Bayesian Methods: Some Myths

Myth 1

- p-values etc are irredeemably flawed and the only correct way to statistically analyse data is with Bayesian methods
- While Bayesian methods offer real advantages, both practical and conceptual, classical methods and p-values etc are neither practically useless or conceptually flawed.

Myth 2

- Classical and Bayesian methods are mutually exclusive.
- Both approaches can be used without conceptual or theoretical inconsistency.

Myth 3

- p-values do not tell the probability the (null) hypothesis is true, but Bayesian methods can tell you this.
- Bayesian methods allow you to make probabilistic statements about hypothesis etc, *but* these are all contingent on all the assumptions being correct.

Myth 4

- The misuse of p-values etc led to the replication crisis. Bayesian methods are needed to solve this crisis.
- The misuse of p-values did not lead to the replication crisis. Bayesian methods can be misused too and you can “p hack” with Bayes too.

Myth 5

- In classical methods, we test (null) hypothesis with p-values. In Bayesian methods, we test (null) hypotheses with Bayes factors.
- Bayes factors do not need to be used at all. They are not the defining feature of Bayesian methods. Also, Bayes factors are as prone to misunderstanding and misuse as p-values.

Myth 6

- Classical methods let the data do the talking. Bayesian methods are inherently subjective.
- In both cases, we reason on the basis of models that are based on data and background assumptions.

Myth 7

- Bayesian methods will never catch on.
- Bayesian methods have already caught on.