Trial and Emotion Data Analysis

```
library(tidyverse)
```

```
## Warning: Installed Rcpp (0.12.12) different from Rcpp used to build dplyr (0.12.11).
## Please reinstall dplyr to avoid random crashes or undefined behavior.
```

```
## Loading tidyverse: ggplot2
## Loading tidyverse: tibble
## Loading tidyverse: tidyr
## Loading tidyverse: readr
## Loading tidyverse: purrr
## Loading tidyverse: dplyr
```

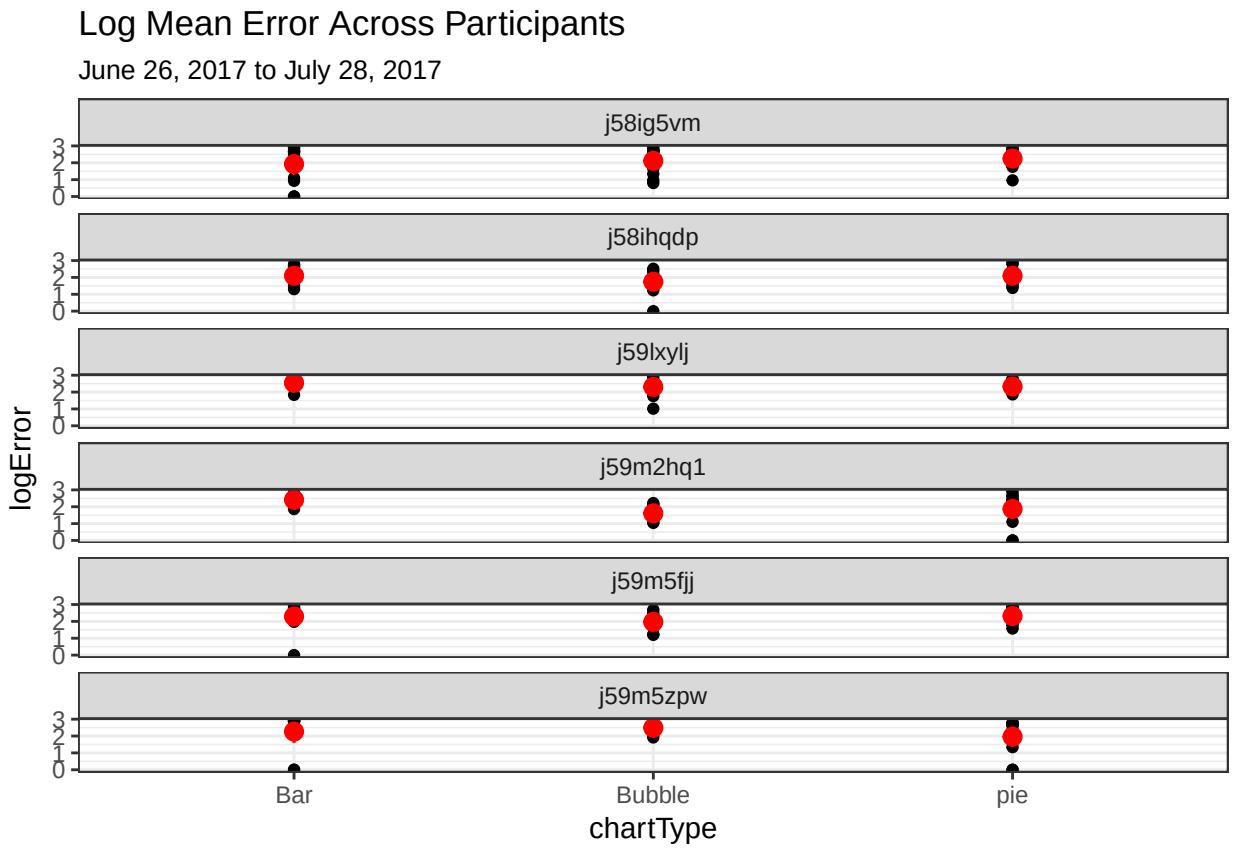
```
## Conflicts with tidy packages ----------------------------------------------
```

```
## filter(): dplyr, stats
## lag():    dplyr, stats
```

```
trial_data2 <- read_csv("data/trial_data2.csv")
```

```
## Parsed with column specification:
## cols(
##   key = col_character(),
##   name = col_character(),
##   num = col_integer(),
##   chartType = col_character(),
##   targetA = col_integer(),
##   targetB = col_integer(),
##   actualDiff = col_double(),
##   input = col_double(),
##   time = col_double(),
##   chartData_1 = col_integer(),
##   chartData_2 = col_integer(),
##   chartData_3 = col_integer(),
##   chartData_4 = col_integer(),
##   chartData_5 = col_integer(),
##   chartData_6 = col_integer(),
##   chartData_7 = col_integer(),
##   chartData_8 = col_integer(),
##   chartData_9 = col_integer(),
##   chartData_10 = col_integer()
## )
```

```
trial_data2 $ error <- trial_data2 $ actualDiff - trial_data2 $ input
trial_data2 $ absError = abs(trial_data2 $ error)
trial_data2 $ logError <- log2(abs(trial_data2 $ input - trial_data2 $ actualDiff) + 1/8)
trial_data2 $ logError <- abs(trial_data2 $ logError)
trial_data2 $ logError[trial_data2 $ logError == 3] <- 0
d <- ggplot(trial_data2, aes(chartType, logError)) + geom_point()
d + stat_summary(fun.data = "mean_cl_boot", colour = "red", size = .55) + facet_wrap(~key, ncol = 1) +
  labs(title ="Log Mean Error Across Participants", subtitle="June 26, 2017 to July 28, 2017") +
  theme_bw()
```

