Linking data to parameters

Applying Bayesian statistics to real-world problems

Welcome to the third workshop of the BayesCog course!

In this workshop, we'll build on our understanding of probability and Bayes' theorem to explore how we can **construct and implement Bayesian models**. We'll start with a simple but powerful example - **the binomial model** - and use it to demonstrate key concepts in Bayesian modeling. We will explore the computational burden of Bayesian statistics - calculating posterior distributions - first through grid approximation, before exploring **Markov chain Monte Carlo (MCMC)** methods - powerful computational techniques which allow us to sample from complex posterior distributions that would be impossible to compute directly.

Topics for this workshop include:

- Understanding how data and parameters are linked in Bayesian inference
- Learning about likelihood functions and how to choose them
- Exploring the binomial model through a practical example
- Using grid approximation to estimate posterior distributions
- An introduction to Markov chain Monte Carlo

> **i** Working directory for this workshop
>
> Model code and `R` scripts for this workshop are located in the (`/workshops/02.binomial_globe`) directory. Remember to use the `R.proj` file within each folder to avoid manually setting directories!

The copy of this workshop notes can be found on the course GitHub page.