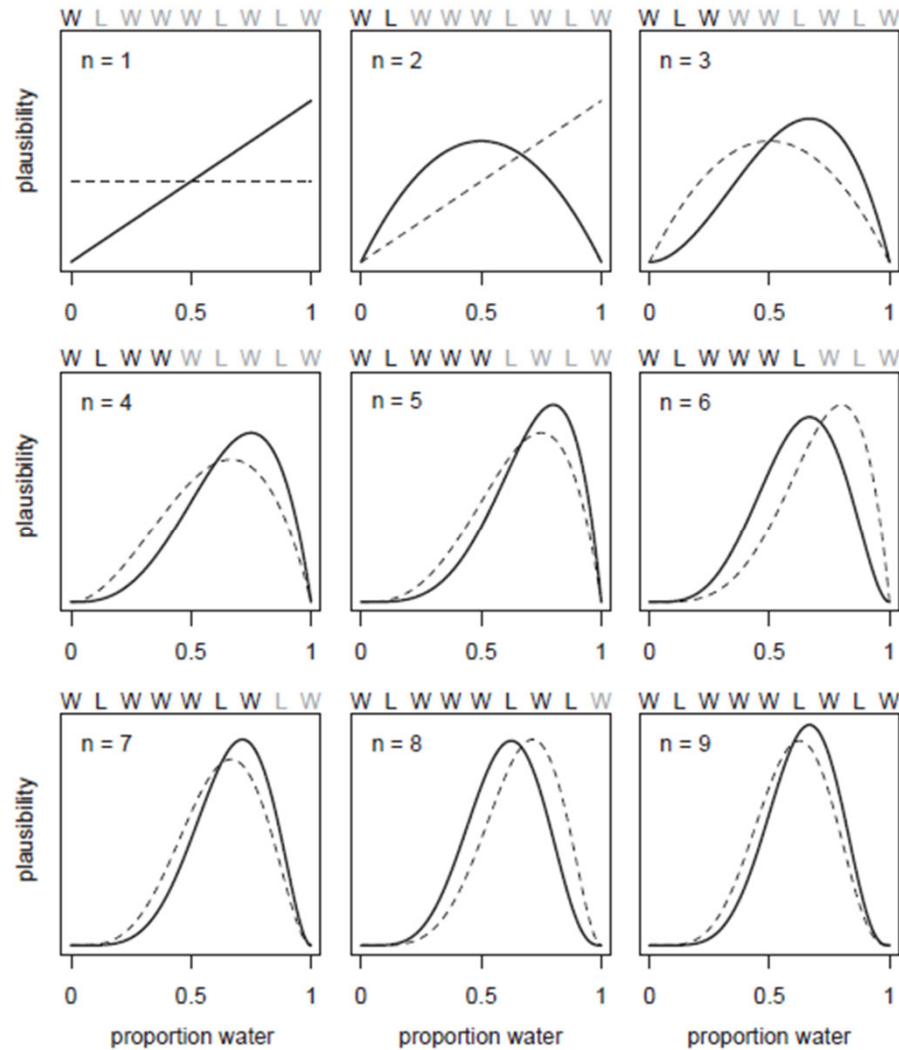# Main concepts McElreath 2

- Golem = algorithm
- Likelihood: counting all the ways data could have happened
- Bayesian updating: prior x likelihood
  - using counts
  - using probabilities
  - using distributions

Bayesian updating

Components of model

1) Likelihood
   - "data story" = data generating process
   - first principles or "off the shelf"

2) Parameters
   - quantities that don't change
   - to be estimated

3) Prior distribution

4) Posterior distribution
   - histogram *is* the posterior

Bayesian inference

$$P(B \mid A) = \frac{P(B)P(A \mid B)}{P(A)}$$

Bayes' rule for two events A, B

$$P(\theta \mid y) = \frac{P(\theta)P(y \mid \theta)}{P(y)}$$

"Posterior"

Model   Data

"Prior"   Constant   Likelihood

Apply Bayes' rule to convert the likelihood into what we really want to know: the probability of the model given the data

$P(y)$: Total probability of the data: the probability added up or integrated over all of the models.