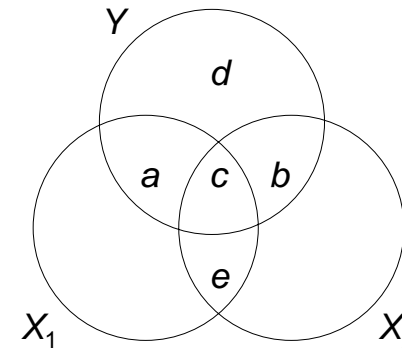


Week of March 23

1. Partial correlations
2. Semipartial correlations
3. Moderated multiple regression

Venn Diagram: Partial and Semipartial Correlations



Partial Correlation

- Definition: The correlation between two variables after all variance associated with a control variable (or set of controls) has been removed from **both** the predictor and the criterion

$$- r_{Y1.2}^2 = \frac{a}{a+d} = \frac{R_{Y.12}^2 - R_{Y.2}^2}{1 - R_{Y.2}^2}$$

$$- F(1, N - k_{12} - 1) = \frac{(R_{Y.12}^2 - R_{Y.2}^2) / (k_{12} - k_2)}{(1 - R_{Y.12}^2) / (N - k_{12} - 1)}$$

Semipartial Correlation

- Definition: The correlation between two variables after all variance associated with a control variable (or set of controls) has been removed from **only** the criterion

$$- r_{Y(1.2)}^2 = \frac{a}{a+b+c+d} = R_{Y.12}^2 - R_{Y.2}^2$$

$$- F(1, N - k_{12} - 1) = \frac{(R_{Y.12}^2 - R_{Y.2}^2) / (k_{12} - k_2)}{(1 - R_{Y.12}^2) / (N - k_{12} - 1)}$$

Partial and Semipartial Correlations: Using SPSS

- For partial correlations, use Correlations → Partial
- For semipartial correlations, use Regression → Linear to conduct a hierarchical regression analysis
 1. Define the criterion as the Dependent
 2. In a first step, enter the control(s)
 3. In a second step, enter the predictor
 4. The semipartial correlation is the change in R^2 from model 1 to model 2

Moderation

- Moderation exists if the relationship between a predictor and the criterion depends on the value of another predictor (i.e., there's an interaction between the predictors)
 - Another way to say this is that the slope of the regression line predicting the criterion from the predictor differs across values of the moderator
 - Statistically, it's arbitrary as to which variable is the predictor and which is the moderator

Testing for Moderation

- First, use Transform → Compute to create an interaction term by multiplying the predictor with the suspected moderator
- Second, conduct a hierarchical regression analysis to test for significant moderation
 1. Define the criterion as the Dependent
 2. In a first step, enter the predictor and the suspected moderator
 3. In a second step, enter the interaction term
 4. If there is a significant gain in R^2 from model 1 to model 2, then you have good evidence of a moderation effect

Moderation: Implications for Prediction

- If there is a significant moderation effect, you should either...
 - Make predictions for different groups from different regression equations, or...
 - Make predictions from a single regression equation that includes the interaction term