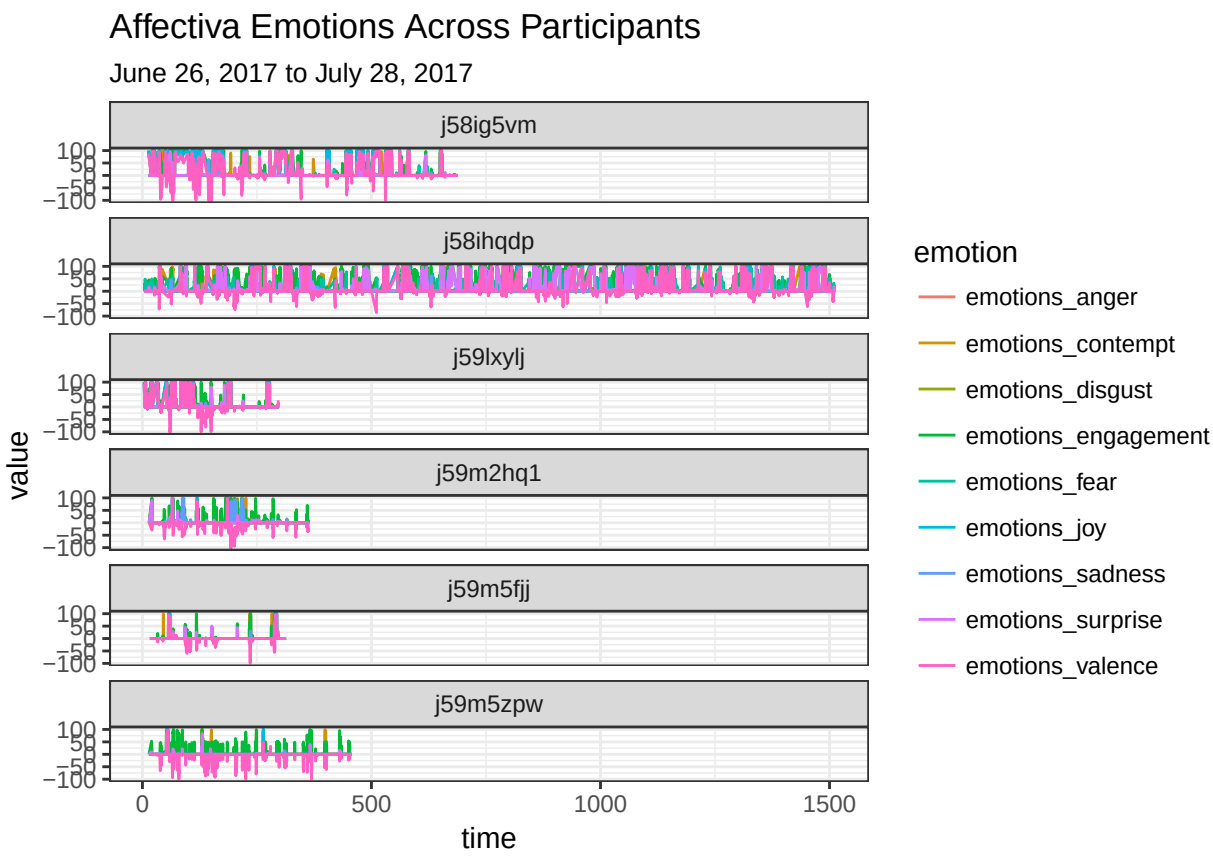



```
ggsave("img/trials.pdf", width = 4, height = 10, units = "in")
```

