

The impact of winner and loser effects on competitive performance

Supervisory team:

Main supervisor: Dr Tim Fawcett (University of Exeter)

Second supervisor: Prof Alastair Wilson (University of Exeter)

Dr Rachel Arnold (University of Bath), Dr Mark Wilson (University of Exeter)

Collaborators: Prof Andy Radford (University of Bristol)

Host institution: University of Exeter (Streatham)

Project description:

Winner and loser effects, in which the experience of winning or losing a contest affects the ability to win future contests, are widespread across the animal kingdom. Experiences of victory and defeat precipitate a range of physiological and behavioural changes that make winners more likely to win again and losers to carry on losing. Recently, evolutionary biologists have argued that similar effects exist in human sport and may underlie winning and losing 'streaks', but their true impact on performance is unknown. Sports databases are a valuable resource for investigating winner and loser effects because they allow changes in performance to be quantified across an athlete's entire career, providing richer longitudinal information than is possible in most animal studies. This PhD project will exploit these data to address basic biological questions about the impact of winner and loser effects on competitive interactions, the factors that influence their magnitude and their role in driving behavioural variation. The project will combine in-depth statistical analysis of sports databases, evolutionary modelling of adaptive contest behaviour and measurement of psychophysiological responses to victory/defeat in current athletes, shedding light on the functional basis and mechanistic underpinnings of winner and loser effects. Specific research questions include the following:

- How does the impact of winning and losing change with age?
- Do male and females respond differently to victories and defeats?
- Does the magnitude of a win/loss alter the impact of winner/loser effects?
- What is the cumulative impact of a sequence of wins or losses?
- What are the psychological and biochemical changes underlying these effects?

Advanced statistical techniques, based on generalised linear mixed models (GLMMs), will be used to analyse existing sports data and disentangle the direct psychological impact of winning and losing from other fluctuations in form. The data analysis will be guided by testable predictions from evolutionary models of contest behaviour that focus on the adaptive benefits of winner and loser effects. The student will also collect new longitudinal data from a sample of sub-professional athletes, using questionnaires and biochemical measurements taken pre- and post-event, to examine psychophysiological responses to victory and defeat. This integrative approach will provide new insights into the biological basis of winner and loser effects and reveal potential mechanisms underpinning the changes observed.