

## **Bayesians, frequentists, and pragmatists: the interaction of methods and software.**

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**Abstract:** Ecologists take pride in statistical pragmatism, doing "whatever works." I will attempt to unpack this sense of pragmatism specifically for hierarchical statistical models and look at how it involves a swirl of principles and practices. Moreover, one's sense of pragmatism depends on available software, yet the statistical literature abounds with ideas for numerical methods for hierarchical model estimation, prediction, and diagnostics that are not readily available in software. One simple goal in principle would be to critically evaluate Bayesian results from a frequentist perspective, but this is rarely done because it is not practical. Some complex algorithms for some hierarchical models are available, while some simple algorithms are not. Therefore, the future of pragmatism is tied to the future of software. I will present progress on a new software package that allows flexible programming of algorithms that operate on shared model structures. This means that rather than tying specification of a model structure to a particular algorithm, such as one flavor of MCMC provided as a "black box", one can specify a model structure and run a variety of algorithms on it. Since algorithms can be concisely programmed, the system is naturally extensible and provides a way to disseminate new methods.