Gender Processing of Gendered and Gender-Neutral Professional and Personal Titles

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#Importing Libraries and Setting Up Data

Import Necessary Libraries

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

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.0 --
```

```
## v tibble  3.0.5      v dplyr   1.0.3
## v tidyr   1.1.2      v stringr 1.4.0
## v readr   1.4.0      v forcats 0.5.0
## v purrr   0.3.4
```

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

Import Dataset and filter out example trials

```
all_data <- read.csv('gender_processing_a_selfpaced_reading_time_study-merged.csv') %>%
  filter(trial_id != 'example')
```

Summarise the Dataset

```
summary(all_data)
```

```
##     workerid     proliferate.condition  condition            form
##  Min.   :125.0   Length:36000          Length:36000       Length:36000
##  1st Qu.:179.5   Class :character      Class :character   Class :character
##  Median :234.5   Mode  :character      Mode  :character   Mode  :character
##  Mean   :234.5
##  3rd Qu.:289.2
##  Max.   :341.0
```

```
##
##      lexeme              name              region          response_correct
##  Length:36000       Length:36000       Length:36000       Min.   :0.0000
##  Class :character   Class :character   Class :character   1st Qu.:1.0000
##  Mode  :character   Mode  :character   Mode  :character   Median :1.0000
##                                                           Mean   :0.9523
##                                                           3rd Qu.:1.0000
##                                                           Max.   :1.0000
##
##       rt            trial_id          trial_no        word_idx
##  Min.   :    2.0   Length:36000       Min.   : 1.00   Min.   :0
##  1st Qu.:  315.0   Class :character   1st Qu.: 5.75   1st Qu.:2
##  Median :  408.0   Mode  :character   Median :10.50   Median :4
##  Mean   :  504.1                      Mean   :10.50   Mean   :4
##  3rd Qu.:  545.0                      3rd Qu.:15.25   3rd Qu.:6
##  Max.   :39051.0                      Max.   :20.00   Max.   :8
##
##  subject_information.age subject_information.asses subject_information.comments
##  Min.   :18.00           Length:36000              Length:36000
##  1st Qu.:23.00           Class :character          Class :character
##  Median :30.00           Mode  :character          Mode  :character
##  Mean   :32.69
##  3rd Qu.:36.00
##  Max.   :74.00
##  NA's   :360
##  subject_information.education subject_information.enjoyment
##  Min.   :-1.00                 Min.   :0.00
##  1st Qu.: 2.00                 1st Qu.:1.00
##  Median : 3.00                 Median :2.00
##  Mean   : 2.54                 Mean   :1.67
##  3rd Qu.: 3.00                 3rd Qu.:2.00
##  Max.   : 4.00                 Max.   :2.00
##
##  subject_information.gender subject_information.gender_q1
##  Length:36000               Min.   :  0.00
##  Class :character           1st Qu.: 83.00
##  Mode  :character           Median : 97.00
##                             Mean   : 89.84
##                             3rd Qu.:100.00
##                             Max.   :100.00
##
##  subject_information.gender_q10 subject_information.gender_q11
##  Min.   :  0.00                 Min.   :  0.00
##  1st Qu.:  0.00                 1st Qu.:  0.00
##  Median : 12.50                 Median : 28.50
##  Mean   : 21.07                 Mean   : 32.72
##  3rd Qu.: 36.00                 3rd Qu.: 59.00
##  Max.   :100.00                 Max.   :100.00
##
##  subject_information.gender_q12 subject_information.gender_q13
##  Min.   :  0.0                  Min.   :  0.00
##  1st Qu.:  0.0                  1st Qu.:  0.00
##  Median : 15.5                  Median : 1.00
##  Mean   : 26.1                  Mean   : 14.17
```

