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## Assessing replication success via skeptical mixture priors

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There is a growing interest in the analysis of replication studies of original findings across many disciplines. When testing a hypothesis for an effect size, two Bayesian approaches stand out for their principled use of the Bayes factor (BF), namely the replication BF (Verhagen and Wagenmakers, 2014) and the skeptical BF (Pawel and Held, 2022). In both cases replication data are used to compare an “advocacy” prior against a benchmark. For the replication BF, the latter is the standard point null hypothesis of no effect while for the skeptical BF it represents the prior of somebody who is unconvinced by the original findings. We propose a novel skeptical mixture prior which incorporates skepticism and limits prior-data conflict. We support our proposal with theoretical results on consistency of the resulting BF, we illustrate its features on an extended example, and we apply it to case studies from the Social Sciences Replication Project.

**Keywords:** Bayes factor, consistency, prior-data conflict, replication studies.

**References:**

Pawel, S., & Held, L. (2022). The sceptical Bayes factor for the assessment of replication success. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 84(3), 879-911.

Verhagen, J., & Wagenmakers, E. J. (2014). Bayesian tests to quantify the result of a replication attempt. *Journal of Experimental Psychology: General*, 143(4), 1457.

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