Emotion Charts Faceted by Participant

```
library(tidyverse)
library(devtools)
library(ggplot2)

emo <- read.csv('data/emotion_data2.csv', header=TRUE)
emo2 <- emo %>%
  gather(
    `emotions_joy`,
    `emotions_sadness`,
    `emotions_disgust`,
    `emotions_contempt`,
    `emotions_anger`,
    `emotions_fear`,
    `emotions_surprise`,
    `emotions_valence`,
    `emotions_engagement`,
    key = "emotion",
    value = "value") %>%
  select(emotion, value, time, key)
ggplot(emo2) +
  geom_line(aes(x=time, y=value, colour=emotion)) +
  facet_wrap(~ key, ncol=1) +
  labs(title ="Affectiva Emotions Across Participants", subtitle="June 26, 2017 to July 28, 2017") +
  theme_bw()
```



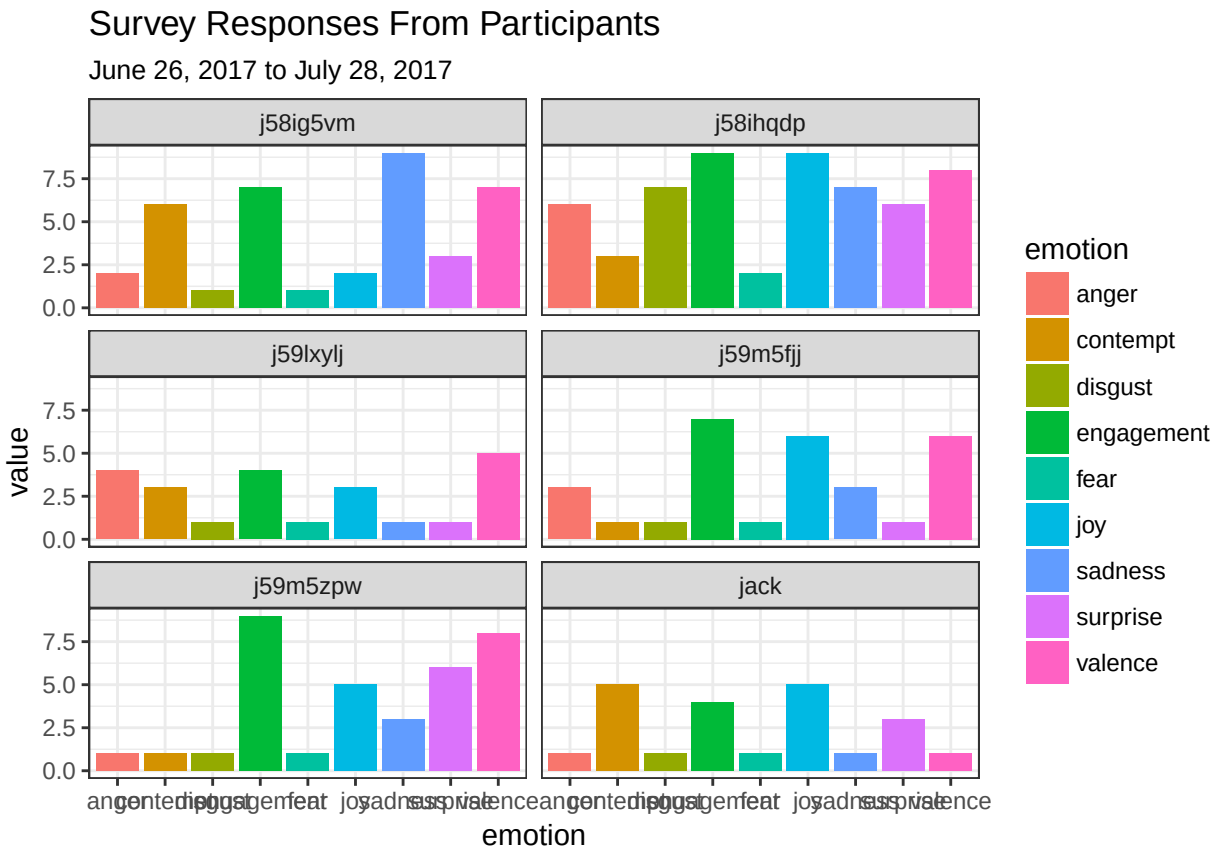

```
ggsave("img/emotions.pdf", width = 20, height = 10, units = "in")
```

