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Evolutionsbiologie

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Born in 1973 in Ulm
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FELLOWSHIP
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ARBEITSVORHABEN

Variabilität in individuellen Fitnesskomponenten

Humans and other species often differ greatly in age at death and in lifetime reproduction. For example, the standard deviation of human age at death was _40% of life expectancy (_35 years) in the early 1800s and _20% in the late 1900s even with a much higher life expectancy (_70 years). This leads to the question why there is so much variability and where does it come from. Does it have a genetic component, is it driven by the fluctuations in the environment, or is it simply chance that determines the course of life? To date, we have no good expectation of variability in fitness components and patterns across species and populations and we are far from quantifying underlying causes of this variability. The large variation in fitness components that is found on all levels, from bacteria to humans, has substantial implications for evolutionary and ecological population dynamics. It confronts us with major challenges in accurately forecasting population dynamics, including forecasts under climate change scenarios and major shifts in the demographic structure human societies face in the near future. I will review existing patterns across the tree of life using neutral theories of life histories to reveal potential unifying or diverging features in observed variability in fitness components among individuals. I will use a neutral theory of life histories that estimates expected neutral variability in individual fitness components within age- and stage-structured populations, assuming a single genotype. If expectations of large neutral variability (non-genetic variability) hold, life courses are mostly be determined by chance and we need not worry; we only need to be lucky.

Recommended Reading
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Tuljapurkar, S., U. K. Steiner, and S. H. Orzack (2009). "Dynamic heterogeneity in life-histories." Ecology Letters 12, 1: 93-106.

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Constraints on the evolution of phenotypic plasticity : limits and costs of phenotype and plasticity

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