Additional Exercises for Developing Good Hypotheses: Rewriting Hypotheses

This section provides an opportunity for you to practise writing and developing good empirical hypotheses. Below are a number of different empirical statements that you should try to improve, as we did together in the 'Crafting Good Hypotheses' section. Remember that the goal is to get the correct structure of a clear, testable empirical hypothesis; whether or not the expected effect makes intuitive sense is only a side concern. Underneath each statement, suggested values for the variables and the unit of analysis are provided to help you construct the hypotheses. Note that you do not need to use all of the variable values provided when crafting hypotheses. Additionally, you might want to consider slightly different versions of the suggested values; for example, instead of good or bad, you might use better or worse.

1. There is a relationship between individuals' political ideology and vote choice.
    - Political ideology: liberal, conservative
    - Vote choice: liberal party/candidate, conservative party/candidate
    - Unit of analysis: individuals
2. An individual's level of education and their health status are related.
    - Education level: high (e.g., college degree), low (e.g., did not finish secondary school)
    - Health status: good, bad; might also substitute better or worse
    - Unit of analysis: individuals
3. Cities with high poverty rates have high murder rates.
    - Poverty rates: high, low
    - Murder rates: high, low
    - Unit of analysis: cities
4. The average length of prison sentences is related to whether a US state has elected judges.

- Prison sentences: short, long
- Elected judges: have elected judges, do not have elected judges
- Unit of analysis: US states

5. Countries with free university costs have more first-time university students.
    - University cost: free, not free; might also substitute high cost, low cost
    - University students: first-time, not first-time (with regard to whether first in family to go to university)
    - Unit of analysis: countries
6. The amount of tourism affects the amount of affordable housing in cities.
    - Tourism: high, low
    - Housing: affordable, not affordable
    - Unit of analysis: cities
7. Sales tax percentage is related to economic growth in a US state.
    - Sales tax: high, low
    - Economic growth: high, low
    - Unit of analysis: US states; might also substitute counties, provinces, or countries
8. Bounties for invasive snakes are related to the number of invasive snakes in a city.
    - Bounties: bounty, no bounty
    - Invasive snakes: more, fewer
    - Unit of analysis: cities; might also substitute counties, provinces, or countries

9. Countries with the death penalty have less crime.

- Death penalty: have, do not have
- Crime: more, less
- Unit of analysis: countries

10. The number of city parks is related to happiness in cities.

- City parks: many, few
- Happiness: happy, not happy
- Unit of analysis: cities

11. The number of cloudy days is related to the number of suicides in cities.

- Cloudy days: many, few
- Number of suicides: many, few
- Unit of analysis: cities

12. The strength of national identity is related to the likelihood of secession.

- National identity: strong, weak
- Secession: likely, not likely
- Unit of analysis: nations

13. Consumption of fizzy drinks leads to tooth enamel decay.

- Fizzy drinks: a lot, a little
- Tooth enamel: decay, no decay
- Unit of analysis: individuals

14. Anonymous job applications are related to fairness in hiring.

- Job applications: anonymous, not anonymous

- Fairness: fair, unfair
- Units of analysis: companies

15. Internet speed is related to technological innovation.
    - Internet speed: fast, slow
    - Economic growth: high innovation, low innovation
    - Unit of analysis: countries; might also substitute cities, counties, states, or provinces

Additional Exercises for Developing Good Hypotheses: Beginning with Variables

It is one thing to take pre-existing statements and rewrite them to create better hypotheses. It is another thing to be given two variables and create hypotheses from scratch; traditionally, students find this more difficult. This section includes some examples for you to practise with. Intuition about the nature of the relationship between two variables is helpful, but again we are concentrating on developing good empirical hypotheses, which we can test to determine if they have merit or not. As in the previous section, values for the variables and the unit of analysis are provided to assist in the formation of hypotheses. Again, you do not need to use all the values and you may consider alternatives to some of the suggested values and words.

1. Write a good hypothesis using the following:
    – Political ideology: liberal, conservative
    – Religious service attendance frequency: frequent, not frequent
    – Unit of analysis: individuals

2. Write a good hypothesis using the following:
    – City taxes: high, low
    – Road quality: good, bad
    – Unit of analysis: cities

3. Write a good hypothesis using the following:
   - Political stability: stable, unstable
   - Infectious disease control outbreaks: control, not control
   - Unit of analysis: countries

4. Write a good hypothesis using the following:
   - Government scandal: scandal, no scandal
   - Media coverage of government: critical coverage, not critical coverage
   - Unit of analysis: governments

5. Write a good hypothesis using the following:
   - Health insurance: has health insurance, does not have health insurance
   - Health status: healthy, unhealthy
   - Unit of analysis: individuals

SUGGESTED ANSWERS FOR 'REWRITING HYPOTHESES' SECTION

Below are suggested answers for the section on rewriting hypotheses. These do not constitute an exhaustive list, but offers several possible correct versions.

1. Possible hypotheses:
   (a) Individuals who are liberal are more likely to vote for the liberal party/candidate than individuals who are conservative.
   (b) Individuals who are conservative are more likely to vote for the conservative party/candidate than individuals who are liberal.

2. Possible hypotheses:
   (a) Individuals with a high education level are expected to have a good health status compared to individuals with a low education level.

