Persuading reviewers and editors to publish Bayesian analyses

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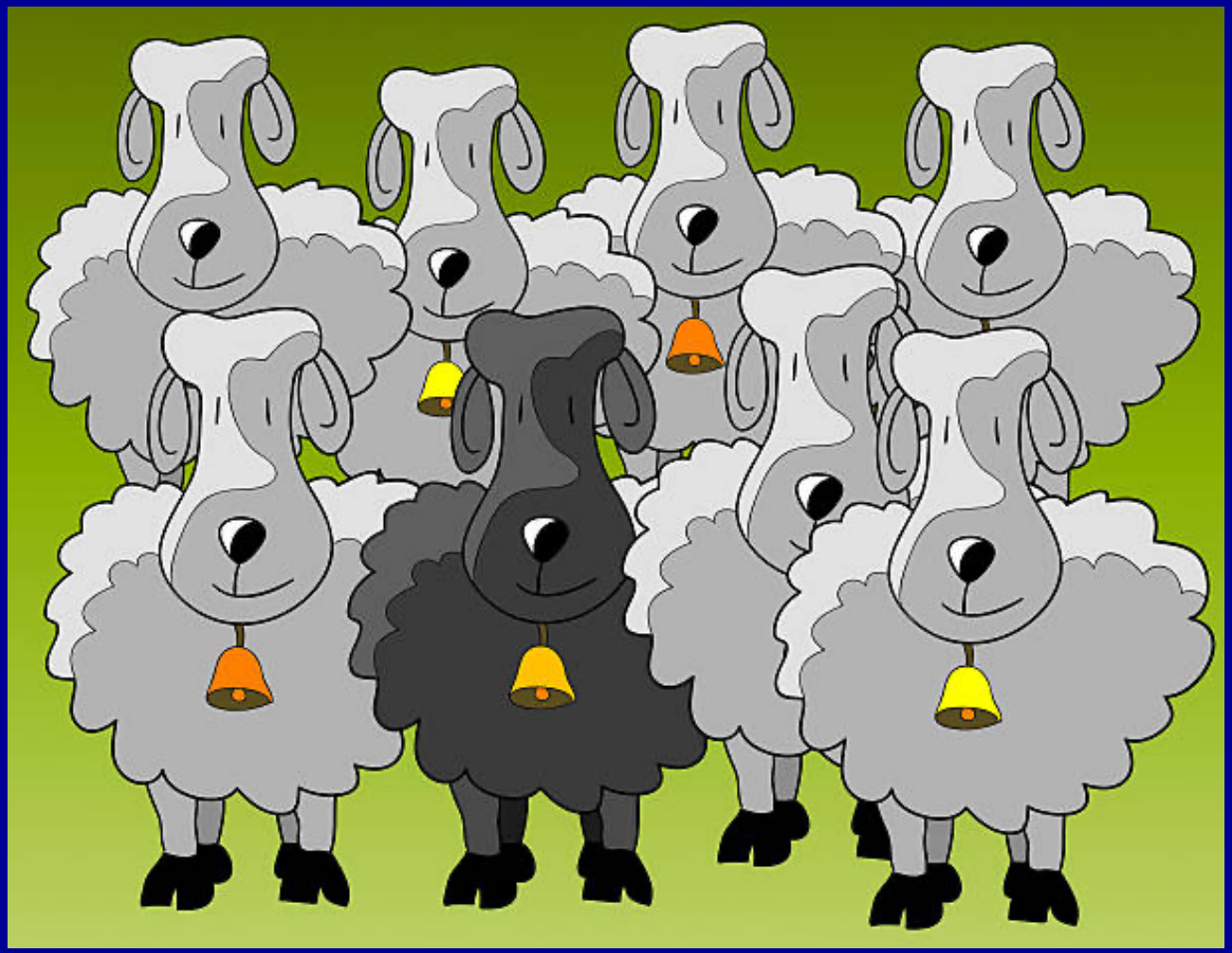
Three challenges coming from readers' expectations

Bayesian analyses violate three expectations:

1. Readers expect statistical significance tests.
2. Readers expect null hypotheses.
3. Readers expect very simple findings – significant or not?

Unusual methods may seem wrong

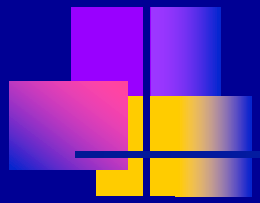


Readers expect analyses to be traditional and familiar

- But Bayesian analyses are untraditional and unfamiliar.
- Reviewers will wonder why you are deviating from tradition.

So, make your analyses very easy to understand

- Use graphs! Graph your prior and posterior distributions, perhaps on the same graph.
- Use concrete examples that relate to everyday events.
- Do not ask readers to interpret algebraic formulas.



Readers expect null hypotheses.

- But Bayesian analyses use prior distributions instead of null hypotheses.
- You can explain how priors are better than null hypotheses.

Explain that a prior distribution is not a null hypothesis

- Null hypotheses pay no attention to previous research or to knowledge about the phenomena.
- Priors are starting points for data analysis that can take advantage of previous research.

