization of the many hypothesized design features *and* a proper review of the large body of empirical findings pertinent to each. Buller's article and book fail on both counts. Buller's distorted depictions of others' hypotheses, and his failure to inform readers about numerous studies that contradict his claims, do not advance the science of the mind.

## References

- 1 Buss, D. (2000) *The Dangerous Passion*, The Free Press
- 2 Symons, D. (1979) *The Evolution of Human Sexuality*, Oxford University Press
- 3 Daly, M. *et al.* (1982) Male sexual jealousy. *Ethol. Sociobiol.* 3, 11–27
- 4 Buss *et al.* (1992) Sex differences in jealousy: evolution, physiology, and psychology. *Psychol. Sci.* 3, 251–255
- 5 Buss, D.M. *et al.* (1999) Jealousy and the nature of beliefs about infidelity: tests of competing hypotheses about sex differences in the United States, Korea, and Japan. *Pers. Relat.* 6, 125–150
- 6 Buss, D.M. *et al.* (2000) Distress about rivals: reactions to intrasexual competitors in Korea, the Netherlands, and America. *Pers. Relat.* 7, 235–243
- 7 Buss, D.M. and Shackelford, T.K. (1997) From vigilance to violence: mate retention tactics in married couples. *J. Pers. Soc. Psychol.* 72, 346–361
- 8 Gangestad, S.W. *et al.* (2002) Changes in women's sexual interest and their partner's mate retention tactics across the menstrual cycle. *Proc. R. Soc. Lond. Ser. B.* 269, 975–982
- 9 Schützwohl, A. and Koch, S. (2004) Sex differences in jealousy: the recall of cues to sexual and emotional infidelity in personally more and less threatening contexts. *Evol. Hum. Beh.* 25, 249–257
- 10 Shackelford, T.K. *et al.* (2002) Forgiveness or breakup: sex differences in responses to a partner's infidelity. *Cogn. Emot.* 16, 299–307
- 11 Buller, D.J. (2005) Evolutionary psychology: the emperor's new paradigm. *Trends Cogn. Sci.* 9, 277–283

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# The 'Cinderella effect' is no fairy tale

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In his polemic against 'evolutionary psychology', philosopher David Buller [1] tries to discredit not just its practitioners' theories, but their research findings as well, including our discovery that stepchildren are disproportionately mistreated. His denial of this abundantly verified 'Cinderella effect' (see <http://psych.mcmaster.ca/dalywilson/research.html>) goes beyond reasonable skepticism.

On the basis of comparative evidence and consideration of how natural selection works, we proposed long ago that step-parents might be overrepresented as child abusers, and analyzed US data, which confirmed the hypothesized

overrepresentation [2]. Buller asserts that 'the principal evidence cited in support' of this hypothesis is one city-level study of non-lethal abuse [3]. In reality, there are now dozens of confirmatory studies.

In one striking example, we reported that the rate of fatal beatings of Canadian preschoolers by (putative) genetic fathers between 1974 and 1990 was 2.6 per million children at risk per annum, whereas the corresponding rate for stepfathers was 321.6 per million [4]. Without acknowledging their magnitude, Buller dismisses such differences as possible artifacts of a recording bias in official records. This conjecture would require that every Canadian preschooler's death that was considered

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accidental, plus hundreds more that were blamed on specific diseases, were really disguised murders.

To bolster his speculations, Buller cites a Colorado study [5], which allegedly found that deaths at the hands of ‘unrelated persons including boyfriends’ were ‘8.71 times more likely to be recorded as maltreatment fatalities on death certificates’ than those committed by genetic parents. Even if this were accurate and generalizable, such a bias would fall far short of that required by Buller’s argument, but it is not accurate: the Colorado data indicate a 2-fold difference in initial recording rates (43% vs. 86%), not 8.71-fold. Moreover, ‘other relatives including stepparents’ had an initial recording rate (47%) scarcely different from that for genetic parents (43%), and the cases added after death review disproportionately involved negligence, not assault, making parents their ‘perpetrators’ by definition. More generally, Buller misrepresents the content of every study he cites, none of which documents any bias against step-parents in official records of lethal assaults, much less the immense bias that would be required to explain away the Cinderella effect.

