# Results

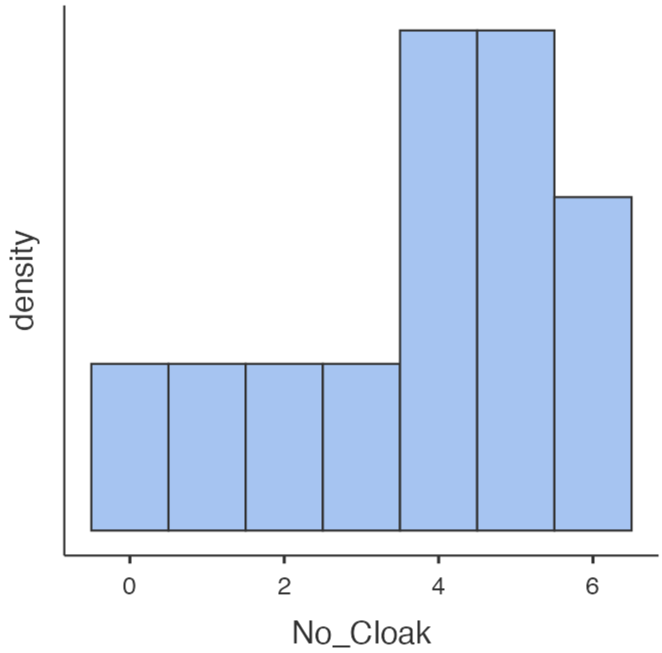
# Descriptives

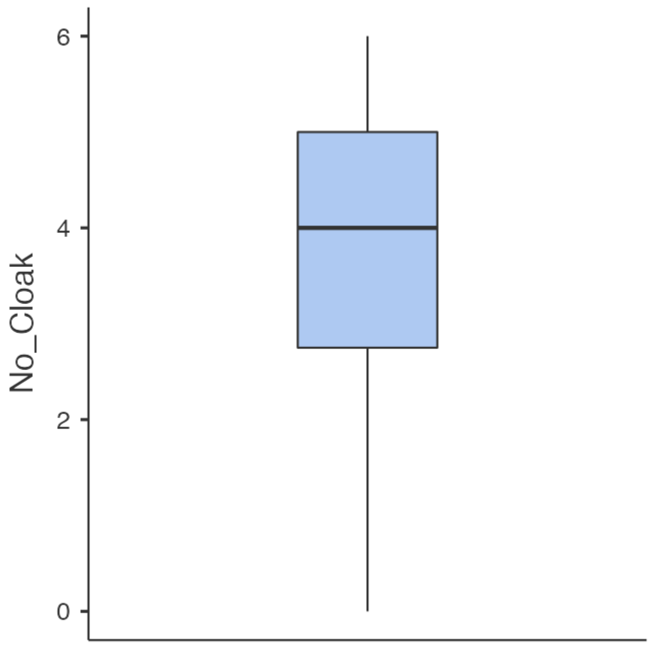
Descriptives

| | No_Cloak | Cloak |
|---|---|---|
| N | 12 | 12 |
| Missing | 0 | 0 |
| Mean | 3.75 | 5.00 |
| Median | 4.00 | 5.00 |
| Standard deviation | 1.91 | 1.65 |
| Minimum | 0.00 | 2.00 |
| Maximum | 6.00 | 8.00 |
| Skewness | -0.789 | 0.00 |
| Std. error skewness | 0.637 | 0.637 |
| Kurtosis | -0.229 | 0.161 |
| Std. error kurtosis | 1.23 | 1.23 |
| Shapiro-Wilk W | 0.913 | 0.973 |
| Shapiro-Wilk p | 0.231 | 0.936 |

