Lab 10

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Wed May 12 2021

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Problem 1: Ch 20 Example (3 points)

dataset written out

```
bat_hat_data <- tribble(~Subject,
                  ~Phonological_Similairty,
                  ~Age,
                  ~num_correct,
                  "s1", "b1", "a1", 15,
                  "s2", "b1", "a1", 23,
                  "s3", "b1", "a1", 12,
                  "s4", "b1", "a1", 16,
                  "s5", "b1", "a1", 14,
                  "s1", "b2", "a1", 13,
                  "s2", "b2", "a1", 19,
                  "s3", "b2", "a1", 10,
                  "s4", "b2", "a1", 16,
                  "s5", "b2", "a1", 12,
                  "s6", "b1", "a2", 39,
                  "s7", "b1", "a2", 31,
                  "s8", "b1", "a2", 40,
                  "s9", "b1", "a2", 32,
                  "s10","b1", "a2", 38,
                  "s6", "b2", "a2", 29,
                  "s7", "b2", "a2", 15,
                  "s8", "b2", "a2", 30,
                  "s9", "b2", "a2", 26,
                  "s10", "b2", "a2", 30)

aov_out <- aov(num_correct ~ Phonological_Similairty*Age + Error(Subject/Phonological_Similairty), data = bat_hat_data) %>% summa
```

another way to create a dataset

```
Subject <- c(rep(c("s1","s2","s3","s4","s5"),2),
       rep(c("s6","s7","s8","s9","s10"),2))
Phonological_Similarity <- rep(rep(c("b1", "b2"),each=5),2)
Age <- rep(c("a1","a2"), each = 10)
num_correct <- c(15,23,12,16,14,
                 13,19,10,16,12,
                 39,31,40,32,38,
                 29,15,30,26,30)

bat_hat_data <- tibble(Subject,
                  Phonological_Similarity,
                  Age,
                  num_correct)

aov_out <- aov(num_correct ~ Phonological_Similarity*Age + Error(Subject/Phonological_Similarity), data = bat_hat_data) %>% summa

aov_out
```

```
##
## Error: Subject
##           Df Sum Sq Mean Sq F value   Pr(>F)
## Age        1   1280    1280      32 0.000478 ***
## Residuals  8    320      40
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Error: Subject:Phonological_Similarity
##                            Df Sum Sq Mean Sq F value   Pr(>F)
## Phonological_Similarity     1    180     180      45 0.000151 ***
## Phonological_Similarity:Age 1     80      80      20 0.002077 **
## Residuals                   8     32       4
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Problem 2: Ch 21 Example (3 Points)

```
subject <- rep(c("s1","s2","s3","s4"),each=10)
Typicality_B <- rep(rep(c("b1","b2"),each=5),4)
Faces_A <- rep(c("a1","a2","a3","a4","a5"),8)

#Faces_A <- rep(c("a1","a2","a3","a4","a5",       "a6","a7","a8","a9","a10"),4)

centiseconds <- c(20,22,25,24,19,37,37,43,48,45,
                  9,8,21,21,21,34,35,35,37,39,
                  18,20,18,21,33,35,39,39,37,40,
                  5,14,16,22,23,38,49,51,50,52)

face_data <- tibble(subject,
                    Typicality_B,
                    Faces_A,
                    centiseconds)


aov_out <- aov(centiseconds ~ (subject + Typicality_B + Faces_A:Typicality_B + Typicality_B:subject), data = face_data) %>% summary

aov_out
```

```
##                    Df Sum Sq Mean Sq F value   Pr(>F)
## subject             3    240      80   5.333 0.005853 **
## Typicality_B        1   4840    4840 322.667 2.02e-15 ***
## Typicality_B:Faces_A  8    480      60   4.000 0.003887 **
## subject:Typicality_B  3    360     120   8.000 0.000722 ***
## Residuals          24    360      15
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```