

### Finding and Interpreting Bayes Factors From Published Summary Statistics

$$BF_{10} = P(\text{data} | H_1) \div P(\text{data} | H_0)$$

Values greater than 1 constitute evidence in favor of  $H_1$  relative to  $H_0$

Values between 1 and 3 are typically considered to be only weak evidence in favor of the alternative hypothesis ( $H_1$ ) relative to the null hypothesis ( $H_0$ ).

Values above 10 are typically considered to be fairly strong evidence in favor of the alternative hypothesis ( $H_1$ ) relative to the null hypothesis ( $H_0$ ).

As with p-values, Bayes factors should not be interpreted without considering other factors such as the results of prior research, the theoretical rationale for the idea being tested, and the quality of the research design.

In the examples below, assume the idea being tested is at least fairly plausible, and that the study was properly conducted.

Use the summary stats module in JASP to find the  $BF_{10}$  and answer the questions below.

1. A recent research article reported a “statistically significant positive correlation between mood and memory performance,  $r = .29$ ,  $p = .04$ .” The sample size was 50.
  - a. What is the  $BF_{10}$  for this correlation? In JASP: Summary Statistics > Bayesian Correlation.
  - b. Does this correlation provide strong evidence that there is a correlation between mood and memory performance? Briefly explain your answer.
  
2. A recent research article reported a “statistically significant improvement for clients who received the new treatment, relative to the standard treatment,  $t = 2.20$ ,  $p = .03$ .” The sample size in each group was 40.
  - a. What is the  $BF_{10}$  for this t-test? In JASP: Summary Statistics > Bayesian Independent Samples T-Test.
  - b. Does this result provide strong evidence in favor of the new treatment? Briefly explain your answer.
  
3. A recent research article reported a “statistically significant improvement for children taught by the new method, relative to the standard method,  $t = 3.20$ ,  $p < .001$ .” The sample size in each group was 30.
  - a. What is the  $BF_{10}$  for this t-test? In JASP: Summary Statistics > Bayesian Independent Samples T-Test.
  - b. Does this result provide strong evidence in favor of the new method? Briefly explain your answer.