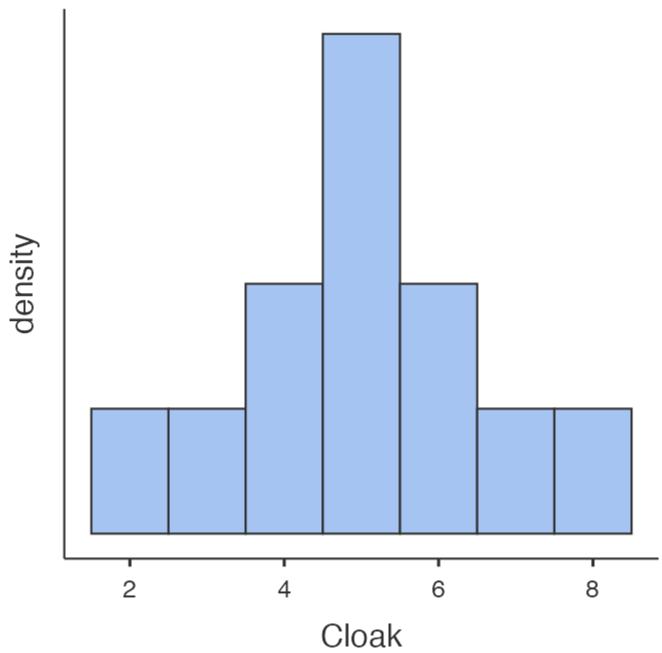
## Plots

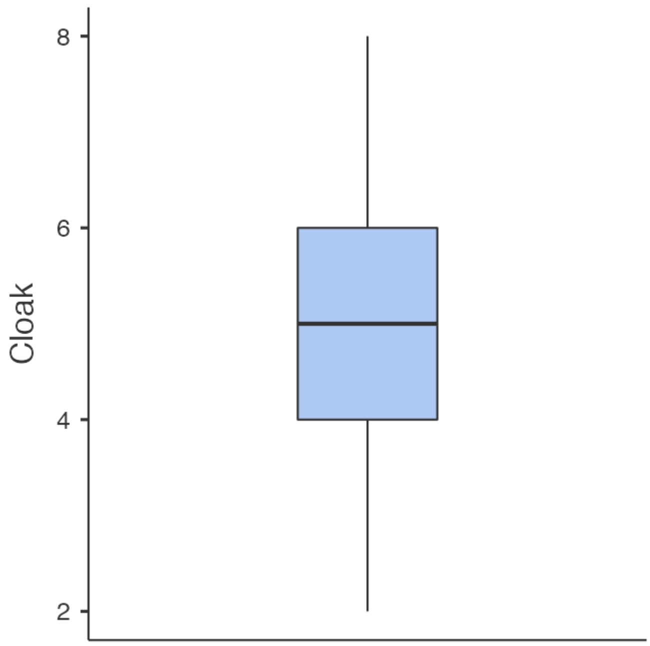
**No_Cloak**






**Cloak**






## Relationships, Prediction, and Group Comparisons

Welcome to Statkat! This tool will help you to find an appropriate statistical method given the measurement level of your data. Make sure you have correctly defined the measurement levels of your variables on the Data tab. You can change the measurement level of a variable via the Setup button on the Data tab, or by double clicking on a column header of interest. You have selected the Relationships, Prediction, and Group Comparisons option. This is the place to be if you are interested in

- the relationship between two or more variables, or
- predicting one variable from other variables, or
- the difference between independent (unrelated) groups on a certain variable.

To get started, drop a variable in the box below Variable 1 / Dependent Variable, and one or more variables in the box below Variable 2 / Independent Variables. Our tool will then come up with a statistical method that may be appropriate for your data! In addition, you can drop one or more variables in the box below Control Variables. Control variables are variables that you are not particularly interested in, but which may be related to the dependent variable and possibly also to the independent variables. In experiments (with random assignment), control variables are often included to increase power. In observational studies, control variables are often included mainly to equate subjects on the control variables. This prevents the control variables from confounding the relationships between the independent variables and the dependent variable. If your research question does not make a clear distinction between an independent variable and a dependent variable, the decision of which variable to define as Variable 1/Dependent Variable and which as Variable 2/Independent Variables can be arbitrary. But doesn't this decision affect the recommended method? Well, in some cases it does affect the primary method recommendation, but if a simpler method can be performed by flipping the two variables, this is usually mentioned. It is then up to you which of the recommended methods you prefer. It is important to keep in mind here that none of the correlational statistical techniques can say anything about causality anyway (not even a method like regression analysis), so even if you do make a distinction between an independent and dependent variable, the statistical method will only say something about association, not causation. Note: Our advice is based on the measurement level of your data and on the number of variables entered. There can be details related to your data, task, or assignment that may render the advice moot. Always check the assumptions made by the statistical method before interpreting the results. We always try to come up with the least complicated method that might be applicable given your data. Keep in mind that there may be other, more advanced, methods that might be applicable as well.

