Handout #23: Mediation Part 1

1. Context: Causal modeling

2. Directed Acyclic Graphs:

$$X \rightarrow Y$$

   means that changes in X *cause* changes in Y but only in a stochastic way. It in no way implies that X is the only thing that can change Y or that X completely explains (predicts) Y.

3. If M "mediates" $X \rightarrow Y$. that means that some intermediate concept (variable) explains, in a causal way, *how* X affects Y.

4. Breakout

5. Standard DAGs

6. Standard equation: c = ab + c' or ab = c - c'

7. Statistical methods of determining mediation

   (a) Causal steps strategy

   (b) Difference in coefficients (c-c') strategy

   (c) Product of coefficients (ab) strategy

      i. Sobel test: $SE_{ab} = \sqrt{b^2 s_a^2 + a^2 s_b^2 + s_a^2 s_b^2}$
      ii. Sobel test is non-normal (and wrong) unless sample size is large
      iii. Bootstrap methods are commonly used instead