# Reproductive dispersion and damping time scale with life-history speed

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## Abstract

Generation time has previously been the focus of comparative life history analyses. Here we examine three metrics: generation time $T_c$, reproductive dispersion $S$ (the distribution of ages of reproduction), and damping time $\tau$ (time to converge to stable (st)age distribution). We use data on 633 species of animals and plants, and perform phylogenetically corrected analyses. First we find that $S$ varies allometrically and isometrically with $T_c$. As a result, $\tau$ varies allometrically with either $T_c$ or $S$ but not both. Second, we find a trade-off between $\tau$ and $S$, so that $\tau$ does not vary isometrically with $T_c$. This trade-off is a novel demographic component to the relationship between $\tau$, $T_c$ and $S$ that is otherwise partly determined by their similarity as biological times. Our results indicate that species at the slow end of the slow-fast continuum take longer to converge to stable distribution than species with fast life-histories.

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