```
##   3rd Qu.: 51.0                     3rd Qu.: 19.00
##   Max.   :100.0                     Max.    :100.00
##
##   subject_information.gender_q2 subject_information.gender_q3
##   Min.   : 20.00                Min.   :  1.00
##   1st Qu.: 90.00                1st Qu.: 88.75
##   Median :100.00                Median :100.00
##   Mean   : 91.98                Mean   : 91.64
##   3rd Qu.:100.00                3rd Qu.:100.00
##   Max.   :100.00                Max.   :100.00
##
##   subject_information.gender_q4 subject_information.gender_q5
##   Min.   :  0.00                Min.   :  0.00
##   1st Qu.: 90.00                1st Qu.: 68.00
##   Median :100.00                Median : 91.50
##   Mean   : 90.11                Mean   : 80.39
##   3rd Qu.:100.00                3rd Qu.:100.00
##   Max.   :100.00                Max.   :100.00
##
##   subject_information.gender_q6 subject_information.gender_q7
##   Min.   :  0.00                Min.   :  0.00
##   1st Qu.: 29.50                1st Qu.:  8.75
##   Median : 51.00                Median : 40.00
##   Mean   : 49.63                Mean   : 35.87
##   3rd Qu.: 69.25                3rd Qu.: 53.25
##   Max.   :100.00                Max.   :100.00
##
##   subject_information.gender_q8 subject_information.gender_q9
##   Min.   :  0.00                Min.   :  0.00
##   1st Qu.:  0.00                1st Qu.:  1.50
##   Median : 21.50                Median : 24.00
##   Mean   : 31.86                Mean   : 27.84
##   3rd Qu.: 59.25                3rd Qu.: 49.00
##   Max.   :100.00                Max.   :100.00
##
##   subject_information.language subject_information.party_alignment
##   Length:36000                Min.   :1.000
##   Class :character            1st Qu.:3.000
##   Mode  :character            Median :4.000
##                               Mean   :3.722
##                               3rd Qu.:5.000
##                               Max.   :5.000
##                               NA's   :360
##   subject_information.price system.Browser      system.OS
##   Min.   :0.000            Length:36000        Length:36000
##   1st Qu.:1.000            Class :character    Class :character
##   Median :1.000            Mode  :character    Mode  :character
##   Mean   :0.965
##   3rd Qu.:1.000
##   Max.   :1.000
##
##   system.screenH   system.screenW time_in_minutes   error
##   Min.   : 614.0   Min.   :1092   Min.   : 2.181   Mode:logical
##   1st Qu.: 800.0   1st Qu.:1366   1st Qu.: 3.764   NA's:36000
```

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```
## Median : 900.0   Median :1536   Median : 4.848
## Mean   : 929.3   Mean   :1603   Mean   : 5.382
## 3rd Qu.:1080.0   3rd Qu.:1920   3rd Qu.: 6.122
## Max.   :1440.0   Max.   :2560   Max.   :30.623
##
```

Adding in Gender Trascendence and Gender-Linked Subscales

Defining Subscore Groups

```
gender_transcendence_cols <- c('subject_information.gender_q1','subject_information.gender_q2','subject_
gender_linked_cols <- c('subject_information.gender_q6','subject_information.gender_q7','subject_informa
```

Adding the subscore columns

```
all_data <- all_data %>%
  mutate(gender_trans = 100 - (rowMeans(all_data[gender_transcendence_cols]))) %>%
  mutate(gender_link = rowMeans(all_data[gender_linked_cols]))
```

Adding Gender and Morph_Type Columns

```
all_data <- all_data %>%
  mutate(trial_gender = ifelse(condition=='neutral_female' | condition == 'congruent_female','female','m
  mutate(morph_type = ifelse(lexeme!= 'actor' & lexeme!= 'host' & lexeme !='hunter' & lexeme!= 'villain
```

Adding Congruency Column

```
all_data <- all_data %>%
  mutate(trial_congruency = ifelse(condition=='congruent_male' | condition == 'congruent_female','congru
```

