* Explain nuisance parameters
* How to deal with them
* What the authors recommend
* Give example in binomial

A complete quantitative description of experimental data not only requires a model of the intrinsic processes of interest, but also of the noise.

The process of creating a statistical model of experimental observations frequently boils down to the construction of a likelihood function, which, loosely put, gives the probability of the observed data given the parameters of our model.

The likelihood function forms the basis for great deal of statistical inference techniques. For example, one could estimate the parameters of the model by maximizing the likelihood. The problem is, likelihood functions often contain more parameters than we care about. The inexplicable or uninteresting noise that buffet processes of interest have to be parameterized and accounted for in the likelihood function. As Berger et al. discuss, the existence of so called ‘nuisance parameters’ severely hampers inference in many cases. They review a few of the common frequentist techniques for dealing with nuisance parameters in likelihood functions, but fall strongly in favor of integrating the likelihood function over the nuisance parameters. Although this method has a very Bayesian flavor to it, the authors emphasize the pragmatic benefits of integrated likelihoods.

even for statisticians with frequentist inclinations.

with the outputs of the inherent process we’re trying to model are buffeted by either inexplicable or uninteresting noise.

If the model is parametric, it’ Often this boils down to construction of a likelihood function, which is best summarized as the probability of the data given

Scientists have inexorable to model observations. Models

Much of statistical inference boils down to the construction of the likelihood function. For a given model, the likelihood function can be thought of loosely as the probability of the observation given the parameters of the model.