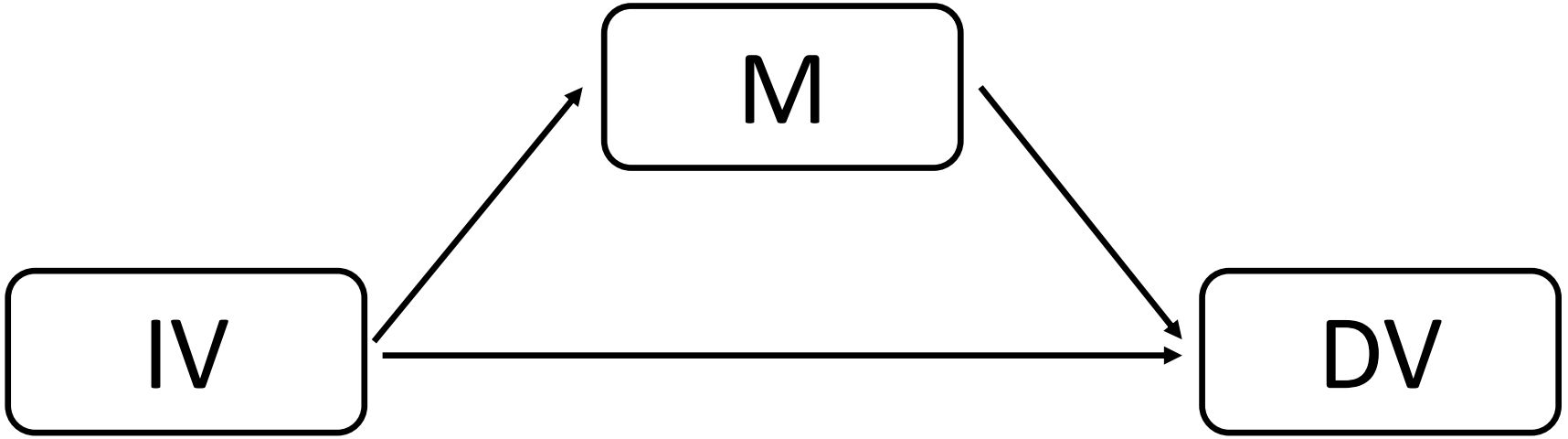
# Mediation Analysis in SPSS for Binary Outcome




# Notes: The author accepts no responsibility for the topicality, correctness, completeness or quality of the information provided.

# # Notes

- 1. The author accepts no responsibility for the topicality, correctness, completeness, or quality of the information provided.

- 2. This pdf is part of a YouTube tutorial: https://youtu.be/bpaQ96Euafg

- 3. This pdf is for your own personal use only. Please do not distribute further!

# Notes: The author accepts no responsibility for the topicality, correctness, completeness or quality of the information provided.

# Often,
# we use first partial derivatives to model indirect effects.

**(Reference is provided in the video description.)**

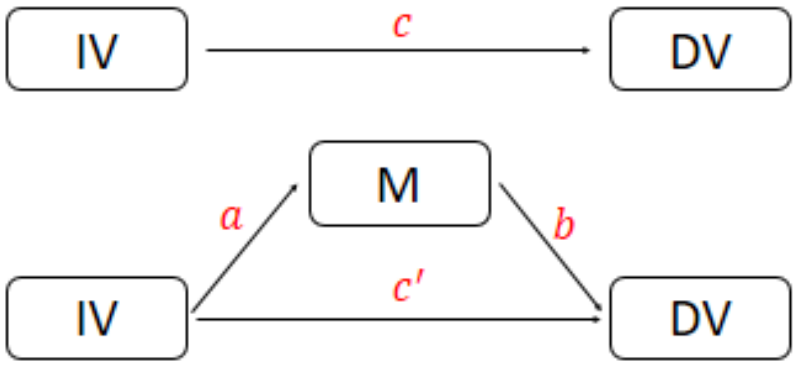
# Mediation Analysis for Continuous Outcome

# Notes: The author accepts no responsibility for the topicality, correctness, completeness or quality of the information provided.

# Mediation Analysis for Continuous Outcome

## Sample Data:

- X (IV) is continuous.
- M is continuous.
- Y (DV) is continuous.




