COMMENTARY

CORRELATION COEFFICIENTS AS EVIDENCE OF FEMALE PREFERENCE FOR SIZE OF MATE

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Warkentin et al. (1992) found a positive correlation between the tail lengths of male and female in mated pairs of Merlins (*Falco columbarius*). They found it interesting that there was no negative assortment of matings by size and further noted that selection of larger males would be unexpected according to most theories of reversed sexual dimorphism in size.

A negative correlation between the sizes of mates can result only if large females mate with small males *and* small females mate with large males. A general preference of females for small males can produce such a correlation only if large females choose first, and small females accept as mates the large males remaining. The rule governing female choice of size of male, the order in which the sizes of females exercise their choice, and the amount of sexual dimorphism existing in the population all can affect the correlation coefficient between the sizes of mates (Table 1).

Warkentin et al. (1992) appear to interpret the positive correlation in tail length between the sexes as a preference by females for long-tailed males. A positive correlation in tail length between males and females can result from a general female preference for long tails if long-tailed females choose first (the inverse of the first line in Table 1). The means and standard deviations given in Warkentin et al. (1992) suggest that fewer than 3% of the females would have tail lengths shorter than any male and thus females cannot select males with tail lengths longer than theirs. The positive correlation observed by Warkentin et al. could result if females selected males with tail lengths at least a given amount *shorter* than theirs, regardless of what size of female selects first (cf. Table 1). Thus, the hypothesis of Warkentin et al. can be falsified by showing that long-tailed females are not the first to choose mates, but if long-tailed females do choose first, it remains possible that they are selecting males with tails at least a given amount shorter than theirs.

Correlation coefficients between the sizes of the sexes are not completely appropriate for determining the choice of females because the tests assume that each pair bond is formed independently, and because the pair bond may also reflect male choice of female and the results of male-male competition for access to females (Johnson and Marzluff 1990). Correlation coefficients should be interpreted with great care. A preference for large males *is* unexpected according to most theories of reversed sexual dimorphism in size, but a positive correlation coefficient between the sizes of the sexes is not necessarily evidence for such a preference.

LITERATURE CITED

JOHNSON, K., AND J. M. MARZLUFF. 1990. Some problems and approaches in avian mate choice. Auk 107:296-304.

WARKENTIN, I. G., P. C. JAMES, AND L. W. OLIPHANT. 1992. Assortative mating in urban-breeding Merlins. Condor 94:418-426.

TABLE 1. Female choice, sexual dimorphism and correlation in size between members of pairs.

Female decision	Choosing female order	Sexual dimorphism	Correlation between sexes
Rule: select male			
Smallest available	Largest first	Any dimorphism	Negative
	Smallest first		Positive
	Random		None
At least given amount smaller than you	All orders	Any dimorphism	Positive
Smaller than self	All orders	Great	None
		Slight	Positive