STAT 535: Chapter 8(a):
In Which the Class Enjoys a Brief Yet Fascinating Interlude to Discuss Prior Elicitation

David B. Hitchcock
E-Mail: hitchcock@stat.sc.edu

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Prior Elicitation

- A challenge is putting "expert opinion" into a form where it can be used as a prior distribution.
  Strategies:

- Requesting guesses for several quantiles (maybe {0.1, 0.25, 0.5, 0.75, 0.9}?) from a few experts.

- For a normal prior, note that a quantile $q(\alpha)$ is related to the z-value $\Phi^{-1}(\alpha)$ by:

$$q(\alpha) = \text{mean} + \Phi^{-1}(\alpha) \times (\text{std. dev.})$$

- Via regression on the provided $[q(\alpha), \Phi^{-1}(\alpha)]$ values, we can get estimates for the mean and standard deviation of the normal prior.

Prior Elicitation

▶ Another strategy asks the expert to provide a "predictive modal value" (most "likely" value) for the parameter.

▶ Then a rough 67% interval is requested from the expert.

▶ With a normal prior, the length of this interval is twice the prior standard deviation.

▶ For a prior on a Bernoulli probability, the "most likely" probability of success is often "clear".