(b) Highly educated individuals are expected to have better health than poorly educated individuals.

(c) As education level increases, individuals' health is expected to be better.

3. Possible hypotheses:

(a) Cities with high poverty rates are expected to have high murder rates compared to cities with low poverty rates.

(b) Cities with low poverty rates are expected to have low murder rates compared to cities with high poverty rates.

(c) As the poverty rate in a city increases, the murder rate is expected to increase.

4. Possible hypotheses:

(a) US states that have elected judges are expected to have long average prison sentences compared to US states that do not have elected judges.

(b) US states that do not have elected judges are expected to have short average prison sentences compared to US states that do have elected judges.

5. Possible hypotheses:

(a) Countries with free university costs are expected to have more first-time university students than countries without free university costs.

(b) Countries with low university costs are expected to have more first-time university students than countries with high university costs.

(c) As the cost of university increases, countries are expected to have fewer first-time university students.

6. Possible hypotheses:

(a) Cities with a high amount of tourism are expected to have less affordable housing than cities with a low amount of tourism.

(b) High-tourism cities are expected to have more unaffordable housing compared to low tourism cities.

(c) As the amount of tourism increases, affordable housing in cities decreases.

7. Possible hypotheses:

(a) US states with high sales tax are expected to have lower economic growth than US states with low sales tax.

(b) High-sales-tax US states are expected to have low economic growth compared to low-sales-tax US states.

(c) As sales tax increases in a state, economic growth is expected to decrease.

8. Possible hypotheses:

(a) Cities that offer bounties for invasive snakes are expected to have fewer invasive snakes than cities that do not offer bounties.

(b) Cities that do not offer bounties for invasive snakes are expected to have more invasive snakes than cities that do offer bounties.

9. Possible hypotheses:

(a) Countries that have the death penalty are expected to have less crime than countries that do not have the death penalty.

(b) Countries that do not have the death penalty are expected to have more crime than countries that do have the death penalty.

10. Possible hypotheses:

(a) Cities with many parks are expected to have higher levels of happiness than cities with few parks.

(b) Cities with few parks are expected to have lower levels of happiness than cities with many parks.

(c) As the number of city parks increases, the level of happiness in the city is expected to increase.

11. Possible hypotheses:

(a) Cities with many cloudy days are expected to have many suicides compared to cities with few cloudy days.

(b) Cities with few cloudy days are expected to have few suicides compared to cities with many cloudy days.

(c) As the number of cloudy days in a city increases, the number of suicides is expected to increase.

12. Possible hypotheses:

(a) Nations with a strong national identity are more likely to secede compared to nations with a weak national identity.

(b) Nations with a weak national identity are less likely to secede compared to nations with a strong national identity.

(c) As the strength of a nation's identity increases, the likelihood of seceding increases.

13. Possible hypotheses:

(a) Individuals who consume a lot of fizzy drinks are expected to have more tooth decay than individuals who consume few fizzy drinks.

(b) Individuals who consume few fizzy drinks are expected to have less tooth decay than individuals who consume a lot of fizzy drinks.

(c) As consumption of fizzy drinks increases, individuals are expected to have more tooth decay.

14. Possible hypotheses:

(a) Companies that use anonymous job applications are more likely to have fair hiring practices than companies that do not use anonymous job applications.

(b) Companies that do not use anonymous job applications are more likely to have unfair hiring practices than companies that do use anonymous job applications.

15. Possible hypotheses:

(a) Countries with fast internet speeds are expected to have high levels of technological innovation compared to countries with slow internet speeds.

(b) Countries with fast internet speeds are expected to have higher levels of technological innovation than countries with slow internet speeds.

(c) As internet speeds increase in a country, technological innovation is expected to increase.

SUGGESTED ANSWERS FOR 'BEGINNING WITH VARIABLES' SECTION

Below are suggested answers for the section on creating hypotheses when starting just with variables. These do not constitute an exhaustive list, but offers several possible correct versions.

1. Possible hypotheses:

(a) Individuals who frequently attend religious services are expected to be (more) conservative compared to individuals who do not frequently attend religious services.

(b) Individuals who do not frequently attend religious services are

expected to be (more) liberal compared to individuals who do frequently attend religious services.

(c) As attendance at religious services increases, individuals are expected to be more conservative.

2. Possible hypotheses:

(a) Cities with high taxes are expected to have good roads compared to cities with low taxes.

(b) Cities with high taxes are expected to have better roads compared to cities with low taxes.

(c) Cities with low taxes are expected to have worse roads compared to cities with high taxes.

(d) As city taxes increase, road quality in cities is expected to increase.

3. Possible hypotheses:

(a) Politically stable countries are expected to control infectious disease outbreaks compared to politically unstable countries.

(b) Political unstable countries are expected to not control infectious disease outbreaks compared to political stable countries.

4. Possible hypotheses:

(a) Governments involved in scandals are expected to receive more critical media coverage compared to governments not involved in scandals.

(b) Governments not involved in scandals are expected to receive less critical media coverage compared to governments involved in scandals.

5. Possible hypotheses:

(a) Individuals who have health insurance are expected to be healthy compared to individuals who do not have health insurance.

(b) Individuals who have health insurance are expected to be healthier than individuals who do not have health insurance.