Total Effect and Indirect Effect
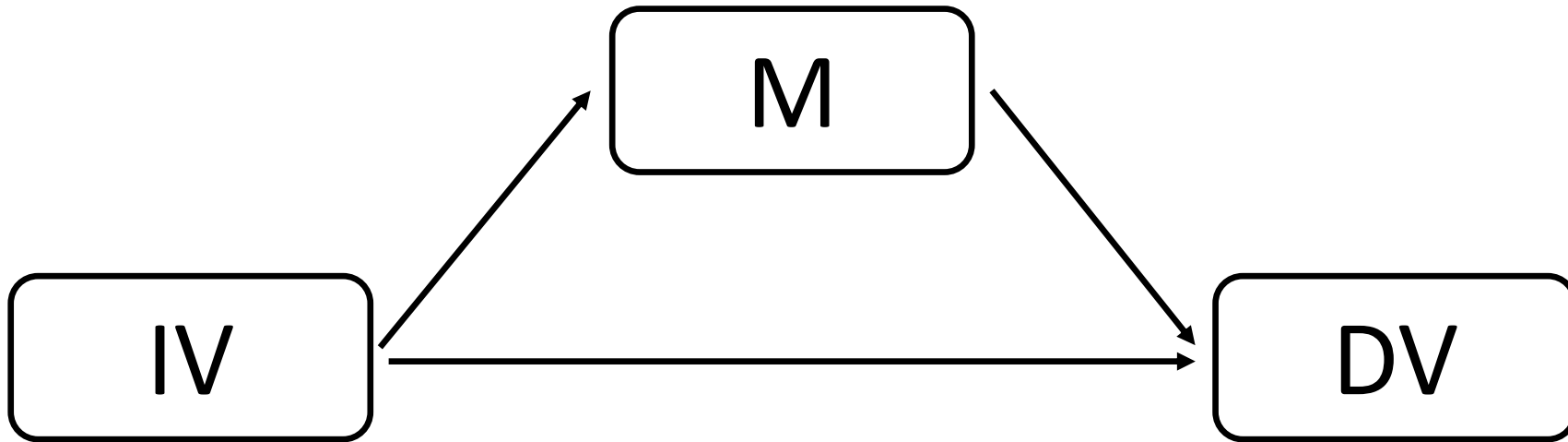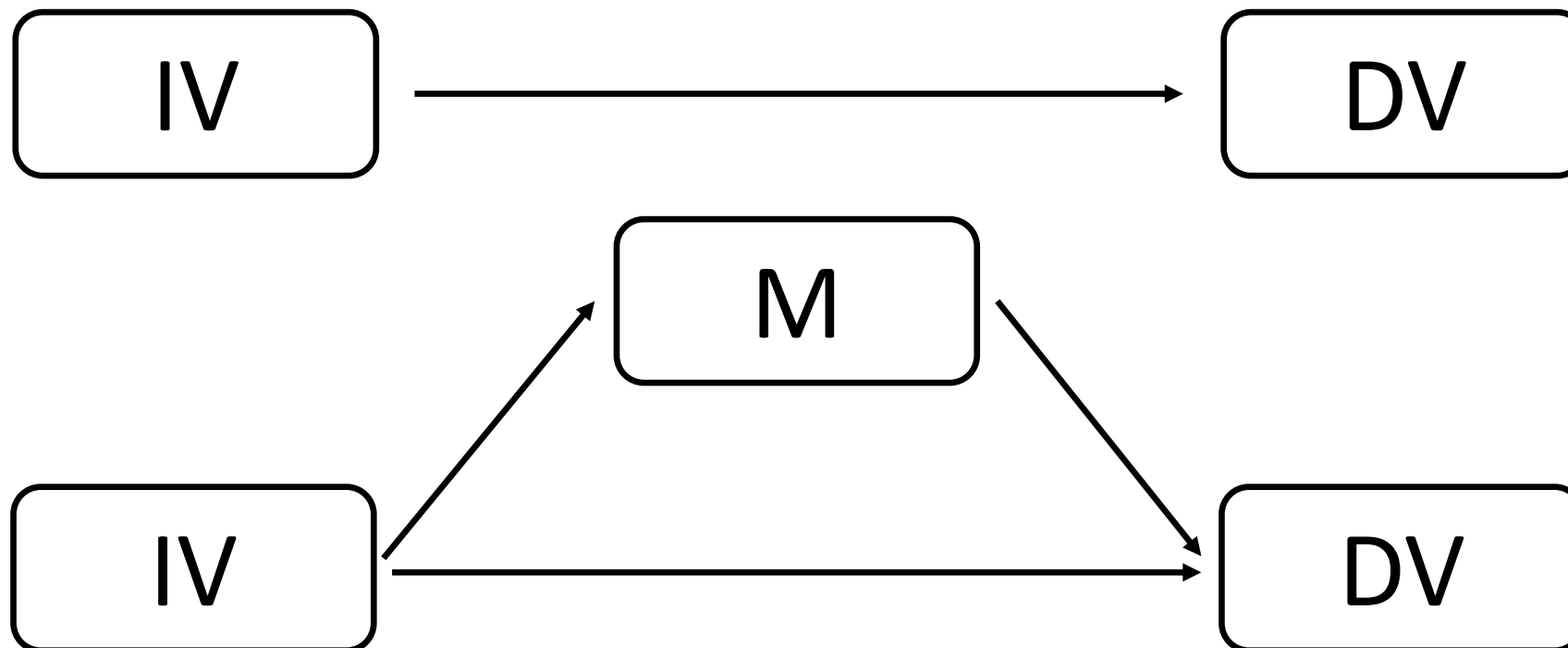
Basic Idea of Mediation

