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This methodological work does not contain (new) empirical data. The simulations are set up to be consistent with typical sample sizes and trial numbers of empirical studies in cognitive neuroscience (e.g., an fMRI study with 30 participants and 160 trials). This is explained in the Materials and methods.

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This methodological work does not contain replications of previous experiments. However, one analysis published in a previous study (Gluth et al., 2015, Neuron) is reproduced with the newly proposed method of this work (see Results Section XI).

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Justification for statistical tests on the simulations can be found in the Materials and methods. Similarly, statistical tests of the example fMRI study are explained in the Materials and methods. Exact p-values are reported together with effect sizes. In addition, Bayes Factors (of the Bayesian equivalents of frequentist statistical tests) are reported. Error bars in all figures represent 95% confidence intervals.

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