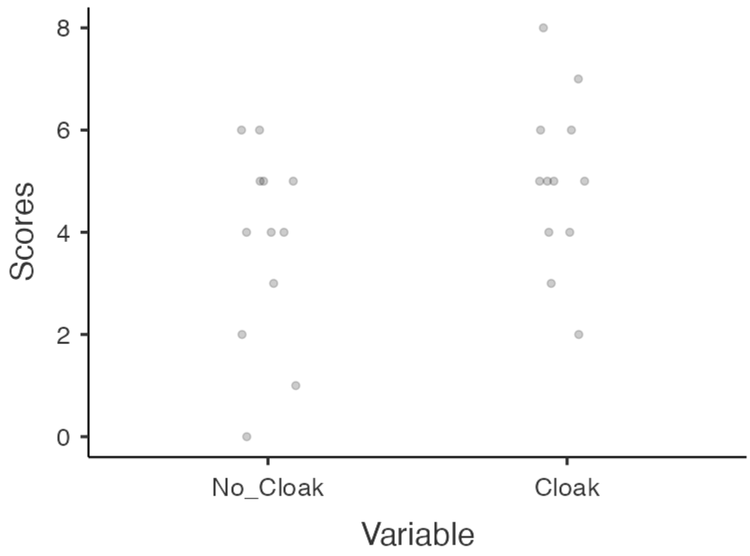
## Repeated Measurements

You have entered two related numeric variables. Hence, the paired sample t test seems to be a good option for you! In order to run this test in jamovi, go to: T-Tests > Paired Samples T-Test

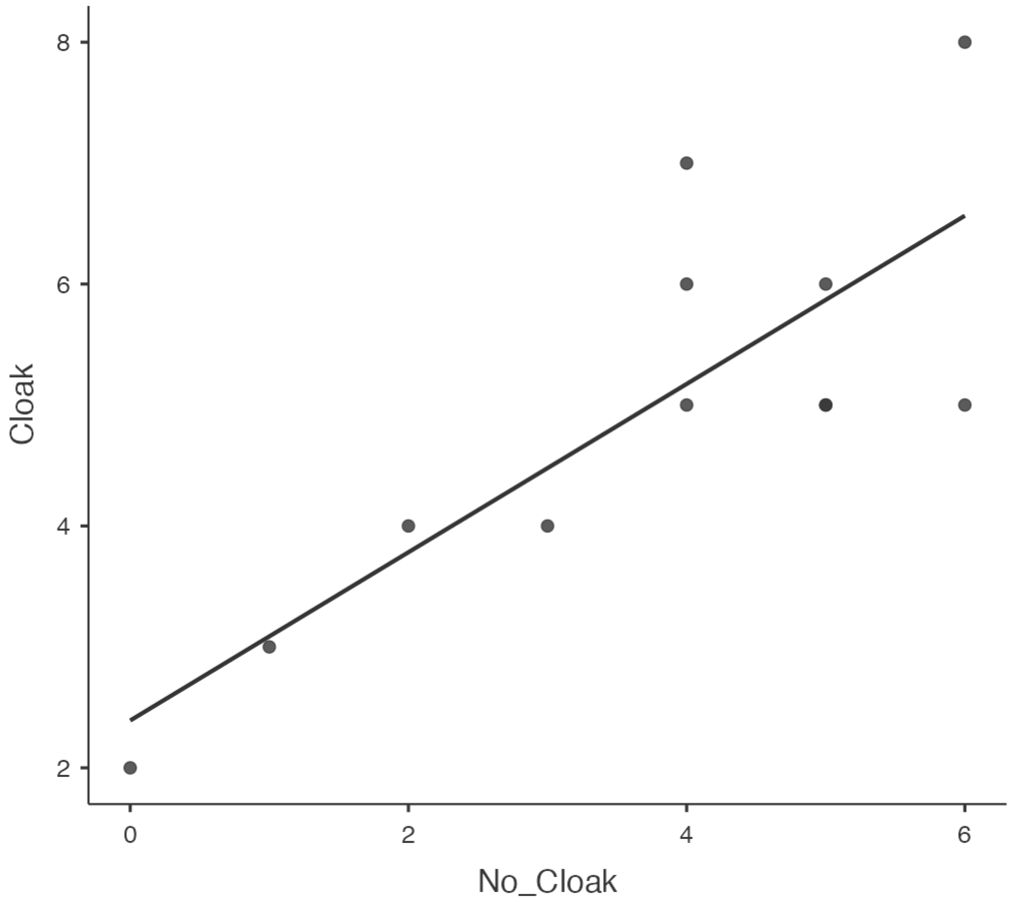
- Drop the two paired variables in the box below Paired Variables, one on the left side of the vertical line and one on the right side of the vertical line
- Under Hypothesis, select your alternative hypothesis

If the normality assumption is violated, you could use the non-parametric Wilcoxon signed rank test. Click on the links to learn more about these tests!

