Two-way Factorial ANOVA

Interactions

Dr. Sarah Schwartz

Spring 2020

Preparation

Packages

```
library(tidyverse)
library(furniture)
library(afex)
library(emmeans)
```

Functions

Data Generation

- Row Factor = `drug`, 2 levels
  1. `Antidepressant`
  2. `Placebo`
- Column Factor = `therapy`, 3 levels
  1. `Psychoanalysis`
  2. `Group Therapy`
  3. `Behavior Modification`

Function Options: * `mu_j` = cell means vector, *default = 2* * `n_j` = cell sub-sample size vector, *default = 10* * `sd_j` = cell standard deviation vector, *default = 1.75*

all vectors are lengeht 6, or recycled if shorter

```
gen2x3 <- function(mu_j = 2,
                   n_j  = 10,
                   sd_j = 1.75){
  expand.grid(drug    = c("Antidepressant",
                          "Placebo"),
              therapy = c("Psychoanalysis",
                          "Group Therapy",
                          "Behavior Modification")) %>%
    dplyr::mutate(mean = mu_j) %>%
    dplyr::mutate(panic = purrr::map(mean,
                                     rnorm,
                                     n = n_j,
                                     sd = sd_j)) %>%
    tidyr::unnest(panic) %>%
    dplyr::mutate(id = row_number()) %>%
    dplyr::group_by(drug, therapy) %>%
    dplyr::mutate(rep = row_number()) %>%
    dplyr::ungroup() %>%
    dplyr::select(id, rep, drug, therapy, panic)
}
```

Two-way Means Table

```
# df_0 %>%
#   dplyr::select(-id) %>%
#   tidyr::pivot_wider(names_from = drug,
#                      values_from = panic) %>%
#   dplyr::select(-rep) %>%
#   dplyr::group_by(therapy) %>%
#   furniture::table1(digits = 3)
```

Generate Datasets

Set random seed

```
set.seed(1)
```

Datasets

```
df_0 <- gen2x3() # all defaults

df_0
```

```
# A tibble: 60 x 5
      id   rep drug           therapy        panic
   <int> <int> <fct>          <fct>          <dbl>
 1     1     1 Antidepressant Psychoanalysis 0.904
 2     2     2 Antidepressant Psychoanalysis 2.32
 3     3     3 Antidepressant Psychoanalysis 0.538
 4     4     4 Antidepressant Psychoanalysis 4.79
 5     5     5 Antidepressant Psychoanalysis 2.58
 6     6     6 Antidepressant Psychoanalysis 0.564
 7     7     7 Antidepressant Psychoanalysis 2.85
 8     8     8 Antidepressant Psychoanalysis 3.29
 9     9     9 Antidepressant Psychoanalysis 3.01
10    10    10 Antidepressant Psychoanalysis 1.47
# ... with 50 more rows
```