Survey Data Charts

```
survey <- read.csv('data/survey_data.csv', header=TRUE)

survey2 <- survey %>%
  gather(
    `joy`,
    `sadness`,
    `disgust`,
    `contempt`,
    `anger`,
    `fear`,
    `surprise`,
    `valence`,
    `engagement`,
    key = "emotion",
    value = "value") %>%
  select(emotion, value, key)

ggplot(survey2, aes(x=emotion, y=value, fill=emotion)) + geom_bar(stat="identity") + facet_wrap(~ key,
  labs(title ="Survey Responses From Participants", subtitle="June 26, 2017 to July 28, 2017") +
  theme_bw()
```




```
ggsave("img/survey.pdf", width = 16, height = 10, units = "in")
```

Bar Chart for Emotions

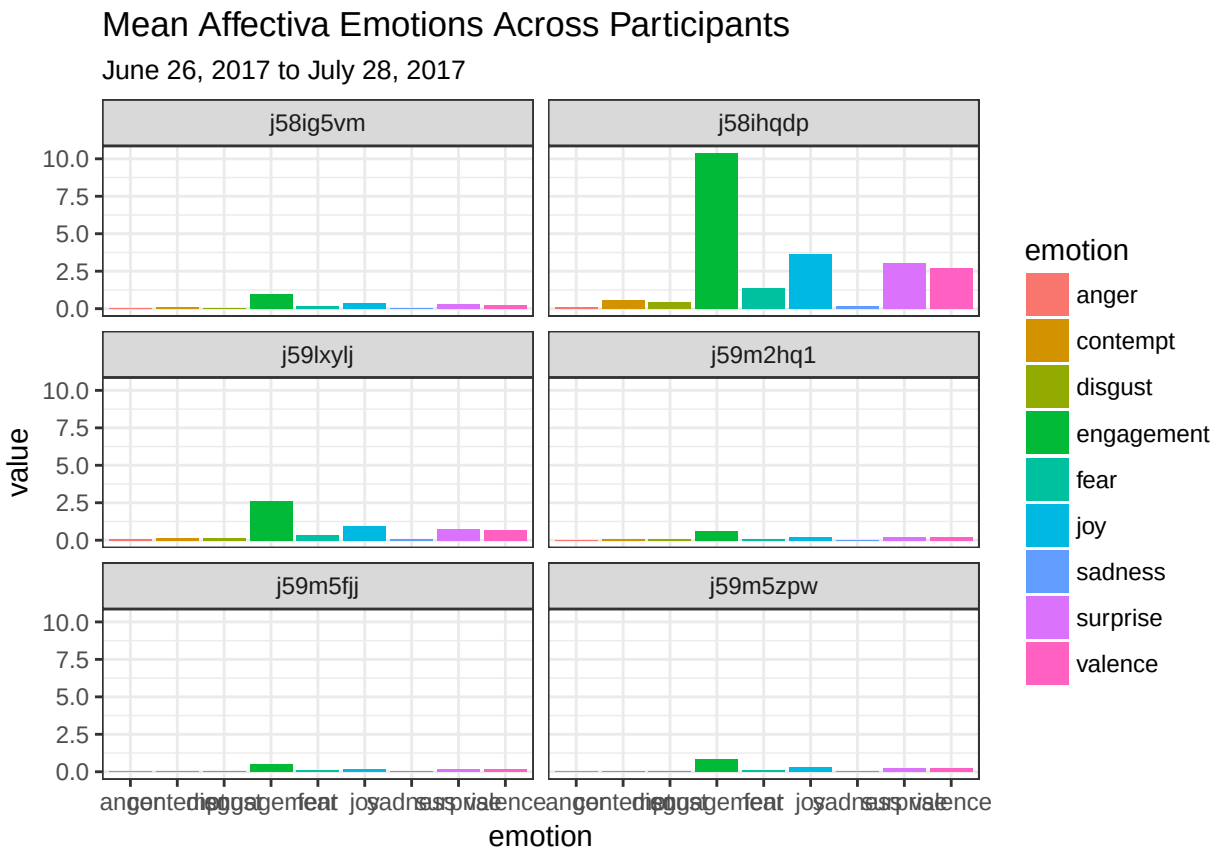
```
emo <- read.csv('data/emotion_data2.csv', header=TRUE)

emo$joy <- mean(emo$emotions_joy) / 100000 * 1.5
emo$sadness <- mean(emo$emotions_sadness)/100000* 1.5
emo$disgust <- mean(emo$emotions_disgust)/100000* 1.5
emo$contempt <- mean(emo$emotions_contempt)/100000* 1.5
emo$anger <- mean(emo$emotions_anger)/100000* 1.5
emo$fear <- mean(emo$emotions_fear)/100000* 1.5
emo$surprise <- mean(emo$emotions_surprise)/100000* 1.5
emo$valence <- mean(emo$emotions_valence)/ 100000* 1.5
emo$engagement <- mean(emo$emotions_engagement)/ 100000* 1.5

emo2 <- emo %>%
  gather(
    `joy`,
    `sadness`,
    `disgust`,
    `contempt`,
    `anger`,
    `fear`,
    `surprise`,
    `valence`,
    `engagement`,
    key = "emotion",
```

```
    value = "value") %>%
  select(emotion, value, time, key)

ggplot(emo2) +
geom_bar(aes(x=emotion, y=value, fill=emotion), stat = "identity") +
  facet_wrap(~ key, ncol=2) +
  labs(title ="Mean Affectiva Emotions Across Participants", subtitle="June 26, 2017 to July 28, 2017")
  theme_bw()
```