Review summary with new columns

```
summary(all_data)
```

```
##      workerid      proliferate.condition  condition            form
##  Min.   :125.0   Length:36000          Length:36000        Length:36000
##  1st Qu.:179.5   Class :character      Class :character    Class :character
##  Median :234.5   Mode  :character      Mode  :character    Mode  :character
##  Mean   :234.5
##  3rd Qu.:289.2
##  Max.   :341.0
##
```

```
##     lexeme              name                region           response_correct
## Length:36000        Length:36000        Length:36000        Min.   :0.0000
## Class :character    Class :character    Class :character    1st Qu.:1.0000
## Mode  :character    Mode  :character    Mode  :character    Median :1.0000
##                                                             Mean   :0.9523
##                                                             3rd Qu.:1.0000
##                                                             Max.   :1.0000
##
##       rt            trial_id           trial_no         word_idx
## Min.   :    2.0  Length:36000       Min.   : 1.00   Min.   :0
## 1st Qu.:  315.0  Class :character   1st Qu.: 5.75   1st Qu.:2
## Median :  408.0  Mode  :character   Median :10.50   Median :4
## Mean   :  504.1                     Mean   :10.50   Mean   :4
## 3rd Qu.:  545.0                     3rd Qu.:15.25   3rd Qu.:6
## Max.   :39051.0                     Max.   :20.00   Max.   :8
##
## subject_information.age subject_information.asses subject_information.comments
## Min.   :18.00           Length:36000              Length:36000
## 1st Qu.:23.00           Class :character          Class :character
## Median :30.00           Mode  :character          Mode  :character
## Mean   :32.69
## 3rd Qu.:36.00
## Max.   :74.00
## NA's   :360
## subject_information.education subject_information.enjoyment
## Min.   :-1.00                 Min.   :0.00
## 1st Qu.: 2.00                 1st Qu.:1.00
## Median : 3.00                 Median :2.00
## Mean   : 2.54                 Mean   :1.67
## 3rd Qu.: 3.00                 3rd Qu.:2.00
## Max.   : 4.00                 Max.   :2.00
##
## subject_information.gender subject_information.gender_q1
## Length:36000               Min.   :  0.00
## Class :character           1st Qu.: 83.00
## Mode  :character           Median : 97.00
##                            Mean   : 89.84
##                            3rd Qu.:100.00
##                            Max.   :100.00
##
## subject_information.gender_q10 subject_information.gender_q11
## Min.   :  0.00                 Min.   :  0.00
## 1st Qu.:  0.00                 1st Qu.:  0.00
## Median : 12.50                 Median : 28.50
## Mean   : 21.07                 Mean   : 32.72
## 3rd Qu.: 36.00                 3rd Qu.: 59.00
## Max.   :100.00                 Max.   :100.00
##
## subject_information.gender_q12 subject_information.gender_q13
## Min.   :  0.0                  Min.   :  0.00
## 1st Qu.:  0.0                  1st Qu.:  0.00
## Median : 15.5                  Median :  1.00
## Mean   : 26.1                  Mean   : 14.17
## 3rd Qu.: 51.0                  3rd Qu.: 19.00
```