- An observed relationship between an independent variable (IV, or X) and a dependent variable (DV, or Y).
- Mediator (M): Trying to explain that observed relationship.

Conditions of Mediation

- Based on Baron & Kenny (1986), there are three sets of regression:
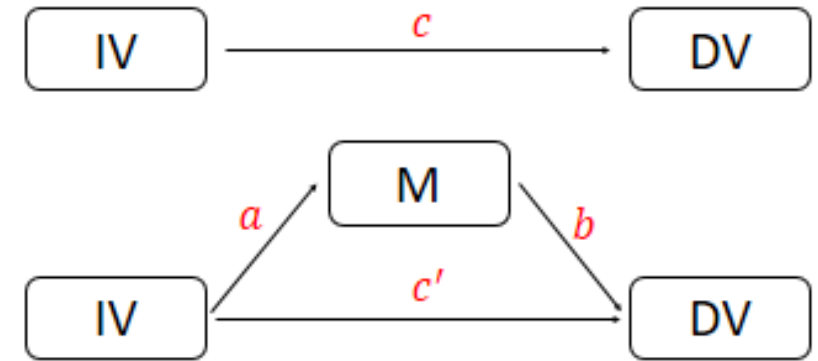- (1) X → Y (c needs to be significant, generally speaking.)

$$Y = cX$$

- (2) X → M (a needs to be significant.)

$$M = a\,X$$

- (3) X + M → Y (b needs to be significant.)

$$Y = c'X + b\,M$$

total effect = direct effect + indirect effect

$$c = c' + ab$$

Hypothetical Data

- Note: This data is generated via R programming (i.e., not real data). Please do not interpret the findings from a theoretical perspective.