### Scatter Plot




## Scatterplot



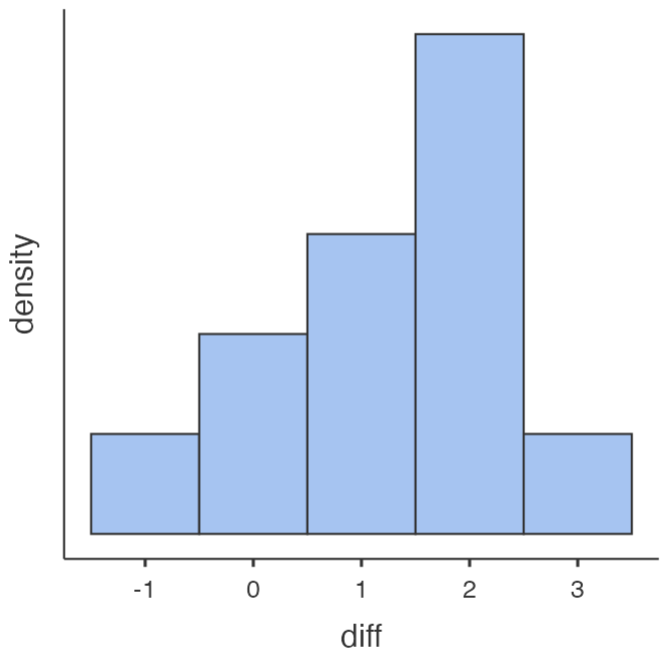

## Descriptives

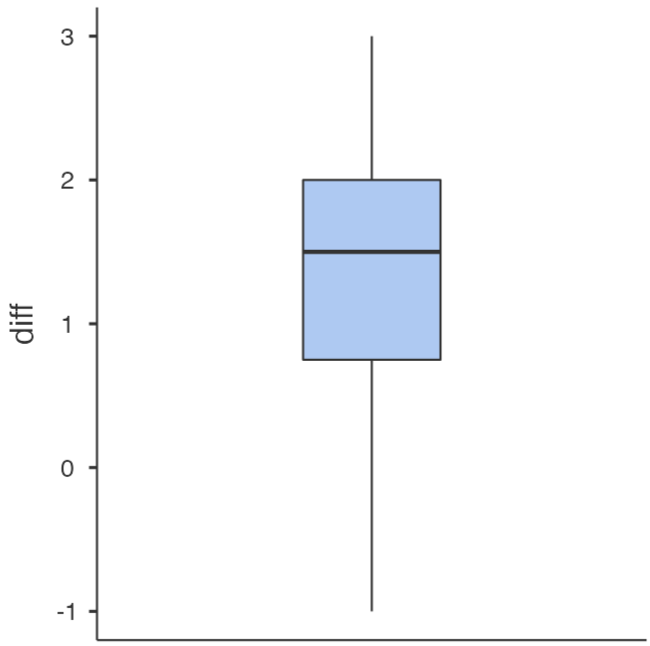
Descriptives

| | diff |
|---|---|
| N | 12 |
| Missing | 0 |
| Mean | 1.25 |
| Median | 1.50 |
| Standard deviation | 1.14 |
| Minimum | -1.00 |
| Maximum | 3.00 |
| Skewness | -0.583 |
| Std. error skewness | 0.637 |
| Kurtosis | -0.138 |
| Std. error kurtosis | 1.23 |
| Shapiro-Wilk W | 0.912 |
| Shapiro-Wilk p | 0.228 |

## Plots

**diff**






## Paired Samples T-Test

Paired Samples T-Test

| | | | statistic | df | p | Mean difference | SE difference | | Effect Size |
|---|---|---|---|---|---|---|---|---|---|
| No_Cloak | Cloak | Student's t | -3.80 | 11.0 | 0.003 | -1.25 | 0.329 | Cohen's d | -1.10 |