```
## Max.    :100.0              Max.    :100.00
##
## subject_information.gender_q2 subject_information.gender_q3
## Min.    : 20.00              Min.    :  1.00
## 1st Qu.: 90.00               1st Qu.: 88.75
## Median :100.00               Median :100.00
## Mean    : 91.98              Mean    : 91.64
## 3rd Qu.:100.00               3rd Qu.:100.00
## Max.    :100.00              Max.    :100.00
##
## subject_information.gender_q4 subject_information.gender_q5
## Min.    :  0.00              Min.    :  0.00
## 1st Qu.: 90.00               1st Qu.: 68.00
## Median :100.00               Median : 91.50
## Mean    : 90.11              Mean    : 80.39
## 3rd Qu.:100.00               3rd Qu.:100.00
## Max.    :100.00              Max.    :100.00
##
## subject_information.gender_q6 subject_information.gender_q7
## Min.    :  0.00              Min.    :  0.00
## 1st Qu.: 29.50               1st Qu.:  8.75
## Median : 51.00               Median : 40.00
## Mean    : 49.63              Mean    : 35.87
## 3rd Qu.: 69.25               3rd Qu.: 53.25
## Max.    :100.00              Max.    :100.00
##
## subject_information.gender_q8 subject_information.gender_q9
## Min.    :  0.00              Min.    :  0.00
## 1st Qu.:  0.00               1st Qu.:  1.50
## Median : 21.50               Median : 24.00
## Mean    : 31.86              Mean    : 27.84
## 3rd Qu.: 59.25               3rd Qu.: 49.00
## Max.    :100.00              Max.    :100.00
##
## subject_information.language subject_information.party_alignment
## Length:36000                Min.    :1.000
## Class :character            1st Qu.:3.000
## Mode  :character            Median :4.000
##                             Mean    :3.722
##                             3rd Qu.:5.000
##                             Max.    :5.000
##                             NA's    :360
## subject_information.price system.Browser      system.OS
## Min.    :0.000           Length:36000        Length:36000
## 1st Qu.:1.000            Class :character    Class :character
## Median :1.000            Mode  :character    Mode  :character
## Mean    :0.965
## 3rd Qu.:1.000
## Max.    :1.000
##
## system.screenH   system.screenW time_in_minutes    error
## Min.    : 614.0  Min.    :1092   Min.    : 2.181   Mode:logical
## 1st Qu.: 800.0   1st Qu.:1366    1st Qu.: 3.764    NA's:36000
## Median : 900.0   Median :1536    Median : 4.848
```
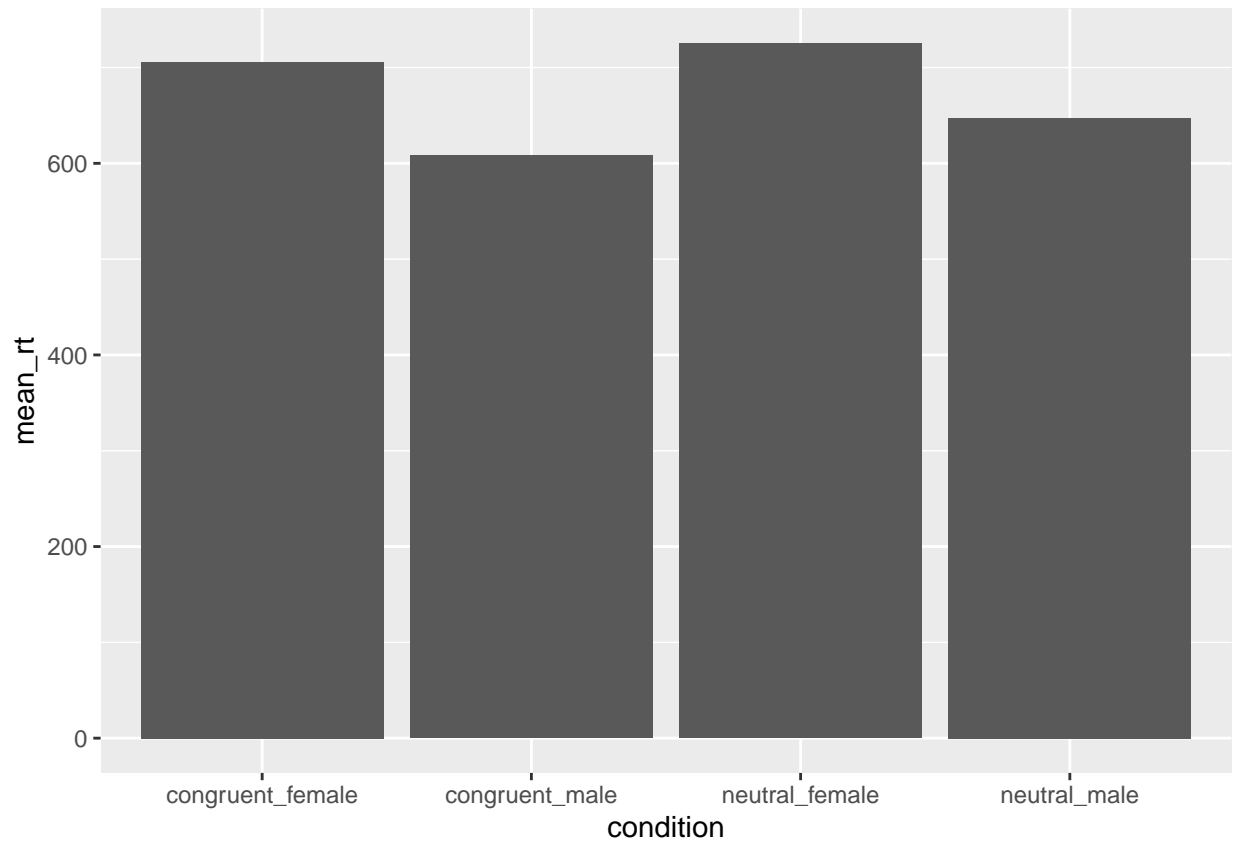
```
## Mean   : 929.3   Mean   :1603   Mean   : 5.382
## 3rd Qu.:1080.0   3rd Qu.:1920   3rd Qu.: 6.122
## Max.   :1440.0   Max.   :2560   Max.   :30.623
##
## gender_trans     gender_link     trial_gender       morph_type
## Min.   : 0.00   Min.   : 0.00   Length:36000     Length:36000
## 1st Qu.: 0.40   1st Qu.:13.62   Class :character   Class :character
## Median : 7.50   Median :27.75   Mode  :character   Mode  :character
## Mean   :11.21   Mean   :29.91
## 3rd Qu.:18.00   3rd Qu.:43.28
## Max.   :62.60   Max.   :85.88
##
## trial_congruency
## Length:36000
## Class :character
## Mode  :character
##
##
##
##
```

