Bayesian First Aid: A Package that Implements Bayesian Alternatives to the Classical `*.test` Functions in *R*
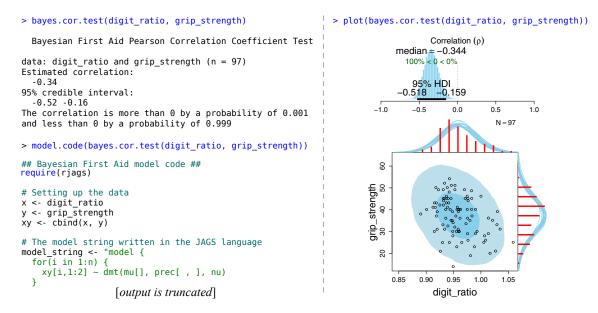
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This talk will introduce **BayesianFirstAid**[1], an R package that implements Bayesian alternatives to the most commonly used statistical tests. It is inspired by the **BEST** package [2] and is similarly intended both as a practical tool and as a teaching aid. A main feature of the package is that the Bayesian alternatives are called in the same way as the corresponding classical test functions, save for the addition of `bayes.` to the beginning of the function name. For example, if `binom.test(x=7, n=10)` runs a classical binomial test then `bayes.binom.test(x=7, n=10)` runs the Bayesian alternative. This makes the package easy to pick up and use, especially if you are already used to the classical `*.test` functions, and it also facilitates comparing the output of the different approaches. All models are implemented using the JAGS modeling language, called from R using the **rjags** package. The generic function `model.code` makes it straightforward to start modifying the models underlying the package. It takes a **BayesianFirstAid** object and prints out the underlying model code which is ready to be copy-n-pasted into an R script and tinkered with from there. All **BayesianFirstAid** objects have default `plots` that show the posteriors of the parameters of interest together with a display that enables a quick posterior predictive check.

Below is an example of the output from the Bayesian First Aid alternative to `cor.test(...)`. The data is the hand grip strength (in kg) and index / ring finger ratio for the male group in [1].

References

[1] Hone, L. S. and M. E. McCullough (2012). 2d: 4d ratios predict hand grip strength (but not hand grip endurance) in men (but not in women). *Evolution and Human Behavior 33*(6), 780–789.

[2] Kruschke, J. K. (2013). Bayesian estimation supersedes the t test. *Journal of Experimental Psychology: General 142*(2), 573.

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[1]The **BayesianFirstAid** development can be followed at https://github.com/rasmusab/bayesian_first_aid