

Extra Practice Problems
Discussion Section 1, Lectures 1-3

The following practice problems are designed to help you learn to identify course concepts from the first three lectures and the first discussion section.

Identifying Independent and Dependent Variables

News articles, just like research articles, often explore causal relationships. In the following news headlines, identify the independent and dependent variables, as well as examples of what values those variables could take on. As a bonus, try explaining the causal mechanism if you can—Reading the articles should reveal the answer to you. You could also try to think of possible confounds.

1. “Trump makes fewer public trips than recent presidents. Will that hurt the Republicans in November?” *The Monkey Cage* January 17, 2018. https://www.washingtonpost.com/news/monkey-cage/wp/2018/01/17/trump-makes-fewer-public-trips-than-recent-presidents-will-that-hurt-the-republicans-in-november/?utm_term=.273354e990a2
 - a. Independent Variable(s):
 - i. Values:
 - b. Dependent Variable(s):
 - i. Values:
 - c. Possible Confounds:
2. “Do lawmakers respond to immigrants’ requests? The answer depends on ethnicity and race.” *The Monkey Cage* January 16, 2018. https://www.washingtonpost.com/news/monkey-cage/wp/2018/01/16/do-lawmakers-respond-to-immigrants-requests-the-answer-depends-on-ethnicity-and-race/?utm_term=.21dfdc208a7b
 - a. Independent Variable(s):
 - i. Values:
 - b. Dependent Variable(s):
 - i. Values:
 - c. Possible Confounds:
3. “Repeated Head Hits, Not Just Concussions, May Lead To A Type Of Chronic Brain Damage” *NPR* <https://www.npr.org/sections/health-shots/2018/01/18/578355877/repeated-head-hits-not-concussions-may-be-behind-a-type-of-chronic-brain-damage>
 - a. Independent Variable(s):
 - i. Values:
 - b. Dependent Variable(s):
 - i. Values:
 - c. Possible Confounds:
4. “High-salt diet could cause dementia, study finds” *KRMG* January 18, 2018 <http://www.krmg.com/lifestyles/health/high-salt-diet-could-cause-dementia-study-finds/fxzwMnXlhFuGG6I4oPS0DP/>
 - a. Independent Variable(s):
 - i. Values:
 - b. Dependent Variable(s):
 - i. Values:
 - c. Possible Confounds:

5. “Grind your teeth at night? Botox may help” *Chicago Tribune* January 18, 2018
<http://www.chicagotribune.com/lifestyles/health/sc-hlth-botox-help-grinding-teeth-0124-story.html>
- a. Independent Variable(s):
 - i. Values:
 - b. Dependent Variable(s):
 - i. Values:
 - c. Possible Confounds:

Other Practice Questions:

1. What is *not* a requirement for a statement to be considered a hypothesis?
 - a. Clear specification of direction of relationship
 - b. Falsifiability
 - c. Not normative or value based
 - d. Must be completely verifiable
2. Which of the following is a property/variable (not a fact or category)?
 - a. Education level
 - b. A highly educated person
 - c. Educated people
 - d. Twelve years of education
3. The presumed relationship between variables X and Y is said to be “spurious.” This means that:
 - a. Both X and Y are dependent on some third variable. They have no direct impact on each other.
 - b. The causal relationship between X and Y is reversed (Y is really the independent variable)
 - c. Another variable influences changes in Y but *not* X. No causal link exists between the two
 - d. The two variables are just connected by historical coincidence

Additional Resources for Help and Review:

- Help writing a hypothesis, independent variables, and dependent variables:
 - <https://www.youtube.com/watch?v=bp2fbzWZDmA>
 - <https://www.youtube.com/watch?v=K4sObJbN4JU>
- Confounding variables:
 - <https://www.youtube.com/watch?v=UEio4SS9ut8>
 - <https://www.youtube.com/watch?v=-daUPdUV8C4>
- Spurious Correlations:
 - <https://www.youtube.com/watch?v=g-g0ovHjQxs>
 - <https://www.youtube.com/watch?v=WNsLcg2GQMY>
 - <https://www.youtube.com/watch?v=VMUQSMFGBDo>

Identifying Independent and Dependent Variables – Answer Key

News articles, just like research articles, often explore causal relationships. In the following news headlines, identify the independent and dependent variables, as well as examples of what values those variables could take on. As a bonus, try explaining the causal mechanism if you can—Reading the articles should reveal the answer to you. You could also try to think of possible confounds.