Filter out non-critical data points
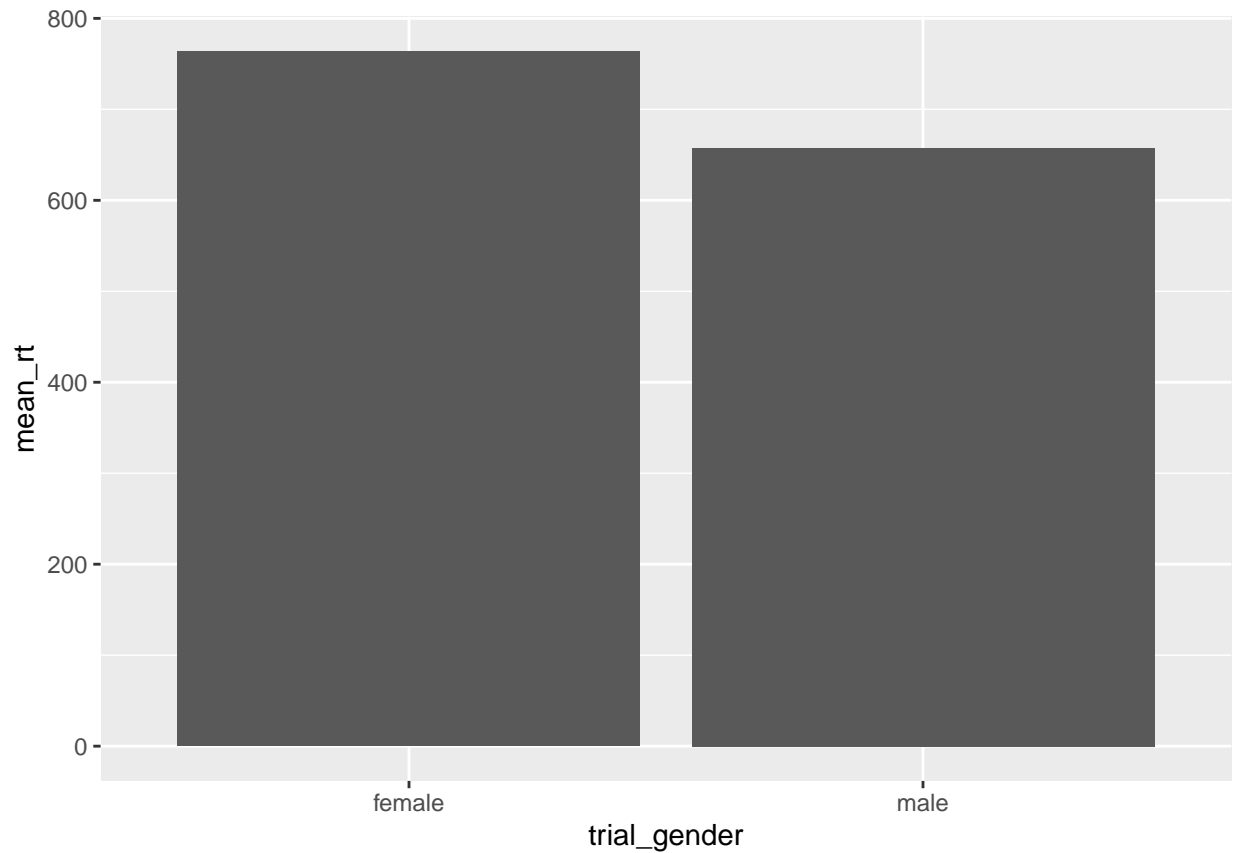
```
all_data <- all_data %>%
  filter(region=='critical')
```
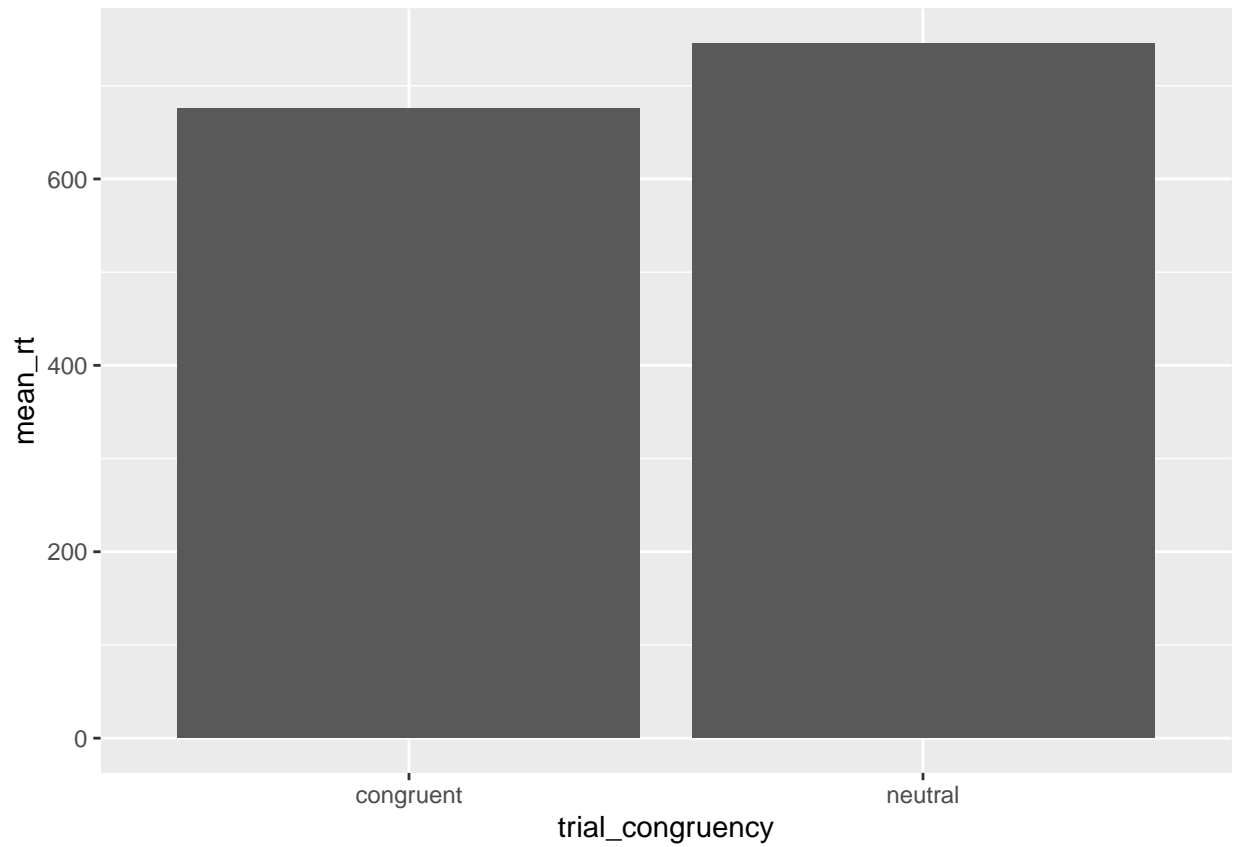
Data Visualisation

```
all_data %>%
  group_by(condition) %>%
  summarise(mean_rt = mean(rt)) %>%
  ggplot(aes(x= condition, y=mean_rt)) +
  geom_col()
```

```
all_data %>% filter(lexeme!= 'actor' & lexeme!= 'host' & lexeme !='hunter' & lexeme!= 'villain' & lexeme
  group_by(trial_gender) %>%
  summarise(mean_rt = mean(rt)) %>%
  ggplot(aes(x= trial_gender, y=mean_rt)) +
  geom_col()
```

```
all_data %>%
  filter(lexeme!= 'actor' & lexeme!= 'host' & lexeme !='hunter' & lexeme!= 'villain' & lexeme!= 'heir' &
  group_by(trial_congruency) %>%
  summarise(mean_rt = mean(rt)) %>%
  ggplot(aes(x= trial_congruency, y=mean_rt)) +
  geom_col()
```

```
all_data %>%
  group_by(morph_type) %>%
  summarise(mean_rt = mean(rt)) %>%
  ggplot(aes(x= morph_type, y=mean_rt)) +
  geom_col()
```