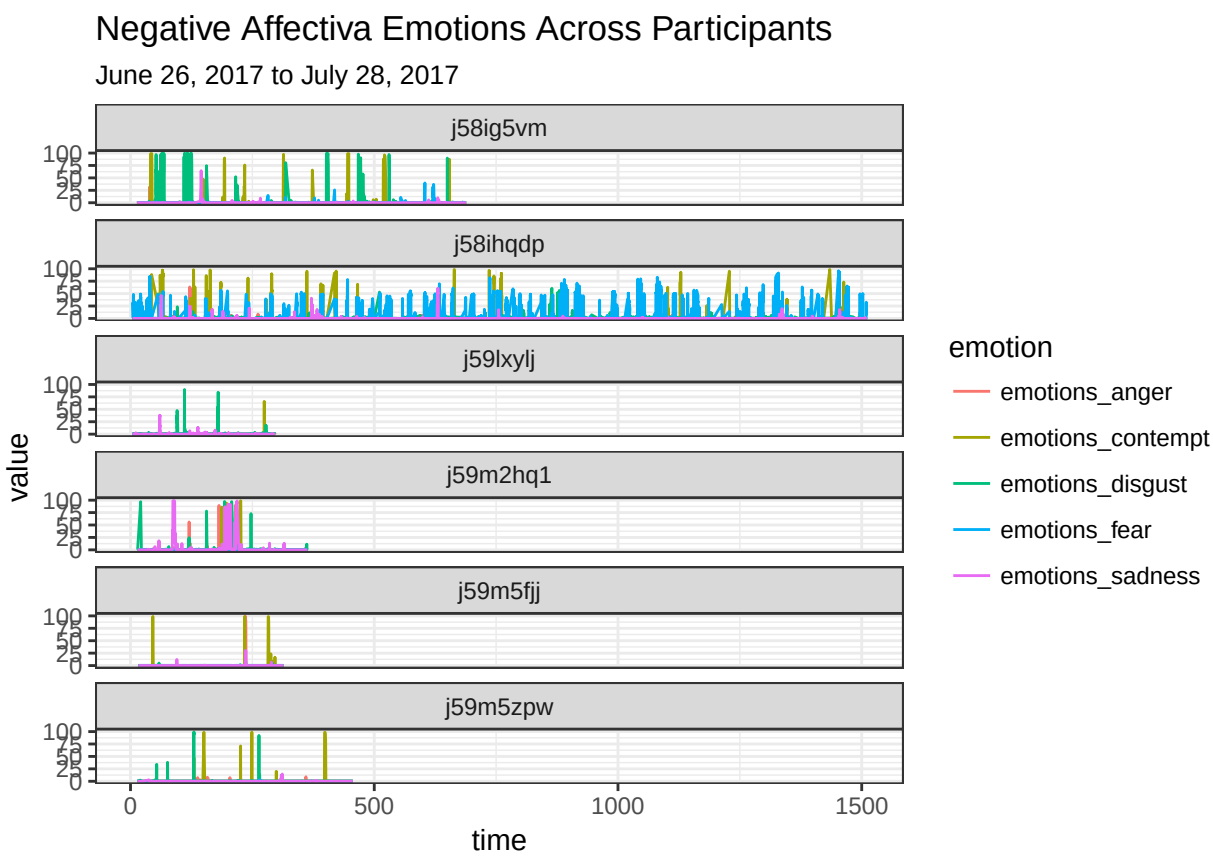

```
ggsave("img/barchart.pdf", width = 14, height = 20, units = "in")
```

