DA 6823
Kilger
Module 3: Part #1 (20 points)

Statistical Significance Versus Effect Size + Independent Samples t test

General Instructions: In your own words, answer each of the following questions - don't copy (e.g. cut and paste) some definition out of a book word for word. This is not a group project – you are expected to complete this module on your own. You may refer to text books, online or other sources but not your fellow classmates. If you don't understand the question, feel free to ask the instructor in class, in office hours or in an email.

Here is the SAS printout for an independent samples ttest that compares advertising receptivity (scale =person has low ad receptivity, 5=person has high ad receptivity) between males (gender=1) and females (gender=0).

The SAS System

The TTEST Procedure

Variable: ad_receptivity (advertising receptivity)

gender	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	14454	3.1334	1.3887	0.0116	1.0000	5.0000
1	11110	2.9178	1.3841	0.0131	1.0000	5.0000
Diff (1-2)		0.2156	1.3867	0.0175		

gender	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		3.1334	3.1107	3.1560	1.3887	1.3728	1.4049
1		2.9178	2.8921	2.9436	1.3841	1.3661	1.4025
Diff (1-2)	Pooled	0.2156	0.1813	0.2499	1.3867	1.3748	1.3988
Diff (1-2)	Satterthwaite	0.2156	0.1813	0.2498			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	25562	12.32	<.0001
Satterthwaite	Unequal	23936	12.33	<.0001

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	14453	11109	1.01	0.7132

1. State the null and alternative hypotheses for the 2 independent sample t test. (4 points)
   H_{null} : Female receptivity = Male receptivity
   H_{alt} : Female receptivity ≠ Male receptivity

2. Name two assumptions of the 2 independent sample t test. (4 points)
   Female receptivity > Male receptivity
   Male receptivity > Female receptivity
   normal distribution, dependent variable = interval or better

3. What is the mean ad receptivity for males? For females? (2 points)
   Males: 2.9178
   Females: 3.1334

4. Does the data suggest that the variance of ad receptivity in males versus females is to be treated as equal or unequal? What is the p value for this test? (4 points)
   Since the p value > 0.7132, males and females should be treated equally.

5. What can you conclude about the differences in ad receptivity between males and females? Given the differences in the data between males and females, explain why you were able to come to the conclusion that you did. (6 points)
   With the pooled method and the probability ≤ 0.05 we will reject the null hypothesis and acknowledge that there is a difference between male receptivity and female receptivity.