3 ways a prior distribution is better than a null hypothesis

- 1. Priors allow choices about assumptions.
  - For example, significance tests usually assume that data distributions are Normal.
  - Perhaps give reasons why conventional assumptions may be incorrect in your study.

3 ways a prior distribution is better than a null hypothesis (continued)

- 2. Modern Bayesian software allows prior distributions of many kinds.
- Explain how your prior distribution makes your inferences more accurate by taking account of previous studies or good theory.

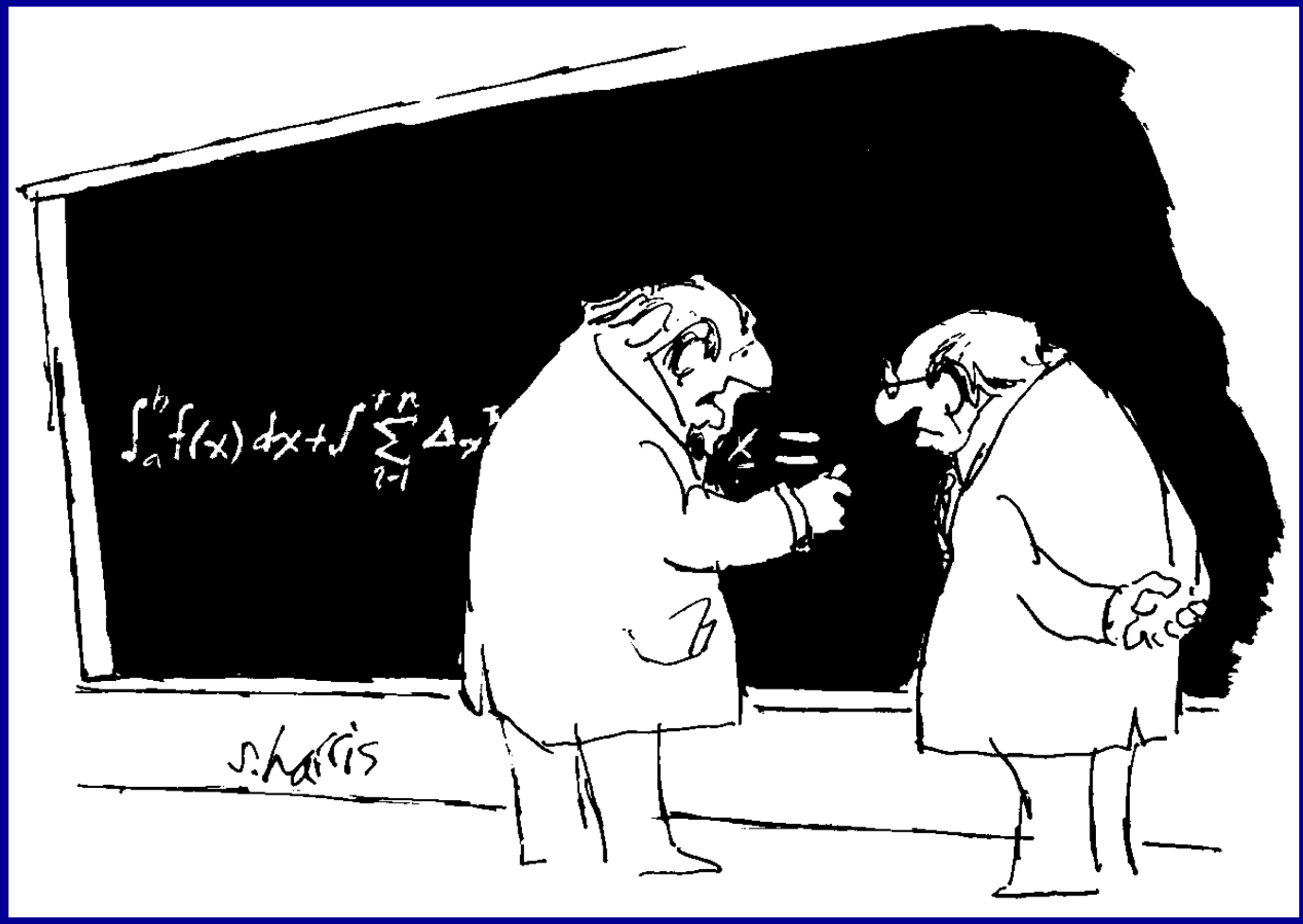
3 ways a prior distribution is better than a null hypothesis (continued)

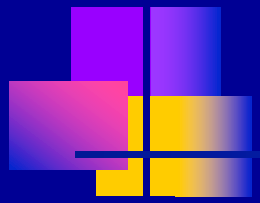
- 3. Larger samples weaken the effects of prior assumptions.
- Perhaps show the different effects of two priors, hence a range of interpretations.

Readers expect simple yes-or-no conclusions about statistical significance.

- Bayesian analyses produce posterior distributions, which describe ranges of alternative conclusions.

"This is the part I always hate."





So, explain why a posterior distribution is more useful than just saying significant or not

- Inferences always have some uncertainty because data are samples rather than complete populations. Posterior distributions show this sampling uncertainty.

Explain why a posterior distribution is more useful (continued)

- Posterior distributions also show the likelihoods of different possible inferences, which is more complete information than estimates of average effect sizes.