**Test your understanding of Mediation**

Mediation analysis with PROCESS

1. Which of the following is a mediational hypothesis?

a. Witnessing domestic violence directly affects a child’s emotional development.

b. The effect of domestic violence on emotional development is explained by its effects on a child’s neurological stress response.

c. Domestic violence and children’s emotional development are correlated.

d. Children who experience domestic violence are more likely than others to have emotional disorders.

2. Mediation can also be referred to as:

a. the significant effect of an independent variable on a dependent variable

b. a non-causal relationship

c. an unstandardized regression coefficient with an unexpected sign

d. the indirect effect of one variable on another

3. Which of the following is true about testing mediation models with multiple regression:

a. Only three variables can be in the analysis.

b. Mediation effects can be detected with hierarchical regression.

c. There can be two dependent variables in the same regression model

d. a and b

4. How do researchers determine if a mediation effect is statistically significant:

a. They look at the statistical significance of the independent variable’s regression coefficient.

b. They look at the statistical significance of the mediator variable’s regression coefficient.

c. The usual regression output does not include information on the significance of the mediation effect.

d. It’s obvious from looking at the magnitude of the regression coefficients.

5. Full mediation is indicated when the following conditions occur:

a. The mediator has a statistically significant effect on the dependent variable when it (the mediator) is added to the model.

b. The independent variable *had* a statistically significant effect on the dependent variable *before* the mediator was added to the model.

c. The independent variable does *not* have a significant effect on the dependent variable when the mediator is added to the model.

d. All of the three previous conditions have to occur.

6. Full mediation means:

a. All of the effect of the independent variable on the dependent variable is explained by its effect on the mediator.

b. When they are in the same regression model, both the mediator and the independent variable have statistically significant effects on the dependent variable.

c. Neither the independent variable nor the mediator are related to the dependent variable.

d. The magnitude of the independent variable’s coefficient gets bigger when the mediator is added to the model.

7. A researcher would conclude there is no mediation effect if:

a. The coefficient for the independent variable gets smaller but remains statistically significant when the mediator is added

b. The coefficient for the independent variable does not change and remains statistically significant when the mediator is added

c. The coefficient for the independent variable gets smaller and becomes nonsignificant when the mediator is added

d. It is a silly question because researchers always find mediation effects.

8. Mediation analyses can be important in social work research because:

a. Most developmental processes are simple.

b. They can explain how outcome variables predict developmental processes.

c. They can explain *how* social environmental factors affect developmental processes.

d. They prove that the social environment is unimportant to developmental processes.

9. Hierarchical regression is useful for mediation tests because:

a. The mediator can be added in a separate block to an earlier model containing the independent variable.

b. It allows us to compare the effects of the independent variable with and without the mediator in the model.

c. We can control for the effects of demographic variables before examining effects of the independent variable and mediator.

d. All of the above

10. Mediation analyses can be important in social work research because:

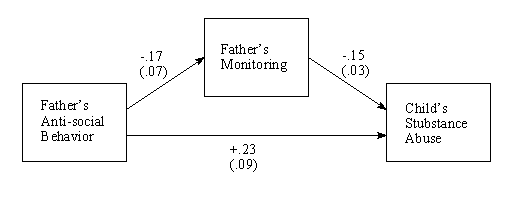
a. They can indicate *how* an intervention improves outcomes.

b. They always have statistically significant coefficients.

c. Independent variables never have direct effects on dependent variables

d. All of the above

11. Here is a mediation path diagram with parameter estimates (and standard errors in parentheses).  
 



a. Label the diagram a, b and c’. Compute the indirect effect and the total effect?  
b. Write the two equations that were used to obtain the estimates in the model above.  
c. Calculate the proportion mediated and the ratio of the mediated to the nonmediated effect.

12. Use the dataset called Waves 1 and 3 merged.sav. This is the AddHealth survey data that I used in two papers I wrote Elise Barboza, G., & Siller, L. A. (2021). Child maltreatment, school bonds, and adult violence: a serial mediation model. *Journal of interpersonal violence*, *36*(11-12), NP5839-NP5873 and Barboza, G. E. (2020). Child maltreatment, delinquent behavior, and school factors as predictors of depressive symptoms from adolescence to adulthood: A growth mixture model. *Youth & society*, *52*(1), 27-54. This gives you a sense of the data and variables in case you are not familiar with the AddHealth Survey.

Run one mediation model that tests the following hypotheses: (1) student suspensions lower academic achievement (direct effect); and (2) the mechanism by which suspension impacts student academic achievement is through its effect on reducing self-esteem, that is, students who are suspended have lower levels of self-esteem which reduces their academic achievement (indirect effect).

Use the variables as follows

* *Suspend* – dummy variable coding the effect of having received in out-of-school suspension in Wave 1
* *esteem3r* – a scale comprised of typical self-esteem variables, higher values mean more self-esteem (Wave 3)
* *grades* – a scale based on GPA for several courses, higher values mean *worse* grades so be careful with your interpretations (Wave 3)

1. Draw the mediation diagram
2. Write the two equations that were used to obtain the estimates
3. Interpret the effects
4. State one to two policy conclusions based on these results
5. Add the dummy coding the effect of being Non-Hispanic White and Parental education as covariates; re-run model and interpret results
6. Re-run the model separately for males and females. Note any differences. Does the mechanism by which suspension affects academic achievement work similarly across gender? Why/Why not?