

# Stroop

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```
# Load packages for data handling and plotting
pacman::p_load(tidyverse)

# clear global environment
rm(list = ls())

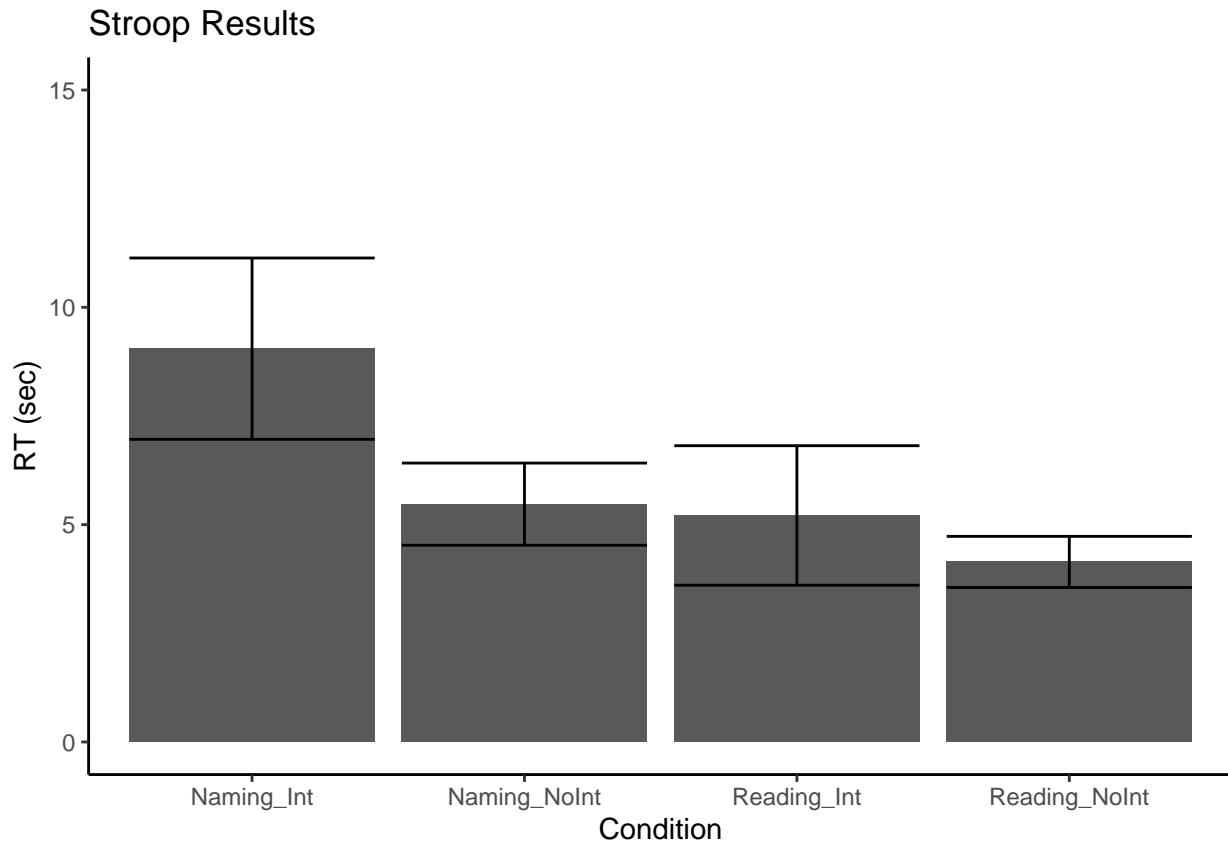
# read in the data
df <- read.csv("/Users/ethan/Documents/GitHub/ethanweed.github.io/r-tutorials/data/Stroop-raw-over-the-")
df$Year <- NULL

# make a new dataframe with the same data in the "long" format.
df <- gather(df, key = "Condition", value = "Time", -Year)

# get condition means and SD's
RT <- colMeans(df)
Stdev <- unname(sapply(df, sd, na.rm = TRUE))
Condition <- colnames(df)

# gather aggregated data in to dataframe
data <- data.frame(Condition, RT, Stdev)

# make a barplot with error bars
ggplot(data, aes(x = Condition, y = RT)) +
  geom_col() +
  geom_errorbar(ymax = RT + Stdev, ymin = RT - Stdev) +
  ylim(0,15) +
  labs(title = "Stroop Results",
       y = "RT (sec)") +
  theme_classic()
```



```
# calculate ANOVA
pacman::p_load(lmerTest, pandr)

df <- read.csv("/Users/ethan/Documents/GitHub/ethanweed.github.io/r-tutorials/data/Stroop-raw-over-the-")

df$ID <- seq(1:length(df$Naming_Int))

df_long <- gather(df, key = "Condition", value = "Time", -Year, -ID)

# set up column with task categories
df_long$Task <- ifelse(df_long$Condition == 'Reading_Int'
                      | df_long$Condition == 'Reading_NoInt',
                      "Reading", "Naming")
df_long$Interference <- ifelse(df_long$Condition == 'Reading_Int'
                              | df_long$Condition == 'Naming_Int',
                              'Interference', 'No_Interference')

# Define our model. Here, we are predicting Time as modeled by Task, Interference,
#and the interaction of Task and Interference. We are modelling ID as a "random effect".

mod <- lmer(Time ~ Task + Interference + Task*Interference + (1|ID), data=df_long)
ans <- anova(mod)

# Display the ANOVA results in a nice table
library(pander)
```

`pander(ans)`

Table 1: Type III Analysis of Variance Table with Satterthwaite's method

	Sum Sq	Mean Sq	NumDF	DenDF	F value	Pr(>F)
<b>Task</b>	693.9	693.9	1	309	476.8	1.378e-64
<b>Interference</b>	561.3	561.3	1	309	385.6	2.7e-56
<b>Task:Interference</b>	163.5	163.5	1	309	112.4	1.35e-22