Poweranalyse

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Defining the population effect

As a first step we define the population according to the findings from Study 1.

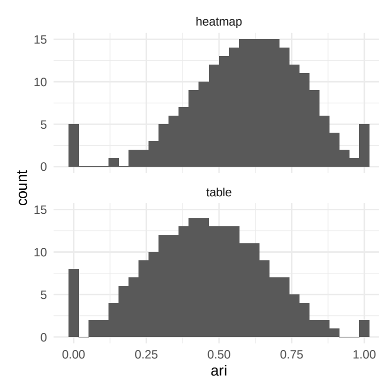
```
library(bayestestR)
library(tidyverse)
library(hrbrthemes)

# setting seed for reproducibility
set.seed(9174)

data_heatmap <-
  c(distribution_beta(203, 4.5, 3),
    rep(0, 5), rep(1,5))

data_table <-
  c(distribution_beta(203, 3, 3.5),
    rep(0, 8), rep(1,2))

data <-
  tibble(
    ari = c(data_heatmap,
            data_table),
    group = c(
      rep("heatmap", 213),
      rep("table", 213)
    ))
```



The effect size for this data is as follows:

```
effsize::VD.A(data_table, data_heatmap)
```

```
##
## Vargha and Delaney A
##
## A estimate: 0.2954881 (medium)
```

Sampling & Estimation

```
# Initialize a vector of results
CI_with_zero <- logical()

# setting seed for reproducibility
set.seed(8742)

length_sim <- 1

for (i in 1:length_sim){
# Sampling
data_sampled <-
  data %>%
  group_by(group) %>%
  sample_n(100)

# Fitting the model
library(brms)
fit <- brm(
  formula = bf(
    ari ~ 1 + group),
  data = data_sampled,
  silent = 0,
  family = zero_one_inflated_beta())

fit_summary <-
  summary(fit)

# Storing the result
CI_with_zero[i] <-
  sign(fit_summary$fixed$`l-95% CI`[2]) !=
  sign(fit_summary$fixed$`u-95% CI`[2])
}
```

```
## Lade nötiges Paket: Rcpp

## Loading 'brms' package (version 2.17.0). Useful instructions
## can be found by typing help('brms'). A more detailed introduction
## to the package is available through vignette('brms_overview').

##
## Attache Paket: 'brms'

## Das folgende Objekt ist maskiert 'package:stats':
```

```
##
##     ar

## Compiling Stan program...

## Trying to compile a simple C file

## Start sampling
```

Power of the Model

Despite the fact that "power" is a somewhat awkward entity within a Bayesian framework, we use it here to describe the proportion of simulated data sets which to not contain the zero in its highest density interval. This proportion equals:

```
1 - sum(CI_with_zero)/length_sim |>
  round(2)
```

```
## [1] 1
```