## a and b paths:

- (1) X → M (a path)
- (3) X + M → Y (b path)

- $M = a_0 + a_1 X$ $\quad \frac{\partial M}{\partial X} = a_1$
- $Y = b_0 + b_1 M + c' X$ $\quad \frac{\partial Y}{\partial M} = b_1$

**Indirect effect:** $a_1 * b_1$

# Notes: The author accepts no responsibility for the topicality, correctness, completeness or quality of the information provided.

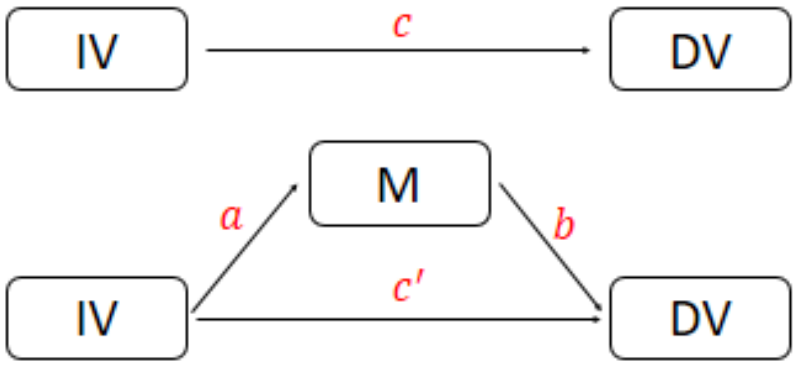
# Mediation Analysis for Binary Outcome

# Notes: The author accepts no responsibility for the topicality, correctness, completeness or quality of the information provided.

# Mediation Analysis for Binary Outcome

## Sample Data:

- X (IV) is continuous.
- M is continuous.
- Y (DV) is binary.




## a and b paths:

- (1) X → M (a path)

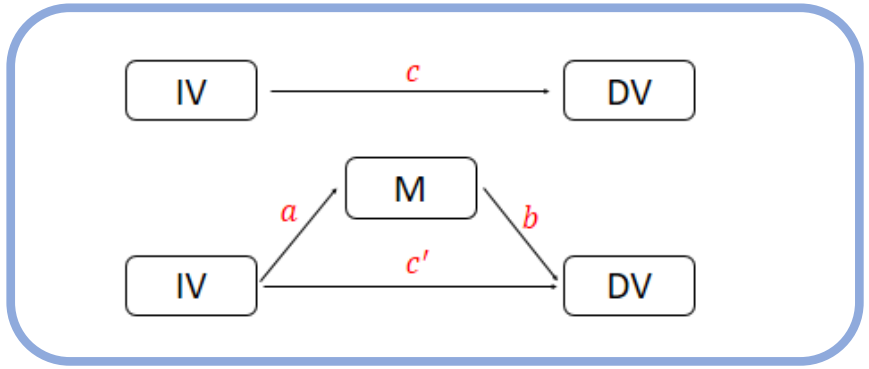
$$M = a_0 + a_1 X$$

$$\frac{\partial M}{\partial X} = a_1$$

- (3) X + M → Y (b path)

$$P(Y=1) = \frac{e^{(b_0 + b_1 M + c' X)}}{1 + e^{(b_0 + b_1 M + c' X)}}$$

# Notes: The author accepts no responsibility for the topicality, correctness, completeness or quality of the information provided.




## Logistic Function (or, expit) Format

$$P(\text{Y=1}) = \frac{e^{(b_0+b_1M+c'X)}}{1+e^{(b_0+b_1M+c'X)}}$$

$$\frac{\partial\, P(Y=1)}{\partial\, M} = \frac{b_1 e^{(b_0+b_1M+c'X)}}{(1+e^{(b_0+b_1M+c'X)})^2}$$

## Log odds (or, logit) Format

$$\log\frac{P(\text{Y=1})}{1-P(\text{Y=1})} = b_0 + b_1M + c'X$$

$$\frac{\partial \log\frac{P(\text{Y=1})}{1-P(\text{Y=1})}}{\partial\, M} = b_1$$

**PROCESS in SPSS calculates the indirect effect: $a_1 * b_1$**

# Notes: The author accepts no responsibility for the topicality, correctness, completeness or quality of the information provided.