ADVANCED BAYESIAN MODELING

Sensitivity Analysis

So far, we have assumed our Bayesian models are fully correct.

How can we check

- Sensitivity to the prior specification?
- The data modeling (sampling distribution) assumptions?

Main concern not correctness, but practical adequacy.

Sensitivity Analysis

Commonly, Bayesian **sensitivity analysis** is assessment of how much posterior inferences change under reasonable changes to the prior.

(Changes can be at any level of prior hierarchy.)

BDA3 expands this definition to include changes to the sampling model (likelihood) and even the selection of data.

Changes to posterior inference that have clear practical implications should prompt re-examination of Bayesian model.

Examples of situations for sensitivity analysis:

- Trying proper but increasingly vague (flatter) priors to determine if and when they become essentially noninformative
- Trying different choices for intermediate distributions in a hierarchical prior
- Trying different parameterizations
- Trying a more general sampling model (adding a parameter)