*Note.* $H_a$ $\mu_{\text{Measure 1 - Measure 2}} \neq 0$

Normality Test (Shapiro-Wilk)

| | | | W | p |
|---|---|---|---|---|
| No_Cloak | - | Cloak | 0.912 | 0.228 |

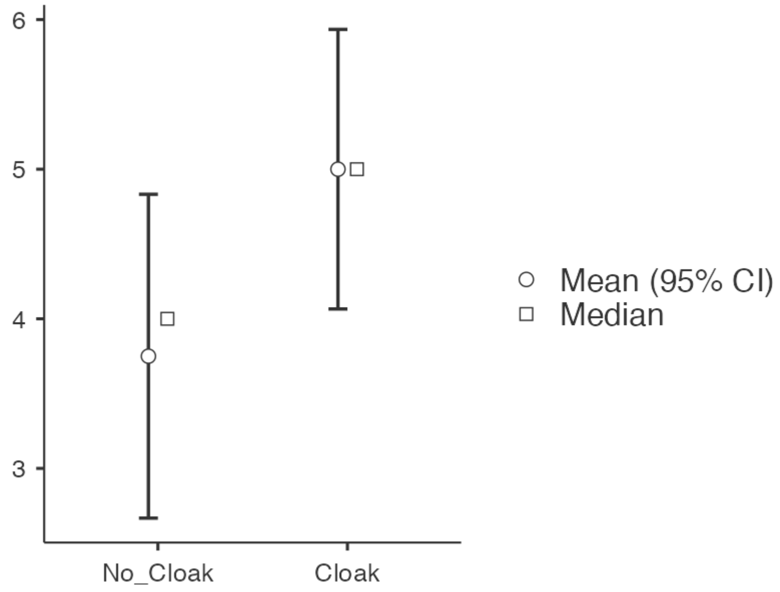
*Note.* A low p-value suggests a violation of the assumption of normality

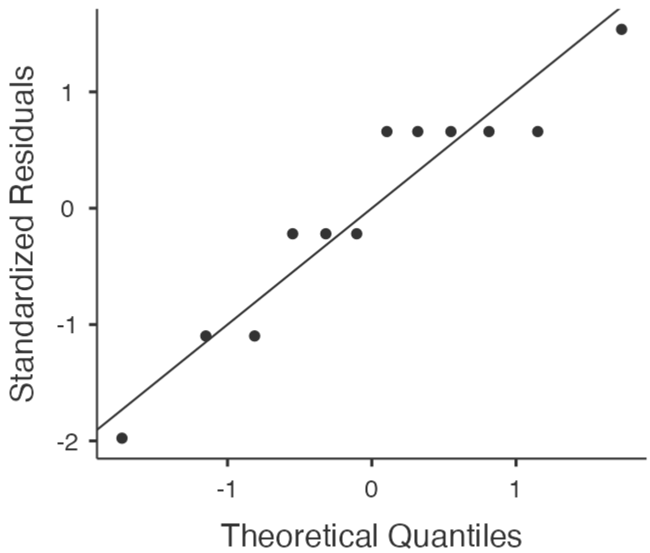
Descriptives

| | N | Mean | Median | SD | SE |
|---|---|---|---|---|---|
| No_Cloak | 12 | 3.75 | 4.00 | 1.91 | 0.552 |
| Cloak | 12 | 5.00 | 5.00 | 1.65 | 0.477 |

### Plots

**No_Cloak - Cloak**




## Robust Paired Samples T-Test

Robust Paired Samples T-Test

| | | t | df | p | Mean difference | SE | 95% Confidence Interval Lower | 95% Confidence Interval Upper | Cohen's d |
|---|---|---|---|---|---|---|---|---|---|
| Cloak | No_Cloak | 2.70 | 7.00 | 0.031 | 1.00 | 0.370 | 0.125 | 1.87 | 0.398 |