Negative Emotions Graphed

```
library(tidyverse)
library(devtools)
library(ggplot2)

emo <- read.csv('data/emotion_data2.csv', header=TRUE)
emo2 <- emo %>%
  gather(
    `emotions_sadness`,
    `emotions_disgust`,
    `emotions_contempt`,
    `emotions_anger`,
    `emotions_fear`,
    key = "emotion",
    value = "value") %>%
```

```
  select(emotion, value, time, key)
ggplot(emo2) +
  geom_line(aes(x=time, y=value, colour=emotion)) +
  facet_wrap(~ key, ncol=1) +
  labs(title ="Negative Affectiva Emotions Across Participants", subtitle="June 26, 2017 to July 28, 20
  theme_bw()
```



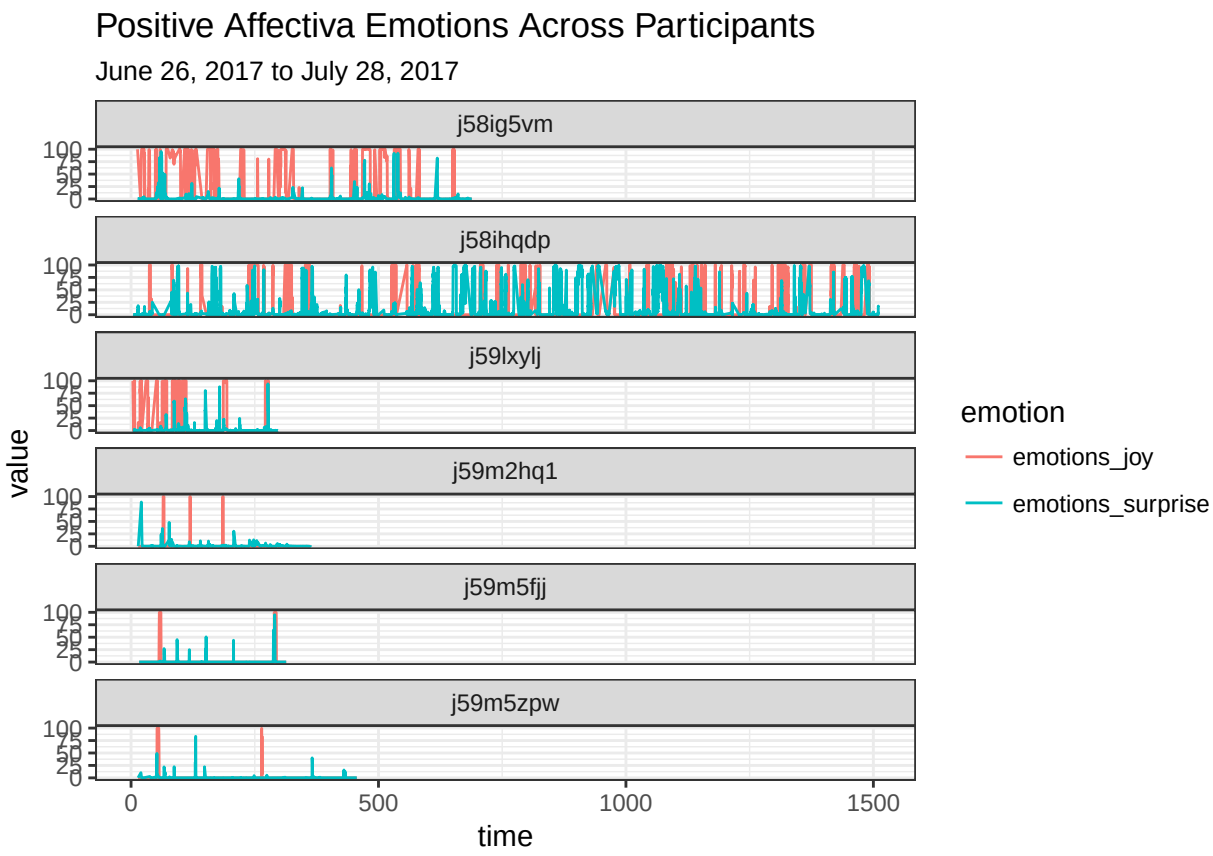

```
ggsave("img/emotionsneg.pdf", width = 20, height = 9, units = "in")
```