- IV = Temperature

- DV = Sales

- Mediator = Need for Frozen Desserts (NFD)
  - How much do you want to have frozen desserts?
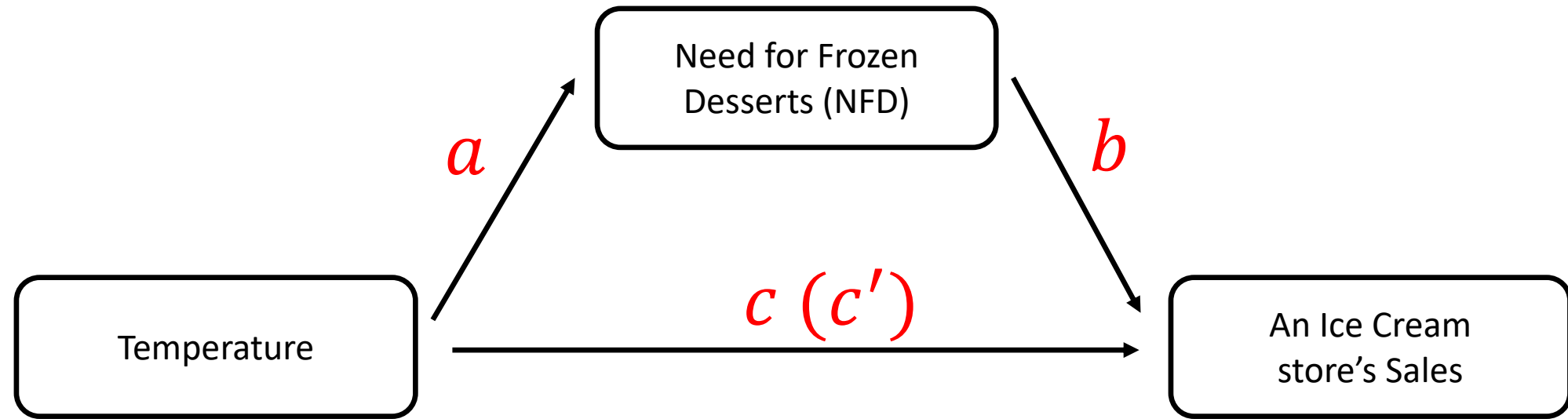 - 0 = Not at all, 6 = Very much

Example of Mediation

- The following is <mark>a hypothetical study</mark>.
  - Higher temperatures increase an ice cream store's sales.
  - This is because higher temperatures make people want to have frozen desserts, making them more likely to buy ice cream from the store
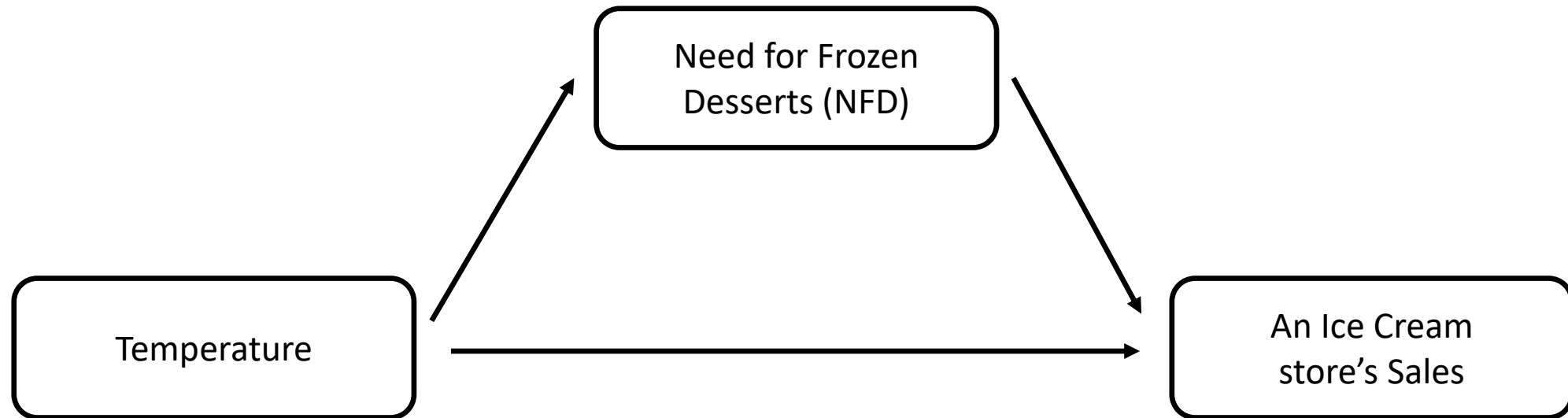
Total Effect
- (1) X → Y

$$Y = cX$$

$$\text{Sales} = b_0 + c\ \text{Temperature}$$

Indirect Effect:
- (2) X → M (a needs to be significant.)

$$M = a\ X$$

$$\text{NFD} = b_0 + a\ \text{Temperature}$$

- (3) X + M → Y (b needs to be significant.)

$$Y = c'X + b\ M$$

$$\text{Sales} = b_0 + c'\text{Temperature} + b\ \text{NFD}$$