## Bayesian Paired Samples T-Test

Bayesian Paired Samples T-Test

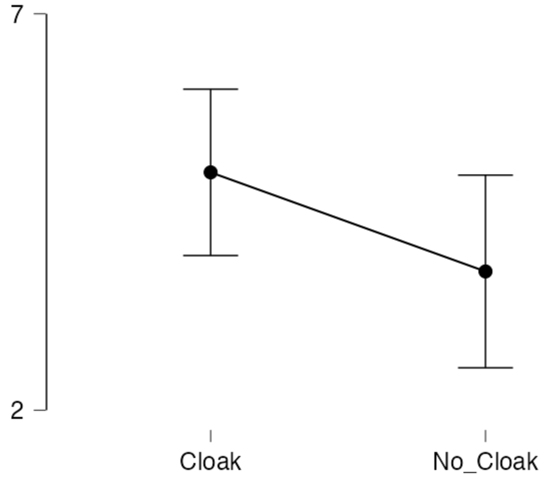
| | | | $BF_{10}$ | error % |
|---|---|---|---|---|
| No_Cloak | - | Cloak | 16.3 | 4.03e-6 |

**[3] [4] [5]**

## Descriptives

**Descriptives Plot**

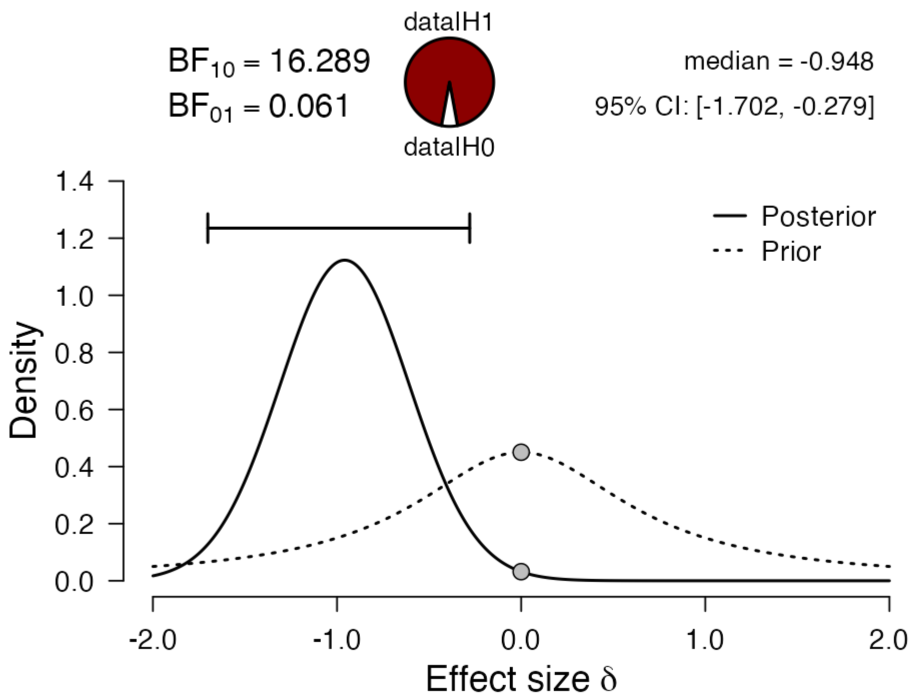
**No_Cloak - Cloak**



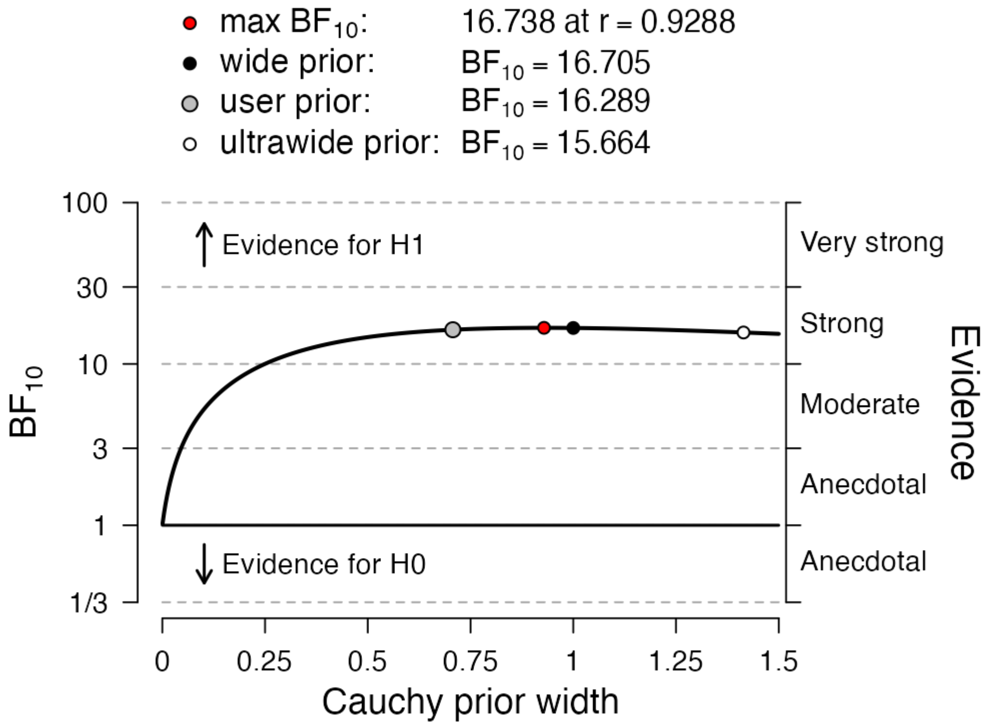

## Inferential Plots

**No_Cloak - Cloak**

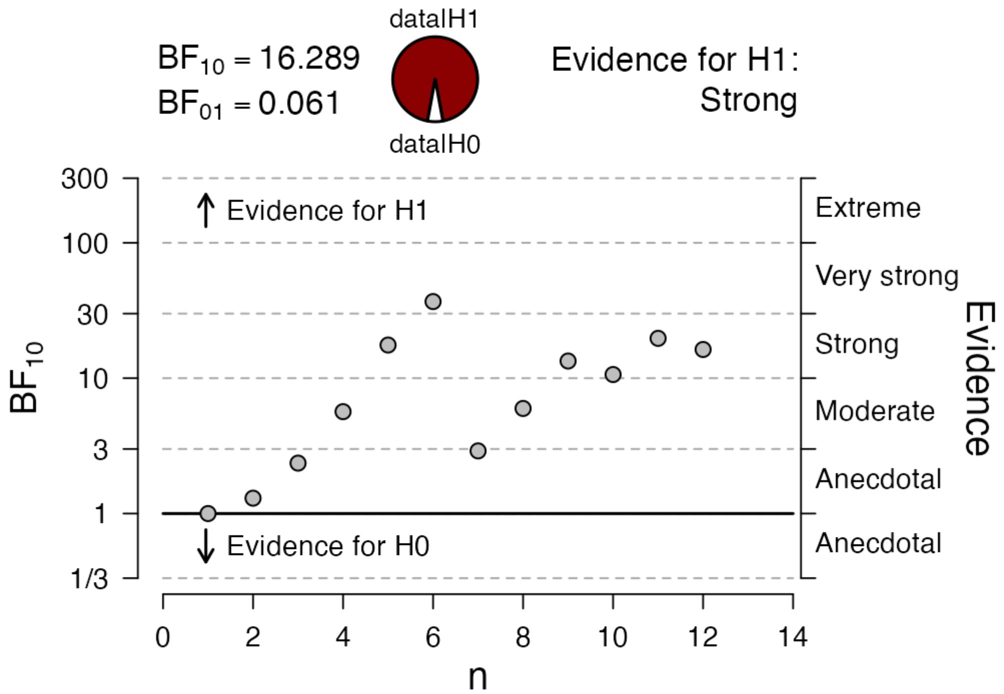
**Prior and Posterior**




**Bayes Factor Robustness Check**




**Sequential Analysis**




# References

**[1]** The jamovi project (2022). *jamovi*. (Version 2.3) [Computer Software]. Retrieved from https://www.jamovi.org.

**[2]** R Core Team (2021). *R: A Language and environment for statistical computing*. (Version 4.1) [Computer software]. Retrieved from https://cran.r-project.org. (R packages retrieved from MRAN snapshot 2022-01-01).

**[3]** JASP Team (2018). *JASP*. [Computer software]. Retrieved from https://jasp-stats.org.

**[4]** Morey, R. D., & Rouder, J. N. (2018). *BayesFactor: Computation of Bayes Factors for Common Designs*. [R package]. Retrieved from https://cran.r-project.org/package=BayesFactor.

**[5]** Rouder, J. N., Speckman, P. L., Sun, D., Morey, R. D., & Iverson, G. (2009). Bayesian t tests for accepting and rejecting the null hypothesis. *Psychonomic Bulletin & Review, 16*, 225-237.