Positive Emotions Graphed

```
library(tidyverse)
library(devtools)
library(ggplot2)

emo <- read.csv('data/emotion_data2.csv', header=TRUE)
emo2 <- emo %>%
  gather(
    `emotions_joy`,
    `emotions_surprise`,
    key = "emotion",
    value = "value") %>%
  select(emotion, value, time, key)
ggplot(emo2) +
  geom_line(aes(x=time, y=value, colour=emotion)) +
  facet_wrap(~ key, ncol=1) +
  labs(title ="Positive Affectiva Emotions Across Participants", subtitle="June 26, 2017 to July 28, 20
```

```
  theme_bw()
```

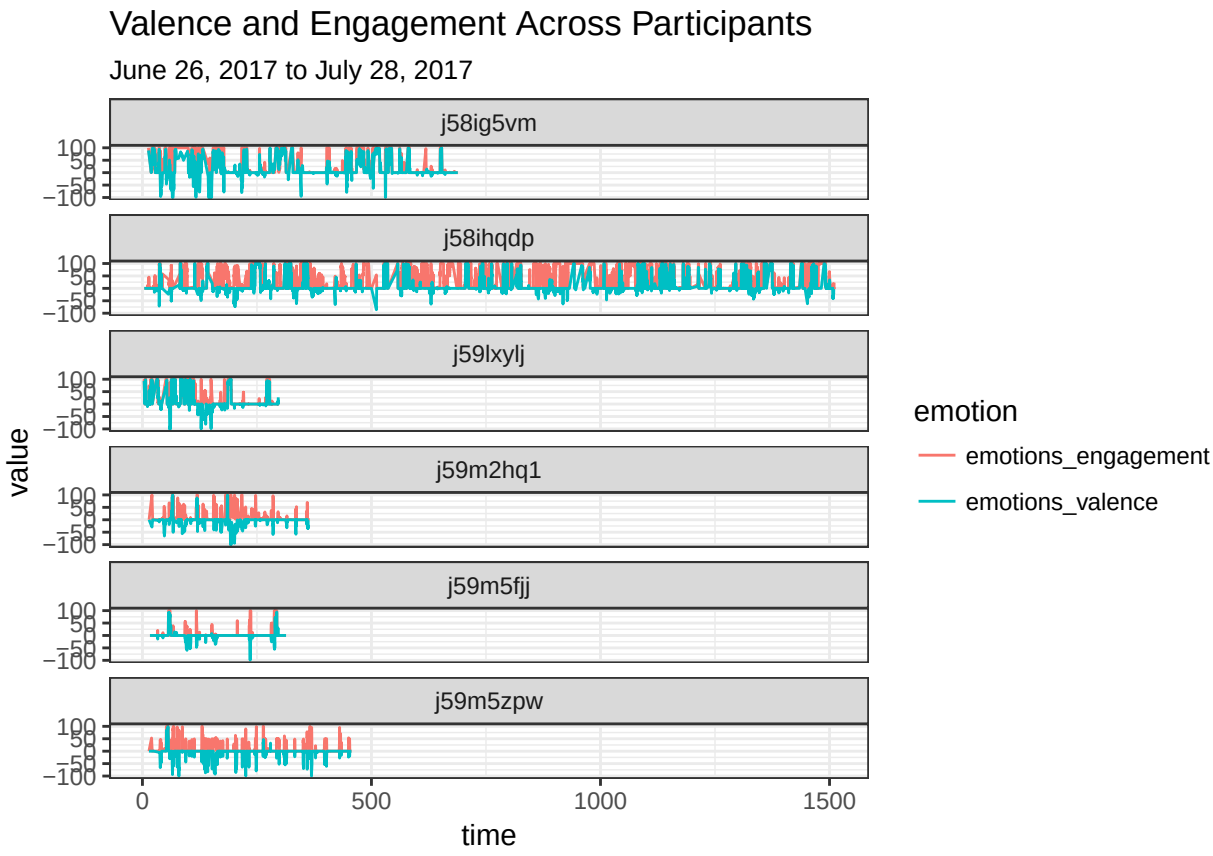



```
ggsave("img/emotionspos.pdf", width = 20, height = 10, units = "in")
```