Ignoring the data on fatal batterings in Canada and elsewhere, Buller focuses on one study of non-lethal abuse [3], and this, too, he distorts. He asserts, falsely and on no apparent basis, that the study’s case criterion encompassed relatively trivial negligence such as ‘failing to secure a child with a seat belt’. He suggests that sexual abuse distorts the picture and that analysis should have been confined to physical abuse, without mentioning that the Cinderella effect was clear and large within both. And he stresses that some US data yield a ‘significantly lower’ overrepresentation of step-parents. This is a red herring because no theory predicts that the Cinderella effect’s magnitude should be invariant, and it is a particularly pointless distraction given, first, that his US numbers are fully in line with our original results based on similar (but much larger) US samples [2], and secondly, that a bigger Cinderella effect is typically found when analysis is confined to more severe abuse cases, as it was in our

later study [3]. As we have stressed elsewhere [4], why Cinderella effects vary in magnitude is an important question for future research; Buller offers no suggestions.

Scrambling to portray evolution-minded research using diverse theoretical constructs and methods as a monolithic, wrong-headed ‘paradigm’, Buller obscures the distinction between empirical discoveries and the theoretical frameworks that motivate and guide them. Theories about the functional design of evolved social motives have inspired and directed our research on violence, helping us discover many hitherto unsuspected epidemiological facts [6–8], some of which concern violence against stepchildren. Buller’s attack won’t stop evolutionary psychologists from using contemporary thinking about adaptation and natural selection to help them generate fruitful hypotheses. But distorting what is known about family violence for rhetorical purposes could do real harm in the practical realm of child protection.

#### References

- 1 Buller, D.J. (2005) Evolutionary psychology: the emperor’s new paradigm. *Trends Cogn. Sci.* 9, 277–283
- 2 Wilson, M.I., Daly, M. and Weghorst, S.J. (1980) Household composition and the risk of child abuse and neglect. *J. Biosoc. Sci.* 12, 333–340
- 3 Daly, M. and Wilson, M.I. (1985) Child abuse and other risks of not living with both parents. *Ethol. Sociobiol.* 6, 197–210
- 4 Daly, M. and Wilson, M. (2001) An assessment of some proposed exceptions to the phenomenon of nepotistic discrimination against stepchildren. *Ann. Zool. Fennici* 38, 287–296
- 5 Crume, T.L. *et al.* (2002) Underascertainment of child maltreatment fatalities by death certificates, 1990–1998. *Pediatrics* 110, e18 (DOI: 10.1542/peds110.2.e18)
- 6 Daly, M. and Wilson, M. (1988) *Homicide*, Aldine de Gruyter
- 7 Wilson, M. and Daly, M. (1998) Lethal and nonlethal violence against wives and the evolutionary psychology of male sexual proprietariness. In *Rethinking Violence against Wives* (Dobash, R.E. and Dobash, R.P., eds), pp. 199–230, Sage
- 8 Daly, M. and Wilson, M. (2001) Risk-taking, intrasexual competition, and homicide. *Nebraska Symposium on Motivation* 47, 1–36

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#### Letters Response

## The emperor is still under-dressed

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#### Reply to Cosmides *et al.* (CTFB), by Buller and Fodor

CTFB [1] miss the main point. The ‘Buller–Fodor hypothesis’ concerns only the logical form of mental representations of obligation rules [2]. A subject’s performance on reasoning tasks is determined by *his/her*

*mental representation of the logical form* of the stimulus material (for Wason tasks, a ‘conditional rule’), not by its surface grammar. The mental representation of logical form is, in turn, a function of contextual variables, including background information ([3], p. 279). Predicting performance on a reasoning task thus requires information about both the stimulus material and the factors that influence how subjects interpret it.

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