

- The plan for today
 - Discussion of the homework assignment
 - Exercise 3
 - Variables and causal explanations
 - Homework exercise 5
 - How do we evaluate causal claims?
 - Group work: exercises on the 4 hurdles

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Defining key concepts

- Variable
 - = a concept of interest
 - Independent variable v. dependent variable
- Theory
 - = a tentative conjecture about the causes of some phenomenon of interest
- Hypothesis
 - = a theory-based statement about a relationship that we expect to observe

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- Thinking about the world in terms of theoretical models vs. “just learning the facts”
 - What is the problem with “just learning the facts”?

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The road to scientific knowledge

- Causal theory
 - → hypothesis
 - → empirical test
 - → evaluation of the hypothesis
 - → evaluation of the theory
 - → scientific knowledge
- Skepticism
 - Q: Do lawyers and scientists differ in the way they approach evidence? If yes, how?
- Paradigm
 - Can one *confirm* a theory?

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Variables and causal explanations

- Fill in variables:
_____ causes _____
- Fill in variable values:
 - higher _____ causes higher _____
 - (or: higher _____ causes lower _____)

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Variables and causal explanations

- Fill in variables:
ethnic diversity causes civil war
- Fill in variable values:
 - higher ethnic diversity causes higher likelihood of civil war
 - (or: higher _____ causes lower _____)

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Variables and causal explanations

- Fill in variables:
global warming causes migration
- Fill in variable values:
 - higher average temperature causes higher migration
 - (or: higher _____ causes lower _____)
- Homework, exercise 5

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For Exercises 5 and 6, consider the following statement about the world: “If you care about economic success in a country, you should also care about the peoples’ political rights in that country. In a society in which people have more political rights, the victims of corrupt business practices will work through the system to get things corrected. As a result, countries in which people have more political rights will have less corruption. In countries in which there is less corruption, there will be more economic investment and more economic success.”

5. Identify at least two causal claims that have been made in the preceding statement. For each causal claim, identify which variable is the independent variable and which variable is the dependent variable. These causal claims should be stated in terms of one of the following types of phrases in which the first blank should be filled by the independent variable and the second blank should be filled by the dependent variable:

_____ causes _____

higher _____ causes lower _____

higher _____ causes higher _____

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Two meanings of causality

- 1) Deterministic causality
- 2) Probabilistic causality

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Evaluating causal relationships:
Four hurdles on the way to
establishing causal relationships



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Four hurdles on the way to establishing causal relationships

1. Is there a credible causal *mechanism* that connects X to Y
2. Could Y cause X?
3. Is there covariation between X and Y?
4. Is there some confounding variable Z that is related to both X and Y and that makes the observed association between X and Y spurious?

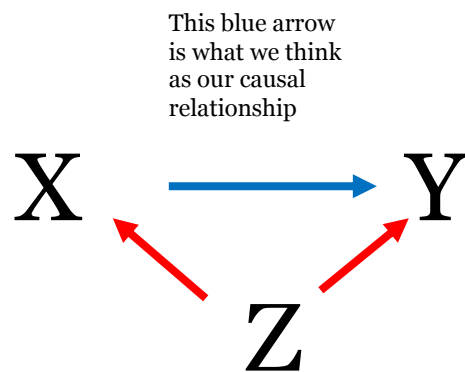
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Getting over the four hurdles

- Do you remember any examples in which the four hurdles were not satisfactorily cleared?
- What is a selection effect?
 - When a Z variable causes bias in the data
 - Example: examining the effects of a school-choice program
 - Some variable Z causes only a nonrandom subset of eligible pupils to participate in the school-choice program

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The effect of a confounding variable



However, if there is a confounding variable, we realize the blue arrow doesn't exist and there are only the red arrows. The relationship between X and Y *looks like* a causal relationship but X *does not cause* Y. Confounding variable Z is at the root of covariation between X and Y (that is, it's Z's fault that it looks like X causes Y).

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Practicing clearing the four hurdles

- Work in groups of 2-3
 - Does Facebook make us unhappy?
 - Write down your answers
 - Be prepared to share your answers with the class

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