

Mean Attitude Ratings

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Introduction

This file is to reproduce the means and 95% highest density intervals for the ratings for the questions on participants' "willingness to continue" and "relationship" reported in the "Results"-section of the paper.

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Setup

First, we load the rethinking package, which we need to fit and sample from models. We also load the ggplot2 package for creating plots and formatR for formatting.

```
library(formatR) # For formatting
library(ggplot2) # For plots
library(rethinking) # For Bayesian models
```

Also, we set the number of iterations and number of chains used for fitting the models.

```
# For fitting models
NUM_ITERATIONS = 2000 # our value: 2000
NUM_CHAINS = 4 # our value: 4
```

Data file

We load the pre-processed data.

```
df = read.csv(file = "preprocessed_data.csv")
```

Highest density interval per question

Now we compute the mean and 95% highest density interval for the two attitude questions.

```
resp_types = c(c("A3R_1"), c("A4R_1"))

creds_low = numeric(length(resp_types))
creds_high = numeric(length(resp_types))
means = numeric(length(resp_types))
nums = numeric(length(resp_types))

ratings = list(df$A3R_1, df$A4R_1)

for (i in 1:2) {

  rating_curr = ratings[[i]]

  # Create a data list to be used for the
  # model
  dat_list <- list(rating = rating_curr)

  set.seed(18) # For reproducibility

  # Fit model
  ml <- ulam(alist(rating ~ normal(mu, sigma),
    mu <- a_bar, a_bar ~ dnorm(0, 10), sigma ~
    dexp(1)), data = dat_list, chains = NUM_CHAINS,
    log_lik = TRUE, cores = NUM_CHAINS, iter = NUM_ITERATIONS)

  res = precis(ml, prob = 0.95)

  means[i] = res[1, 1]
  nums[i] = length(df)

  # Sample from posterior
  set.seed(18) # For reproducibility
  samples <- extract.samples(ml, n = 10000)

  # Compute 95% HDI
  hdpi <- HPDI(samples$a_bar, prob = 0.95)
  creds_low[i] = hdpi[1]
  creds_high[i] = hdpi[2]

  rm(ml)
}
```

Now we print the results for both questions.

```
print("Willingness to continue:")

## [1] "Willingness to continue:"

paste("Mean:", round(means[1], 2), ", HDI = [", round(creds_low[1],
  2), ", ", round(creds_high[1], 2), ""])
```

```
## [1] "Mean: 2.42 , HDI = [ 2.18 , 2.65 ]"
print("Relationship:")

## [1] "Relationship:"
paste("Mean:", round(means[2], 2), ", HDI = [", round(creds_low[2],
  2), ",", round(creds_high[2], 2), "]")

## [1] "Mean: 0.46 , HDI = [ 0.24 , 0.67 ]"
```

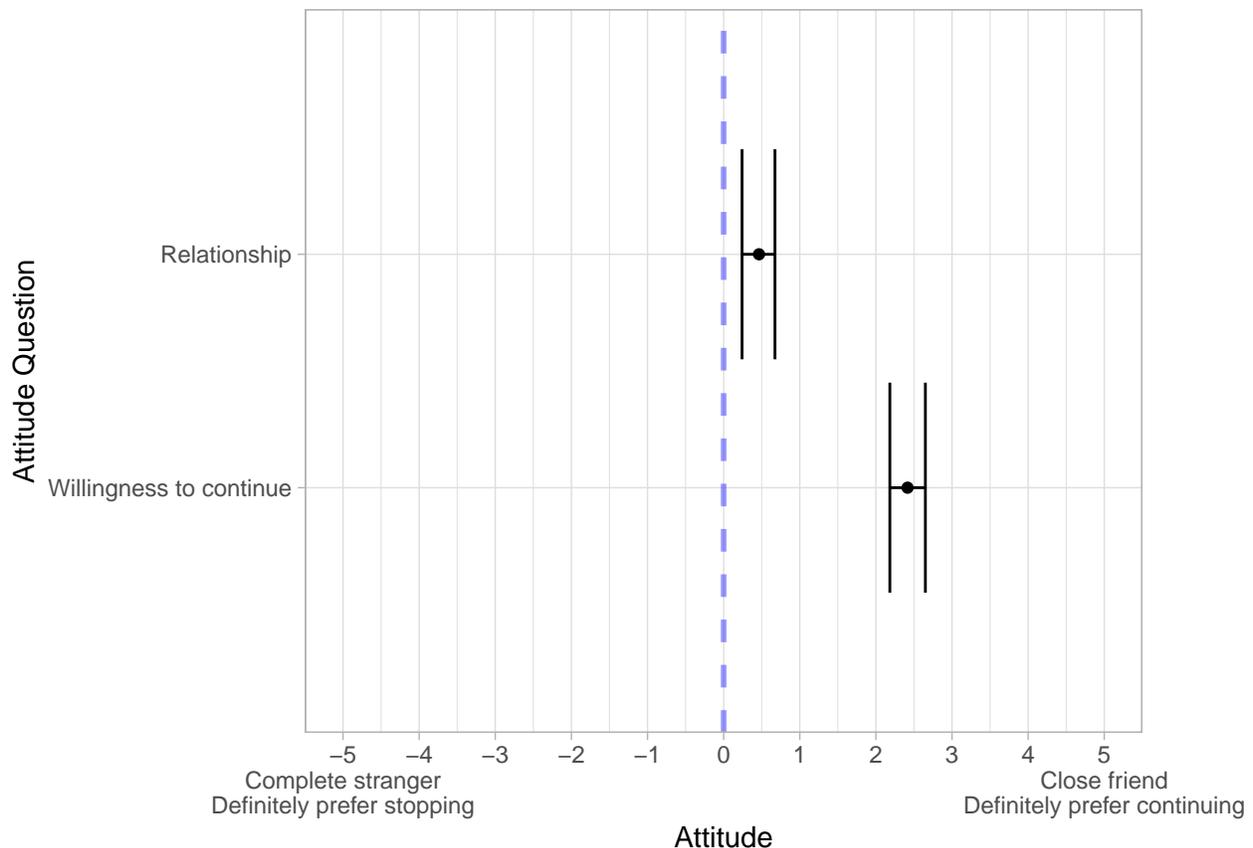
Create plot

And we plot the mean and 95% highest density interval of the ratings per attitude question in a single figure.

```
data = data.frame(means, nums, creds_low, creds_high) # create data frame
data$row_num <- seq.int(nrow(data)) # add row number

ggplot(data, aes(means, row_num)) + # ggplot2 plot with confidence intervals
  geom_point() +
  geom_errorbar(aes(xmin = creds_low, xmax = creds_high)) +
  theme_light() +
  ylab("Attitude Question") +
  scale_y_discrete(limits = c(1, 2), labels = c("Willingness to continue", "Relationship")) + geom_vline(
  theme(plot.margin = margin(t = 0.1, r = 1.4, b = 0.1, l = 0.1, "cm"))
```

```
## Warning: Continuous limits supplied to discrete scale.
## Did you mean 'limits = factor(...)' or 'scale*_continuous()'?
```



```
# Save image  
pdf_file <- "Figures/attitude_question_ratings_hdis.pdf"  
ggsave(pdf_file, dpi=1500)
```

```
## Saving 6.5 x 4.5 in image
```