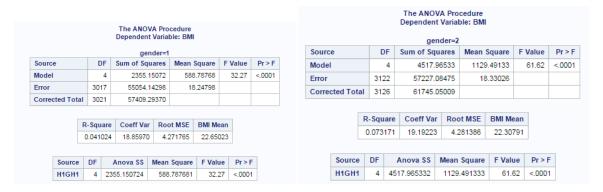
Data analysis tools Week 4 assignment Work with moderation

I chose addhealth as my data set.

I want to find out if gender matters in the health situation. Three different analysis were conducted with **gender as moderator**:

- 1. ANOVA: general health and BMI.
- 2. how close with mother and how close with father.
- 3. frequency of feeling happy and BMI.

1. ANOVA



The results show that no matter the respondents are male or female, the means of BMI at different levels of general health are not all equal to each other. While the F-value for male is 32.27 and for female is 61.62, which means **gender does moderate the relationship.**

Because there are more than 2 levels of general health, post hoc test was conducted.

The ANOVA Procedure Duncan's Multiple Range Test for BMI							The ANOVA Procedure Duncan's Multiple Range Test for BMI						
gender=1							gender=2						
s test control	s the Type I comp	artsonwis	е епогл	ate, not t	ne experti	nentwise error rate.	Note: This test	t contro	is the Type I compa	risonwis	е епогл	ate, not t	he experin
	Alpha	Alpha		0.	05				Alpha			0.	05
	Error Degrees	Error Degrees of Freedom		30	17				Error Degrees	of Free	iom	31	22
	Error Mean Sq	Error Mean Square		18.247	98		E		Error Mean Sq	Error Mean Square		18.330	26
	Harmonic Mean of Cell Sizes		45,366	58		Harmonic Mean of Cell Si		Sizes	59.115	51			
M	Note: Cell sizes are not equal.							B.	Note: Cel				5
Ni	umber of Means	2	3	4	5			N	umber of Means	2	3	4	5
Cr	Itical Range	1.759	1.852	1.914	1.960			C	ritical Range	1.544	1.626	1.680	1.721
Mean	eans with the same letter are not significantly different.							Mear	Means with the same letter are not sig			nificanti	y different
Dui	ncan Grouping	1	Mean		H1GH1			Du	incan Grouping		Mean	N	H1GH1
	A	26.	.9031	10	5				A	25	8565	13	5
									A				
	В	24.	9657	146	4				A	25	6244	227	4
	В												
С	В	23.	.6934	651	3				В	23	1309	849	3
С									В				
С		22	4245	1229	2			С	В	21	8089	1255	2
С								С					
_					1								

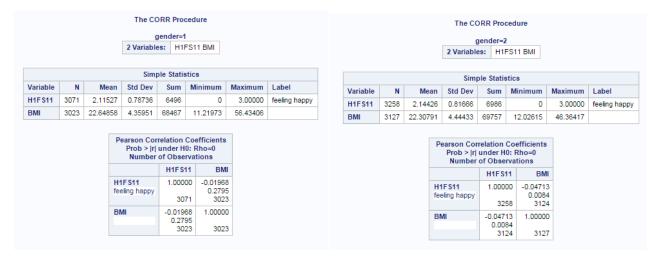
We can see for male, level 1 and level 2 are similar to each other, in addition to this, all other pairs are different from each other. While for female, level 5 is similar to level 4, other pairs are different from each other. This further illustrate that **gender moderates their relationship**.

2. Chi square.

Statistics for Table of	mothe	er by fathe	r	Statistics for Table of mother by father						
Statistic	DF	Value	Prob	Statistic		Value	Prob			
Chi-Square	1	65.2504	<.0001	Chi-Square	1	70.7614	<.000			
Likelihood Ratio Chi-Square	1	61.6716	<.0001	Likelihood Ratio Chi-Square	1	71.5040	<.000			
Continuity Adj. Chi-Square	1	63.6273	<.0001	Continuity Adj. Chi-Square	1	69.5008	<.000			
Mantel-Haenszel Chi-Square	1	65.1427	<.0001	Mantel-Haenszel Chi-Square	1	70.6673	<.000			
Phi Coefficient		0.3281		Phi Coefficient		0.3068				
Contingency Coefficient		0.3118		Contingency Coefficient		0.2933				
Cramer's V		0.3281		Cramer's V		0.3068				

The results show that the p-values for both genders are less than 0.05. At 95% confidence level, we can say there is significant relationship between these two variables. The values for both gender does not differ from each other a lot, which mean the **gender may have no effect on their relationship.**

3. Correlation.



The results show that for male (gender = 1), the p-value is larger than 0.05, while for female(gender = 2), it is less than 0.05, which means for male, there feeling happy and BMI are not correlated, while for female they are correlated. The different correlation shows **gender does moderate their relationship.**

My code:

```
1/*load data*/
 2 LIBNAME mydata "/courses/d1406ae5ba27fe300" access=readonly;
 3 data new; set mydata.addhealth pds;
 5/*select respondents from grade 7 to grade 12*/
 6 if H1GI20=97 then delete; if H1GI20=99 then delete; if H1GI20=96 then delete;
 7 if H1GI20=98 then delete;
 9/*set aside the missing values*/
10 if H1GH1=6 then H1GH1=.; if H1GH1=8 then H1GH1=.;
11 if H1GH59A=96 then H1GH59A=.; if H1GH59A=98 then H1GH59A=.; if H1GH59A=99 then H1GH
12 if H1GH59B=96 then H1GH59B=.; if H1GH59B=98 then H1GH59B=.; if H1GH59B=99 then H1GH
13 if H1GH60=996 then H1GH60=.; if H1GH60=998 then H1GH60=.; if H1GH60=999 then H1GH60
14 if H1FS11=6 then H1FS11=.; if H1FS11=8 then H1FS11=.;
15 if H1WP9=6 then H1WP9=.; if H1WP9=7 then H1WP9=.;
16 if H1WP9=8 then H1WP9=.; if H1WP9=9 then H1WP9=.;
17 if H1WP13=6 then H1WP13=.; if H1WP13=7 then H1WP13=.;
18 if H1WP13=8 then H1WP13=.; if H1WP13=9 then H1WP13=.;
20 /*calculate the height*/
21 H1GH59=H1GH59A * 12 + H1GH59B;
```

```
23 /*calculate the body mass index*/
24 BMI=H1GH60 * 0.454/(H1GH59 * 0.0254)**2;
25
26/*add labels*/
27 label AID="respondent ID"
        BIO SEX="gender"
28
       H1GH1="general health"
29
       H1GH59A="height in feet"
30
       H1GH59B="height in inch"
31
       H1GH60="weigt (pound)"
32
       H1FS11="feeling happy"
33
34
       H1WP9="how close with mother"
35
       H1WP13="how close with father"
36
       H1GH59="height (inch)";
37
38 / *ANOVA*/
39 data anovadata; set new;
40 proc sort; by BIO_SEX;
41 proc anova; class H1GH1;
42 model BMI=H1GH1;
43 means H1GH1; by BIO_SEX;
44 run;
45
46/*chi square*/
47 data chidata; set new;
48 proc sort; by BIO SEX;
49 proc freq; tables H1WP9*H1WP13/chisq; by BIO_SEX;
50 run;
51
52 /*correlation*/
53 data corrdata; set new;
54 proc sort; by BIO_SEX;
55 proc corr; var H1FS11 BMI; by BIO SEX;
56 run;
```