Different approaches to modeling foraging and predator-prey games among animals

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Theoretical models may not provide proofs that we reached full understanding of the system, but they can generate testable hypotheses and predictions and can assist in the understanding of experimental results. Here I describe different modeling approaches we have used to investigate animal decisions in regard to foraging under the risk of predation. In the first, we interpret the escape strategy of a lizard from an avian predator with a simple decision tree model. In the second system, games between rodents and their predators can be constructed in two different approaches. A static game has the advantage of simplicity. It can often be solved analytically and the results are relatively easy to interpret. Nevertheless, the simplicity has its costs in terms of realism. Some simplifications embedded in the static approach can be relaxed in a dynamic state-variable game model, and the predictions of such a model will be compared to results of a field study conducted in collaboration with Burt Kotler.

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