

Sexual Selection and Mating Systems

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Sexual selection is among the most powerful of all evolutionary forces. It occurs when individuals of one sex secure mates at the expense of other individuals of the same sex. Darwin was first to recognize the power of sexual selection to change male and female phenotypes, and, in noting that sexual selection is not ubiquitous, Darwin was also first to recognize the importance of mating system - the particular circumstances in which reproduction occurs within species. It is in this context that sexual differences arise - or do not. Analyses of mating systems since Darwin have emphasized either the genetic relationships between males and females, or the numbers of mates males and females may obtain. Combining these schemes yields a quantitative methodology that emphasizes measurement of the sex difference in the variance in relative fitness, as well as genetic correlations underlying reproductive traits that may arise among breeding pairs. Such information predicts the degree and direction of sexual dimorphism within species, and allows the classification of mating systems using existing genetic, life history and behavioral data. This empirical framework focuses on evolutionary processes, and thus seeks to identify selective forces and genetic architectures responsible for observed male-female differences. This approach compliments ongoing discoveries of nucleotide sequence variation and the expression of quantitative traits. Moreover, because this methodology emphasizes the process of evolutionary change, it is easier to test and interpret than frameworks emphasizing optimal evolutionary outcomes, in particular those arising from sex differences in initial parental investment.