

This Week's Citation Classic

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Stearns S C. Life-history tactics: a review of the ideas.

Quart. Rev. Biol. 51:3-47, 1976.

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This paper reviews the literature on life-history evolution through 1974 and organizes the field into a series of major areas. It underlines the importance of risk-avoidance in evolution, presents a novel classification of fluctuating environments, and calls for experimental tests of major predictions. [The SCI® indicates that this paper has been cited in over 410 publications since 1976.]

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"When I arrived in Vancouver in January 1972 to begin work on my PhD, I went to talk to Peter Larkin about my plans. I told Larkin that I wanted to do field manipulation experiments of hypotheses on community structure. He disagreed. He told me that there were many other people doing that, and that I might be capable of something more original. He told me to take the next year to think about things, to read widely, and to avoid taking courses or starting a research project. My major professor, Conrad Wehrhahn, agreed with Larkin. I took the advice, wrote this paper as the introduction to my PhD proposal, and it changed my life.

"I began by casting my net very widely, reading on the evolution of practically anything that presented interesting comparative patterns. I soon realized that I could not single-handedly summarize all of what was to become evolutionary ecology, and restricted

my attention to the evolution of life-history traits, especially age-at-maturity, clutch size, reproductive effort, number of reproductive events per lifetime, and longevity. There was no one on the faculty at the University of British Columbia who was expert in these matters, although several professors were interested, so Ric Charnov and I gave a seminar course on life-history evolution in the fall of 1972. Several professors and about 15 graduate students attended. The work that I did for that course, and the frequent conversations I had with Charnov, Don McPhail, Wehrhahn, Carl Walters, Dennis Chitty, Bill Neill, and John Krebs helped to organize the paper.

"I believe the paper is cited for five reasons. First, it provided a timely, critical review at the start of the rapid growth of the specialty to which it refers. Second, it was published in *Quarterly Review of Biology*, which is read by people in many fields. Third, it provided a coherent framework on which to hang the diverse ideas extant in the literature. In this respect, it is beginning to outlive its usefulness. Fourth, it emphasized the role of risk-avoidance in evolution and gave it a catchy label, 'bet-hedging.' Fifth, it provided a novel classification of fluctuating environments. I have asked five or six colleagues why they cite this paper. About half of them report that they find the citation an easy way to review the literature. The rest emphasize the critical qualities of the paper. I find in rereading it that I am impressed by my energy at 26 and 27, and embarrassed by the brash arrogance with which I dissected papers whose intrinsic value has since grown on me.

"Brian Charlesworth recently wrote an excellent book in this area,¹ and I have written three reviews that provide entry to the more current literature."²⁻⁴

1. Charlesworth B. *Evolution in age-structured populations*. London: Cambridge University Press, 1980. 300 p.
2. Stearns S C. A new view of life-history evolution. *Oikos* 35:266-81, 1980.
3. The role of development in the evolution of life histories. (Bonner J T, ed.) *Evolution and development*. Berlin: Springer-Verlag, 1982. p. 237-58.
4. The emergence of evolutionary and community ecology as experimental sciences. *Perspect. Biol. Med.* 25:621-48, 1982.