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Invited Commentary

Two faces of environmental effects on mate choice: a comment on Dougherty and Shuker

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Dougherty and Shuker (2014) provide a very useful analysis of the impact of experimental design on estimates of the strength of mate choice preferences. Contrasting paired “no choice” and “choice” designs, their main finding is that choice designs yield estimates of stronger choice. In light of these results, one needs to be careful in the interpretation of choice versus no choice tests. In addition to the specifics of experimental design, in a more general sense, they report evidence for environmental effects (in this case, social environment) on the strength of sexual selection. We see 2 important implications of their findings. First, as the authors note, we should take great care when designing studies of mate choice if our goal is to project our conclusions to natural populations or to make quantitative predictions about how mate choice translates into selection on male traits. If either is our aim, we need to rely on field studies or experimental studies conducted under settings that closely mimic those in the wild. Second, we can gain important insights from studies that focus on how local environmental conditions impact the strength of mate choice or, more generally, sexual selection. Dougherty and Shuker (2014) emphasize the role of mate rejection costs in accounting for the reduced degree of female choice expressed in the no choice tests. In turn, if a role for mate rejection costs is demonstrated, it will yield insights into the economics of mate choice. For example, perhaps the high cost of rejecting a mate in males, where variance in mating success can be so high, accounts for the tendency of male choice to vary little between choice and no choice formats.

Like cognitive constraints and mate rejection costs effects on the outcome of no choice versus choice experiments, factors such as the risk of predation, resources, light, and density are known to affect the economics of mating and the strength of mate choice (Emlen and Oring 1977; Rowe et al. 1994; Candolin and Heuschele 2008; Fricke et al. 2009). If we can understand the impact of some set of environmental factors on the strength of choice, we have arguably

gained some level of understanding of the factors that shape the evolution of choice.

These 2 messages are somehow daunting and encouraging at the same time. Daunting because the known sensitivity of choice to so many elements of the social and physical environment means that predictions about the role of mate choice in shaping a trait or set of traits can be fragile and fleeting. Encouraging though, because understanding these environmental sensitivities is the first step to an understanding of the forces of selection that have shaped male and female mating biases, and it is a lack of understanding here that remains the most enduring puzzle in the field of sexual selection (Kirkpatrick 1987; Andersson 1994; Arnqvist and Rowe 2005).

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REFERENCES

- Andersson MB. 1994. Sexual selection. Princeton (NJ): Princeton University Press.
- Arnqvist G, Rowe L. 2005. Sexual conflict. Princeton (NJ): Princeton University Press.
- Candolin U, Heuschele J. 2008. Is sexual selection beneficial during adaptation to environmental change? *Trends Ecol Evol.* 23:446–452.
- Dougherty LR, Shuker DM. 2014. The effect of experimental design on the measurement of mate choice: a meta-analysis. *Behav Ecol.* xx:xx–xx.
- Emlen ST, Oring LW. 1977. Ecology, sexual selection, and the evolution of mating systems. *Science.* 197:215–223.
- Fricke C, Perry J, Chapman T, Rowe L. 2009. The conditional economics of sexual conflict. *Biol Lett.* 5:671–674.
- Kirkpatrick M. 1987. The evolutionary forces acting on female mating preferences in polygynous animals. In: Bradbury JW, Andersson MB, editors. *Sexual selection: testing the alternatives*. New York: Wiley. p. 67–82.
- Rowe L, Arnqvist G, Sih A, J Krupa J. 1994. Sexual conflict and the evolutionary ecology of mating patterns: water striders as a model system. *Trends Ecol Evol.* 9:289–293.