**Data Science HW7 Total: 20 points Due: February 22nd, 2019, NOON**

**Assignment Paper: Gino et al., 2015**

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

* Overall: Is inauthenticity related to feeling unclean, immoral, and/or impure?
* 1: Is inauthenticity in general connected to feeling impure?
* 2: Is inauthenticity related to cleaning behaviors?
* 3: Are the previous findings related to actually inauthenticity or just to recalling a negative event in general?
* 4: How does the presence of choice interact with the effects of inauthenticity?

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

* 1:
  + IV: behavior (authentic vs inauthentic), event (general vs unrelated to lying)
  + DV: moral self-regard, impurity, (also measured: self-alienation, word count, essay content)
* 2:
  + IV: behavior (authentic vs inauthentic), event (general vs unrelated to lying)
  + DV: appeal of cleansing products (as measured by word completion and desirability), appeal of cleansing behaviors, self-alienation (manipulation check)
* 3:
  + IV: condition (inauthenticity, failure, or control)
  + DV: impurity, cognitive dissonance, desire to help, also 2 manipulation checks were measured (self-alienation and essay content)
* 4:
  + IV: condition (high-choice, counterattitudinal; low-choice, counteratti- tudinal; or high-choice, proattitudinal)
  + DV: perceived choice, appeal of cleaning items, self-alienation (manipulation check)
    - also collected but not analyzed: age, gender, year

1. 3. R section (please complete the following and **include your script and outputs\*\*** as in-line text below)
   1. Reproduce **the power analyses conducted in Study 1 through 4** (they can all be found in the method section under “participants and design”) [6]
2. hw\_07
3. Abby Bergman
4. 2/20/2019
5. #"We calculated our target sample size using an estimated effect size, f, of 0.2, which would require a sample size of approximately 270 participants for the study to be powered at 90%."  
     
   pwr.anova.test(k= 2, n= , f= .2, sig.level= .05, power= .9)
6. ##   
   ## Balanced one-way analysis of variance power calculation   
   ##   
   ## k = 2  
   ## n = 132.3105  
   ## f = 0.2  
   ## sig.level = 0.05  
   ## power = 0.9  
   ##   
   ## NOTE: n is number in each group
7. #"We calculated our target sample size using an estimated effect size, f, of 0.1, which would require a sample size of 900 partici- pants for the study to be powered at 85%"  
     
     
   pwr.anova.test(k= 2, n= , f= .1, sig.level= .05, power= .85)
8. ##   
   ## Balanced one-way analysis of variance power calculation   
   ##   
   ## k = 2  
   ## n = 449.8818  
   ## f = 0.1  
   ## sig.level = 0.05  
   ## power = 0.85  
   ##   
   ## NOTE: n is number in each group
9. #"We calculated our target sample size using an estimated effect size, f, of 0.2, which would require a sample size of approximately 280 participants for the study to be powered at 85%"  
     
     
   pwr.anova.test(k= 3, n= , f= .2, sig.level= .05, power= .85)
10. ##   
    ## Balanced one-way analysis of variance power calculation   
    ##   
    ## k = 3  
    ## n = 92.03292  
    ## f = 0.2  
    ## sig.level = 0.05  
    ## power = 0.85  
    ##   
    ## NOTE: n is number in each group
11. #"We calculated our target sample size using an estimated effect size, f, of 0.15, which would require a sample size of approxi- mately 490 participants for the study to be powered at 85%."  
      
    pwr.anova.test(k= 3, n= , f= .15, sig.level= .05, power= .85)
12. ##   
    ## Balanced one-way analysis of variance power calculation   
    ##   
    ## k = 3  
    ## n = 162.8281  
    ## f = 0.15  
    ## sig.level = 0.05  
    ## power = 0.85  
    ##   
    ## NOTE: n is number in each group
13. *Challenge question***:** Power Analysis for Chi-Square Tests

Let’s assume that you’re looking at the relationship between ethnicity and promotion. You anticipate that 70% of your sample will be Caucasian, 10% will be African-American, and 20% will be Hispanic. Further, you believe that 60% of Caucasians tend to be promoted, compared with 30% for African-Americans and 50% for Hispanics.

* 1. Complete the following table. ***Cells should show proportions*** [2]
  2. What is the number of subjects needed to generate a significant level of 0.05, with desired power .90? (*include your R code, your output, and a conclusion!* see hints below*)* [4]

   

|  |  |  |
| --- | --- | --- |
| **Ethnicity** | **Promoted** | **Not promoted** |
| Caucasian .7 | .42 | .28 |
| African-American .1 | .03 | .07 |
| Hispanic .2 | .1 | .1 |

#Chi Squared  
pwr.chisq.test(w = 0.1853198, N= , df= 2, sig.level = .05, power= .9)

##   
## Chi squared power calculation   
##   
## w = 0.1853198  
## N = 368.4529  
## df = 2  
## sig.level = 0.05  
## power = 0.9  
##   
## NOTE: N is the number of observations

#N = 369 observations  
  
  
P = matrix( c(.42, .28, .03, .07, .1, .1), byrow = TRUE, nrow =3)  
ES.w2(P)

## [1] 0.1853198

df = (3-1)\*(2-1)  
df

## [1] 2

IN order to have a power of .9, you would need 369 observations.