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Family planning under social competition

Rienk Fokkema

1. Negative density dependent reproduction as observed in many populations has been mostly explained by mechanisms linked to the benefits of reproduction¹. I propose that the cost of reproduction may also play an important role in the evolutionary explanation of density dependent reproduction².
¹ Kluijver, H. 1951. *Ardea*. 1. 1-135. Krebs, J.R. Perrins, C.M. 1978. Behaviour and population regulation in the great tit (*Parus major*). In *Population control by social behaviour*. Institute of Biology, London; Both, C et al. 1999. *Proc.R.Soc.Lond.B*. 1418.465-469; Sinervo, B. Svensson, E. 2000. *Nature*. 406. 6799. 985-988
² This thesis
2. The individual optimization approach led to a better understanding of the adaptive background of phenotypic variation in clutch size¹. Accumulating evidence however indicates that the term individual optimization is misleading because social aspects play a crucial role in determining the optimal decision, and therefore a game theoretical approach² is more appropriate.
¹ Verhulst, S.1995.Reproductive decisions in great tits – An optimality approach. Thesis propositions. University of Groningen
² This thesis, Smith, M. 1982. *Evolution and the theory of games*. Cambridge university press. Wilson, A. 2014. *Heredity*. 112. 70-78; Svensson, E. & Sheldon, B.C. 1998. *Oikos*. 83. 466-477; Lancaster, L.T. & Sinervo, B. 2011. *Chapter 25 in Mechanisms of Life History Evolution*. Editors: Flatt, T. Heyland, A. Oxford university press, Oxford; Both, C et al. 1999. *Proc.R.Soc.Lond.B*. 1418. 465-469
3. Study populations aimed at investigating the fitness consequences of reproduction should allow rather than prevent predation.
Chapter 3, 4 and 5 of this thesis
4. To resolve the debate on whether cavity breeding birds are limited by the number of cavities, research should focus on cavity quality rather than only on cavity quantity.
Dhondt, A.A. 2011. *Chapter 5 in Interspecific competition in birds*. Oxford Avian Biology Series. Oxford University Press, Oxford
5. While meta-analyses have provided great insight in the general trends in life history trade-offs, the variation in these trends is mostly neglected. We need a better focus on the ecological variation within species, to provide crucial insights into the life history trade-offs.
6. Fitness effects of trait variation should be estimated using experimental manipulation of the trait value. However, it is impossible to address all aspects of the trait variation using experiments. In such cases knowledge of the (ecological) mechanisms underlying the fitness effects of experimental variation is a promising route to predict selective pressures acting on trait variation.
7. The economic incentive to invest in creating more PhD opportunities at Dutch universities is traded-off against the quality of education for the PhD students.
8. Scientists should not feel offended when criticized on their research by fellow scientists, but welcome it. As Alexander von Humboldt already said in 1828: “Without a diversity of opinion, the discovery of truth is impossible”
Wulf, A. 2015. *The invention of Nature – The adventures of Alexander von Humboldt – The lost hero of science*. John Murray (publishers), London