Data Analysis III: Correlation Analysis (Excel)

1) This task requires you to 1) transform data according to your needs and 2) conduct two correlation analyses of your choices.
2) **How?** Open your Excel file.

Step 1 Know all the psychometric constructs included in the data set. In the data set, we measured three major psychological constructs related to motivation – expectancy, value and cost. These constructs are defined below:

Expectancy: how probable the outcome is achieved through the behavior or action.

Value: how much the individual values the desired outcome.

Cost: required effort, lost alternative opportunities, and negative affect associated with action

Under some of the major construct, there are sub-constructs. For instance, the three sub-constructs of costs are social costs, loss of valuable alternatives, and physical costs. For values, the sub-constructs are attainment value, intrinsic value and utilitarian value. A list of survey questions that tap into the constructs are listed below.

Sub-constructs	Survey Questions
Social Costs	
Social cost 1	I am not happy in PE when I receive negative comments or feedback from the teacher.
Social cost 2	I am not happy in PE because other students tease/laugh at me.
Social cost 3	I am not happy in PE because teachers are not caring and do not communicate with me.
Social cost 4	I am not happy in PE because teachers only pay attention to the students with the most skills.
Social cost 5	I am not happy in PE because teachers do not hold students accountable for their misbehaviors (i.e., for breaking the rules).
Social cost 6	I give less than my best effort in PE because I am working with someone I do not like to work with.
Costs as Loss of Valuable Alternative	
Loss of valuable alternative 1	Participating in PE will make me tired and I can lose concentration in other classes.
Loss of valuable alternative 2	Exercising in PE will take away the time that I want to spend on socializing with my friends.
Loss of valuable alternative 3	Exercising in PE will take away the time that I want to spend on relaxing myself.
Loss of valuable alternative 4	Participating in PE will make me tired and take away my time for entertainment.
Loss of valuable alternative 5	Participating in PE will make me tired and take away my energy for other extracurricular activities (extracurricular sports, band, book club, etc.).
Physical Costs	
Physical cost 1	I do not work hard in PE because sweating is not comfortable.

Physical cost 2	I do not work hard in PE because participating messes up my appearance (e.g. hairs, clothes, etc.).
Physical cost 3	I do not work hard in PE because I get out of breath.
Physical cost 4	I do not work hard in PE because it makes my heart beat too fast.
Physical cost 5	I do not work hard in PE because it makes me feel hot.
Expectancy	
Expectancy 1	How good are you in physical education?
Expectancy 2	If you give 5 to the best student in PE and 1 to the worst, what you give to yourself?
Expectancy 3	Some kids are better in one subject than in another. For example, you might be better in math than in reading. Compared to most of your other school subjects, how are you doing in PE?
Expectancy 4	How well do you think you are in PE?
Expectancy 5	How well are you keeping yourself physically active in PE?
Attainment Values	
Attainment value 1	How important do you think PE is for you?
Attainment value 2	Compare to math, reading, and science, how important is it for you to learn PE content?
Intrinsic Values	
Intrinsic value 1	In general, how fun do you think your PE classes are?
Intrinsic value 2	How much do you like your PE classes?
Utilitarian Values	
Utilitarian value 1	Some things that you learn in school help you do things better outside of school. We call this being useful. For example, learning about plants at school might help you grow a garden at home. How useful do you think the contents you learned in PE are?
Utilitarian value 2	Compared to your other school subjects, how useful are the skills learned in PE?

Step 2: Transform the data based on your interests. Here I am interested in 1) the correlation between *knowledge test results* and the students' perception of *physical costs*; 2) the correlation between students' perception of *physical costs* and their perception of *intrinsic values*.

To do so, I need to first create a variable to represent the accumulated effect of all items that measure physical costs. Right click the variable listed right after the last physical cost item (Physical Cost 5) and click "insert" a new blank variable will be inserted after Physical Cost 5. Then I will rename the variable as "Physical Cost Total." In the cell right below the variable name, I enter "=SUM(AL2:AP2)" to make sure the new variable is the sum of Physical Cost 1 all the way to Physical Cost 5. Then I put the mouse on the lower right corner of the sell until a small "+" sign shows up. I then drag the "+" sign down to the bottom of the data set. So, the calculation for the new "Physical Cost Total" is finished.

I then repeat the same procedure to create a new variable "Intrinsic Value Total" to represent the two survey questions that measure Intrinsic Values. In the end, all three variables that I am interested in "knowledge test total" "Physical Cost Total" and "Intrinsic Value Total" will be copied to a new Excel sheet for easy maneuver. When you paste the variables into the new Excel sheet, make sure you choose the Paste Option with Values (v).
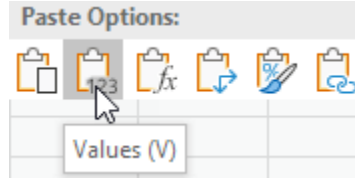
Step 3: Install "Data Analysis" add-in. If you can't find a tab called "Data Analysis" under "Data" you need to install it. First you go to "File" and click "Options." In the window popped up, click "Add-ins" on the left hand side. At the bottom of the new window, you click "go" after "Excel Add-Ins" After check "Analysis ToolPak" you click "Go."

Step 4: Analysis of Correlation

I then choose a blank cell on the new Excel sheet "=CORREL(A2:A416, B2:B416)." CORREL is the Excel function to calculate correlation. A2:A416 is to tell Excel the first variable in the correlation analysis (the beginning and the end of the data you designated). B2:B416 is to tell Excel the second variable in the correlation analysis. So, you enter "=CORREL(C2:C416, B2:B416)" you are calculation the correlation between B and C variables.

You are expected to conduct two correlation analyses of your choices. Send me your Excel file for calculation and the brief write-up that explains your results.

Step 5: Write up your results according to the results generated by Excel. The write up should be similar to the passage below after you plug in the numbers.

"Pearson correlation analysis indicates that *knowledge test results* and *physical costs* were found to be non correlated, $r(416) = .07$. However, Pearson correlation analysis shows a medium but negative correlation between students' perceived *intrinsic value* and their perception of *physical costs* $r(416) = -0.41$."

The following chart explains the strength of correlation coefficient *r*. The following page shows the visualization of different correlation co-efficients.
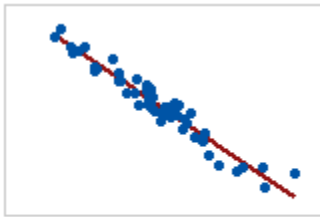
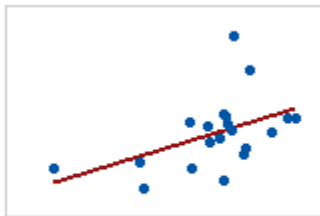|	Coefficient, *r*	
Strength of Association	Positive	Negative
Small	.1 to .3	-0.1 to -0.3
Medium	.3 to .5	-0.3 to -0.5
Large	.5 to 1.0	-0.5 to -1.0
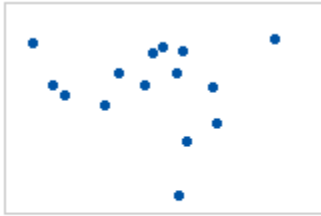
No relationship: Pearson r = 0
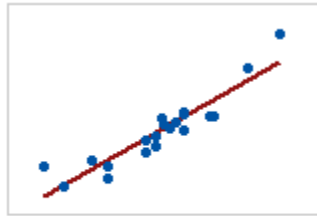
Large positive relationship: Pearson r = 0.93

Large negative relationship: Pearson r = −0.968

Moderate positive relationship: Pearson r = 0.476