Dissertation ANOVA

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The data used for this ANOVA were collected for my doctoral dissertation. The focal hypothesis of this dissertation was that exposing women to different audio stimuli would result in changes to their vaginal pH. Across 4 sessions, participants were exposed to 4 different audio stories depicting (1) a neutral interaction between a man and a women, (2) consensual sex, (3) non- consensual sex, and (4) a non-sexual, violent assault. Participants experienced all 4 audio conditions (within-subjects) and vaginal pH was measured before and after women were exposed to each audio condition. We can use an ANOVA to determine whether there were differences in the change of vaginal pH across conditions. Specifically, my dissertation predicted that vaginal pH would show the largest change in the non-consensual sex condition.

Let's first load the raw data file.

```
df <- read_csv("DISS RETURNS.csv")
```

```
## Rows: 58 Columns: 198
## -- Column specification -------------------------------------------------------
## Delimiter: ","
## dbl (198): P_ID, A_Tampon_Mass, A_pH_Before, A_pH_After, A_pH_CHANGE, A_Fert...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

Then we want to create a subset of the data with only our variables of interest: pH change in each of the 4 conditions.

```
subset_df <- df %>%
  select(P_ID, A_pH_CHANGE, B_pH_CHANGE, C_pH_CHANGE, D_pH_CHANGE)
```

Currently, the data is organized such that pH change for each of the 4 conditions is in a separate column, but to conduct in ANOVA in R, we want to, essentially, "flip" the data longways so that pH change for all 4 conditions appears in the same column, with a separate row to indicate the experimental condition.

```
df_long <- subset_df %>%
  gather(key = "Condition", value = "pH_Change", -P_ID)
```

There are also some missing values we need to exclude.

```
df_long <- na.omit(df_long)
```

Now we can fit the model and get a summary of the results.

```
model <- aov(pH_Change ~ Condition + Error(P_ID/Condition), data = df_long)
```

```
result <- summary(model)
```

```
result
```

```
##
## Error: P_ID
##           Df Sum Sq Mean Sq F value Pr(>F)
## Residuals  1 0.2832  0.2832
```

```
##
## Error: P_ID:Condition
##           Df Sum Sq Mean Sq
## Condition  3  1.123  0.3744
##
## Error: Within
##            Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.629  0.2097   1.662  0.177
## Residuals 164 20.690  0.1262
```

It looks like the ANOVA revealed no significant differences between groups, which implies that the different audio stimuli did not have a significant impact on vaginal pH.

The analyses presented here were only meant to demonstrate a basic, one-way ANOVA with 4 groups, one continuous outcome variable, and no covariates. For a more detailed report, with more advanced statistical analyses, please see my "Doctoral Dissertation" repository on github (under construction). There, I plan to provide a more thorough breakdown of how I organized, analyzed, and interpreted the data used for my dissertation.