6. “Trump makes fewer public trips than recent presidents. Will that hurt the Republicans in November?” *The Monkey Cage* January 17, 2018.
https://www.washingtonpost.com/news/monkey-cage/wp/2018/01/17/trump-makes-fewer-public-trips-than-recent-presidents-will-that-hurt-the-republicans-in-november/?utm_term=.273354e990a2
 - a. Independent Variable(s): Number of public trips taken by presidents
 - i. Values: 0,1,2,3,...
 - b. Dependent Variable(s): Number of Republicans elected in November elections
 - i. Values: 0,1,2,3,...
 - c. Possible Confounds: Presidential approval rating: Maybe if the president has a high approval rating, he makes more public trips, thus the approval rating is causally prior to the public trips and correlated with public trips; higher presidential approval is also correlated with the performance of the incumbent’s party, thus approval is also correlated with the dependent variable.
7. “Do lawmakers respond to immigrants’ requests? The answer depends on ethnicity and race.” *The Monkey Cage* January 16, 2018. https://www.washingtonpost.com/news/monkey-cage/wp/2018/01/16/do-lawmakers-respond-to-immigrants-requests-the-answer-depends-on-ethnicity-and-race/?utm_term=.21dfdc208a7b
 - a. Independent Variable(s): Immigrant race and ethnicity (if you read the article, you’d see that it’s a bit more nuanced—they look at nativity (immigrant or native-born) and race/ethnicity (Black, Latino, Asian, White), but if you just read the headline, saying immigrant race and ethnicity would be fine)
 - i. Values: Black, Latino, Asian, White (race/ethnicity); Native-born/immigrant (nativity)
 - b. Dependent Variable(s): Lawmaker response
 - i. Values: Respond, Not respond
 - c. Possible Confounds:
8. “Repeated Head Hits, Not Just Concussions, May Lead To A Type Of Chronic Brain Damage” *NPR* <https://www.npr.org/sections/health-shots/2018/01/18/578355877/repeated-head-hits-not-concussions-may-be-behind-a-type-of-chronic-brain-damage>
 - a. Independent Variable(s): Number of repeated head hits [could also include number of concussions]
 - i. Values: 0,1,2,3,...
 - b. Dependent Variable(s): Chronic brain damage
 - i. Values: Have chronic brain damage; don’t have chronic brain damage
 - c. Possible Confounds: Risk aversion: Those who are more risk-averse (avoid taking risks) might be less likely to engage in activities, such as football, that increase the likelihood of head injuries. Thus risk aversion is correlated with and causally prior to repeated head hits. But, risk aversion could also be correlated with the likelihood of engaging in other activities that could lead to brain damage, thus it is also correlated with the dependent variable.
9. “High-salt diet could cause dementia, study finds” *KRMG* January 18, 2018
<http://www.krmg.com/lifestyles/health/high-salt-diet-could-cause-dementia-study-finds/fxzwMnXlhFuGG6I4oPS0DP/>

- a. Independent Variable(s): Amount of salt in diet
 - i. Values: percent daily salt intake consumed (0%, 1%, 2%, ...); milligrams of salt consumed daily, etc.
 - b. Dependent Variable(s): Dementia
 - i. Values: has dementia, doesn't have dementia
 - c. Possible Confounds: Age. Maybe older individuals consume more salt in their diets than younger individuals, thus age is correlated with and causally prior to the amount of salt in one's diet. Age is also correlated with the dependent variable since older individuals are more likely to get dementia than younger individuals.
10. "Grind your teeth at night? Botox may help" *Chicago Tribune* January 18, 2018
<http://www.chicagotribune.com/lifestyles/health/sc-hlth-botox-help-grinding-teeth-0124-story.html>
- a. Independent Variable(s): Having Botox
 - i. Values: Botox, No Botox
 - b. Dependent Variable(s): Teeth grinding
 - i. Values: Grinds teeth, doesn't grind teeth; OR minutes spent grinding teeth: 0,1,2,3,...
 - c. Possible Confounds:

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