The Operational Sex Ratio, the Potential Reproductive Rate and the Opportunity for Sexual Selection.

Stephen M. Shuster, Department of Biological Sciences, Northern Arizona University, Flagstaff.

Many researchers have attempted to quantify the intensity of sexual selection using estimates of a species' operational sex ratio (OSR), or of its potential reproductive rate (PRR). In general, these measures include only those individuals who are sexually receptive at a particular time and place, or whose maximum rate of reproduction can be experimentally manipulated. Here, I show that the practice of including certain individuals and excluding others in such procedures can cause errors in estimates of the sex difference in the variance in relative fitness; i.e., in the opportunity for sexual selection. I also show that, depending on the consistency of individual mating success within the breeding season, high and low values of OSR can lead to identical estimated intensities of mating competition. Lastly, I show how the contributions, of local variation in sex ratio, and the consistency of individual mating success, to the opportunity for sexual selection, can be specifically identified by partitioning the distribution of successful matings into spatial and temporal components. Because estimates of OSR and PRR can provide incomplete or erroneous information about sexual selection, and because the opportunity for sexual selection can be measured with considerable precision, I conclude that the opportunity for sexual selection is a more reliable estimator of sexual selection's intensity than either OSR or PRR.