**Data Science HW4 Total: 20 points Due: February 1st, 2019, NOON**

1. **In your own words, specify the research question(s) (2 sentences or less) [4]**

Does contextual information about cleanliness/contamination of food change children’s food preferences and amount consumed and are possible differences in preference consistent for all age groups tested?

1. **Include and explain IVs, DVs. [4]**

IV: food type (clean vs contaminated), age, gender

DV: consumption (measured in bites), which food the children tasted first, whether children ate anything, yumminess scale ratings

1. **R section (please complete the following and include your script and outputs as in-line text below)**
   1. *Consumption* Repeated Measures ANOVA + etasquared[4]
      1. Identify the type of rm ANOVA and explain why this was an appropriate method to analyze the data [1]
         * Type 2 RM ANOVA was used because we are interested in the same children across 2 conditions (clean/contaminated)
      2. The authors found a significant interaction: report this result in your own words [1]
         * There was an interaction between age and food choice. There are significant differences in food type consumed by age group. For example, for younger age groups food type mattered less than for older age groups
   2. *Scale Ratings* Repeated Measures ANOVA + etasquared [4
      1. Identify the type of rm ANOVA and explain why this was an appropriate method to analyze the data [1]
         * Study design type 2 RM ANOVA where group is the between subjects factor because we are interested in the same children across the two levels of food type (clean/contaminated)
      2. The authors found a significant interaction: report this result in your own words [1]
         * There was an interaction between age and food choice. There are significant differences in scale ratings by age group. For example, for younger age groups food type mattered less than for older age groups

hw\_04

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1/30/2019

# load libraries  
library(tidyverse)

## ── Attaching packages ─────────────────────────────────────── tidyverse 1.2.1 ──

## ✔ ggplot2 3.1.0 ✔ purrr 0.2.5  
## ✔ tibble 1.4.2 ✔ dplyr 0.7.7  
## ✔ tidyr 0.8.2 ✔ stringr 1.3.1  
## ✔ readr 1.1.1 ✔ forcats 0.3.0

## ── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
## ✖ dplyr::filter() masks stats::filter()  
## ✖ dplyr::lag() masks stats::lag()

library(Hmisc)

## Loading required package: lattice

## Loading required package: survival

## Loading required package: Formula

##   
## Attaching package: 'Hmisc'

## The following objects are masked from 'package:dplyr':  
##   
## src, summarize

## The following objects are masked from 'package:base':  
##   
## format.pval, units

library(afex)

## Loading required package: lme4

## Loading required package: Matrix

##   
## Attaching package: 'Matrix'

## The following object is masked from 'package:tidyr':  
##   
## expand

## \*\*\*\*\*\*\*\*\*\*\*\*  
## Welcome to afex. For support visit: http://afex.singmann.science/

## - Functions for ANOVAs: aov\_car(), aov\_ez(), and aov\_4()  
## - Methods for calculating p-values with mixed(): 'KR', 'S', 'LRT', and 'PB'  
## - 'afex\_aov' and 'mixed' objects can be passed to emmeans() for follow-up tests  
## - NEWS: library('emmeans') now needs to be called explicitly!  
## - Get and set global package options with: afex\_options()  
## - Set orthogonal sum-to-zero contrasts globally: set\_sum\_contrasts()  
## - For example analyses see: browseVignettes("afex")  
## \*\*\*\*\*\*\*\*\*\*\*\*

##   
## Attaching package: 'afex'

## The following object is masked from 'package:lme4':  
##   
## lmer

library(tidyr)  
library(effsize)  
  
taste <- spss.get("ST.sav", use.value.labels = TRUE)

#check uniqueness  
length(taste$subnum)

## [1] 60

length(unique(taste$subnum))

## [1] 60

#gather  
tastebite <- gather(data = taste,  
 key = foodtype,  
 value = bites,  
 clean.bites.tot, contam.bites.tot)  
  
consumption = aov\_ez("subnum", "bites", tastebite,  
 between = c("age.group", "gender"),  
 within = c("foodtype"),  
 anova\_table = list(es ="pes"))

## Contrasts set to contr.sum for the following variables: age.group, gender

print(consumption)

## Anova Table (Type 3 tests)  
##   
## Response: bites  
## Effect df MSE F pes p.value  
## 1 age.group 2, 54 42.25 1.21 .04 .31  
## 2 gender 1, 54 42.25 0.00 <.0001 .96  
## 3 age.group:gender 2, 54 42.25 0.20 .007 .82  
## 4 foodtype 1, 54 21.37 11.27 \*\* .17 .001  
## 5 age.group:foodtype 2, 54 21.37 4.86 \* .15 .01  
## 6 gender:foodtype 1, 54 21.37 0.48 .009 .49  
## 7 age.group:gender:foodtype 2, 54 21.37 1.31 .05 .28  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '+' 0.1 ' ' 1

tasteyummy <- gather(data = tastebite,  
 key = taste,  
 value = preference,  
 yummy.clean, yummy.contam)   
  
yummy = aov\_ez("subnum", "preference", tasteyummy,  
 between = c("age.group", "gender"),  
 within = c("taste"),  
 anova\_table = list(es ="pes"))

## Warning: More than one observation per cell, aggregating the data using  
## mean (i.e, fun\_aggregate = mean)!

## Contrasts set to contr.sum for the following variables: age.group, gender

print(yummy)

## Anova Table (Type 3 tests)  
##   
## Response: preference  
## Effect df MSE F pes p.value  
## 1 age.group 2, 54 1.59 0.31 .01 .74  
## 2 gender 1, 54 1.59 0.00 <.0001 .98  
## 3 age.group:gender 2, 54 1.59 1.00 .04 .38  
## 4 taste 1, 54 1.70 24.34 \*\*\* .31 <.0001  
## 5 age.group:taste 2, 54 1.70 12.50 \*\*\* .32 <.0001  
## 6 gender:taste 1, 54 1.70 0.21 .004 .64  
## 7 age.group:gender:taste 2, 54 1.70 5.55 \*\* .17 .006  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '+' 0.1 ' ' 1