Thirst and Alertness: R Markdown Document

Carson Keeter

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Rmcorr Background (repeated measures correlation)

Rmcorr estimates the common regression slope, the association shared among individuals, and does not violate the assumption of independence of observations. With this we can assure that the changes in thirst are associated with changes in alertness (R2 = .29, p <.001)

For more details on using rmcorr see https://cran.r-project.org/web/packages/rmcorr/rmcorr.pdf (https://cran.r-project.org/web/packages/rmcorr/rmcorr.pdf).

Summary of Dataset

Our dataset is summarized below:

```
##      SubNum          Group              Visits           ThirstChange
##  Min.   :  1.00   Length:230         Length:230         Min.   :-126.667
##  1st Qu.: 35.25   Class :character   Class :character   1st Qu.: -19.750
##  Median : 78.00   Mode  :character   Mode  :character   Median :   9.000
##  Mean   : 75.55                                         Mean   :   8.223
##  3rd Qu.:112.75                                         3rd Qu.:  36.000
##  Max.   :144.00                                         Max.   : 133.000
##   AlertChange
##  Min.   :-95.000
##  1st Qu.:-24.750
##  Median : -4.000
##  Mean   : -6.136
##  3rd Qu.: 13.000
##  Max.   :100.000
```

R Packages Used in Analysis

```
library(rmcorr)
library(ggplot2)
library(tidyverse)
```

```
## -- Attaching packages ---------------------------------------------------------------------
--------- tidyverse 1.2.1 --
```

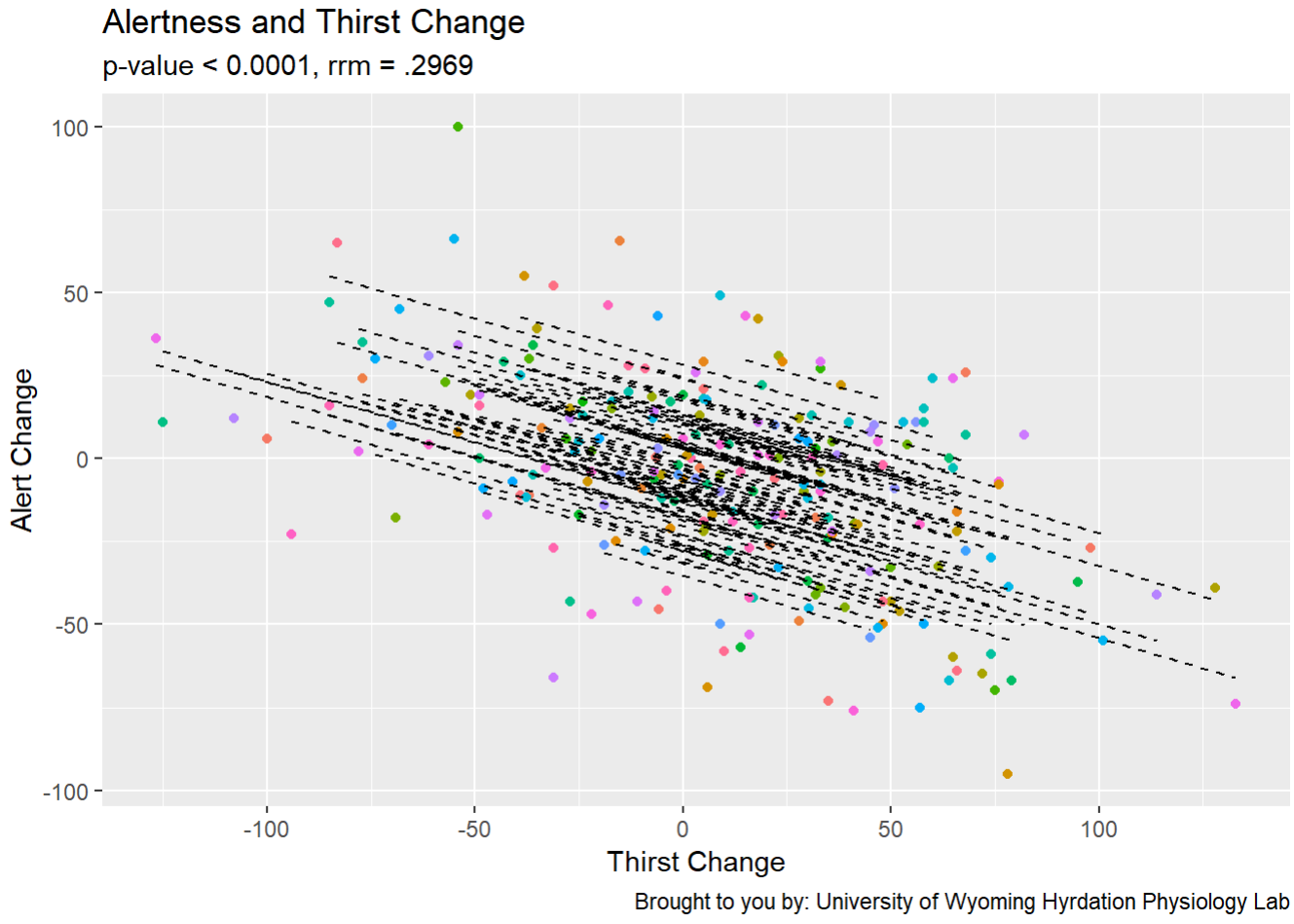
```
## v tibble  1.4.2     v purrr   0.2.5
## v tidyr   0.8.1     v dplyr   0.7.6
## v readr   1.1.1     v stringr 1.3.1
## v tibble  1.4.2     v forcats 0.3.0
```

```
## -- Conflicts ------------------------------------------------------------------------------
--- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(tidyr)
```

Plotting with rmcorr

Below is the visualization for the Thirst Change and Alertness Data using repeated measures:



(Note that the colors are paired and graded. Depending on display settings, colors may appear in more or less detail.)

Detailed Code

Below is a detail summary of the code used in this analysis (for reference in future studies)

```
# Sub_Num <- tibble(df$SubNum)
# Thirst_Change <- tibble(df$ThirstChange)
# Alert_Change <- tibble(df$AlertChange)
# library(rmcorr)
# rmcorr(Sub_Num, Thirst_Change, Alert_Change, df)
# ggplot(df, aes(x = TC, y = AC, group = factor(Num)), color = factor(Num)) +
#     geom_point(aes(color = factor(Num)), show.legend = FALSE) +
#     geom_line(aes(y = my_rmc$model$fitted.values), linetype = 2) +
#     labs(x = "Thirst Change", y = "Alert Change", title = "Alertness and Thirst Change", subti
tle =
#     "p-value < 0.0001,
#     rrm = .2969", caption = "Brought to you by: University of Wyoming Hyrdation Physiology La
b")
```

Contact: Carson Keeter (keeterc1@gmail.com (mailto:keeterc1@gmail.com)) for any questions regarding code or analysis.