Engagement and Valence Graphed

```
library(tidyverse)
library(devtools)
library(ggplot2)

emo <- read.csv('data/emotion_data2.csv', header=TRUE)
emo2 <- emo %>%
  gather(
    `emotions_valence`,
    `emotions_engagement`,
    key = "emotion",
    value = "value") %>%
  select(emotion, value, time, key)
ggplot(emo2) +
  geom_line(aes(x=time, y=value, colour=emotion)) +
  facet_wrap(~ key, ncol=1) +
  labs(title ="Valence and Engagement Across Participants", subtitle="June 26, 2017 to July 28, 2017") +
  theme_bw()
```




```
ggsave("img/emotionsvalandeng.pdf", width = 20, height = 9, units = "in")
```

Error Mean Values

```
trial_data2 <- read_csv("data/trial_data2.csv")
```

```
## Parsed with column specification:
## cols(
##   key = col_character(),
##   name = col_character(),
##   num = col_integer(),
##   chartType = col_character(),
##   targetA = col_integer(),
##   targetB = col_integer(),
##   actualDiff = col_double(),
##   input = col_double(),
##   time = col_double(),
##   chartData_1 = col_integer(),
##   chartData_2 = col_integer(),
##   chartData_3 = col_integer(),
##   chartData_4 = col_integer(),
##   chartData_5 = col_integer(),
##   chartData_6 = col_integer(),
##   chartData_7 = col_integer(),
##   chartData_8 = col_integer(),
##   chartData_9 = col_integer(),
##   chartData_10 = col_integer()
## )
```

```
#data_3_participants $ actualDifference <- as.numeric(as.character(data_3_participants $ actualDifferen
# data_3_participants $ input <- as.numeric(as.character(data_3_participants $ input))
#
trial_data2 $ error <- trial_data2 $ actualDiff - trial_data2 $ input
trial_data2 $ absError = abs(trial_data2 $ error)
trial_data2 $ logError <- log2(abs(trial_data2 $ input - trial_data2 $ actualDiff) + 1/8)
trial_data2 $ logError <- abs(trial_data2 $ logError)
trial_data2 $ logError[trial_data2 $ logError == 3] <- 0

mean(trial_data2 $ logError)
```

```
## [1] 2.144671
```

Mean Negative Emotions

```
emo <- read.csv('data/emotion_data2.csv', header=TRUE)
emo2 <- emo %>%
  gather(
    `emotions_sadness`,
    `emotions_disgust`,
    `emotions_contempt`,
    `emotions_anger`,
    `emotions_fear`,
    key = "emotion",
    value = "value") %>%
  select(emotion, value, time, key)

 emo2 $ value <- as.numeric(as.character(emo2 $ value))

 mean(emo2 $ value)
```

```
## [1] 1.520311
```

Another Way to Calculate Mean Negative Emotions

```
#y <- c(Jack$emotions_anger, Jack$emotions_contempt, Jack$emotions_disgust, Jack$emotions_fear, Jack$em
#mean(y)
```

Mean Positive Emotions

```
emo <- read.csv('data/emotion_data2.csv', header=TRUE)
emo2 <- emo %>%
  gather(
    `emotions_surprise`,
    `emotions_joy`,
    key = "emotion",
    value = "value") %>%
  select(emotion, value, time, key)

 emo2 $ value <- as.numeric(as.character(emo2 $ value))

 mean(emo2 $ value)
```

```
## [1] 10.02067
```

Another Way to Calculate Mean Positive Emotions

```
#x <- c(Jack$emotions_joy, Jack$emotions_surprise)
#mean(x)
```