Research methodology in economics

Lecture 2 - Hypotheses

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Office hours (Room 5C.30)
Monday 15:15 – 16:00
Wednesday 12:30 – 13:15

Literature:

- Johnson, J. B., Reynolds, H. T., & Mycoff, J. D. (2015). Political science research methods. Cq Press.
- Friedman, S., Friedman, D., & Sunder, S. (1994). Experimental methods: A primer for economists. Cambridge University Press.
- Puškárová, P. (2019). Elementárium ekonomického výskumu. Bratislava: Vydavateľstvo EKONÓM, 2019

So you have your research question…

- What do you do after figuring out your research topic (motivation), doing your literature review and narrowing down your research questions?

- Propose a suitable explanation for the phenomena you are interested in (the “why” of your research question)

- Formulate testable hypotheses

- Define the concepts identified in the hypotheses (what exactly it is that you will measure and analyse)

Proposing explanations

- Once your research question is developed, you need to propose an explanation (e.g. identify a phenomena/concept) that may provide you with the answer. Often you will need to identify more phenomena and specify how they are related.

- To help clarify relationships between phenomena, scientists refer to phenomena as variables and identify several types of variables.

- A phenomenon that we think will help us explain our observations or behavior is called an **independent variable**. Independent variables are thought to influence, affect, or cause some other phenomenon.

- A **dependent variable** is thought to be caused, to depend upon, or to be a function of an independent variable.

- Thus, if a researcher has hypothesized that acquiring more formal education will lead to increased income later on (in other words, that income may be explained by education), then years of formal education would be the independent variable, and income would be the dependent variable.

- As the word variable connotes, we expect the value of the concepts we identify as variables to vary or change. A concept that does not change in value is called a constant and cannot be used to investigate a relationship.

Variables

- Sometimes, in addition to proposing that independent variables are related to the dependent variable, researchers propose relationships between the independent variables.

- In particular, we might want to determine which independent variables occur before other independent variables and indicate which ones have a more direct, as opposed to indirect effect on the phenomenon we are trying to explain (the dependent variable).

- A variable that occurs prior to all other variables and that may affect other independent variables is called an **antecedent** variable. A variable that occurs closer in tillle to the dependent variable and is itself affected by other independent variables is called an **intervening** variable.

Arrow diagram

- Explanatory schemes that involve numerous independent, alternative, antecedent, and intervening variables can become quite complex. An arrow diagram is a handy device for presenting and keeping track of such complicated explanations.

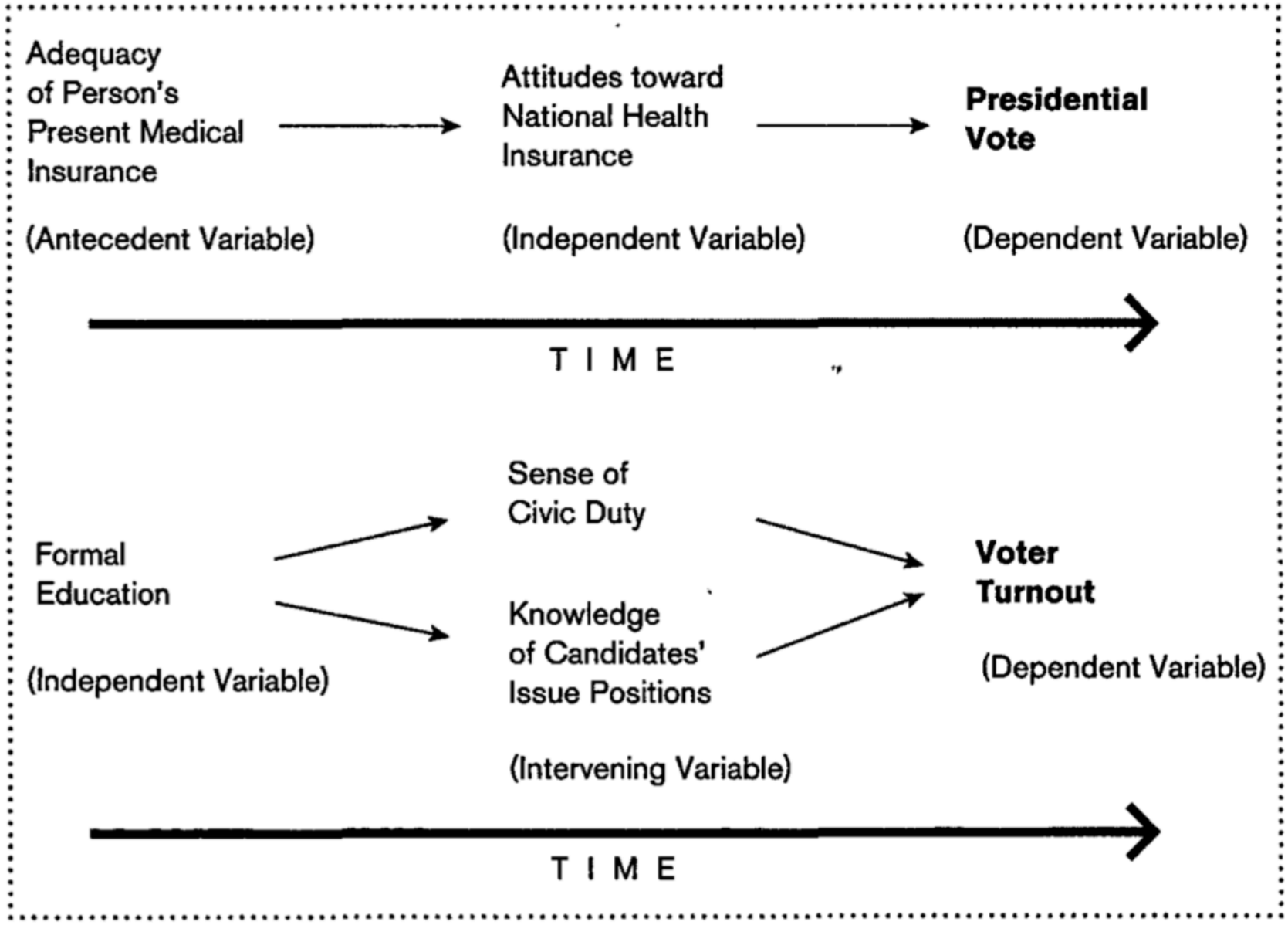
- The arrow diagram specifies the phenomena of interest; indicates which variables are independent, alternative, antecedent, intervening, and dependent; and shows which variables are thought to affect which other ones.

- Arrows indicate that one variable is thought to explain or be related to another; the direction of the arrow indicates which variable is independent and which is dependent in that proposed relationship.

- Arrow diagrams show hypothesized causal relationships. A one-headed arrow connecting two variables is a shorthand way of expressing the proposition "X directly causes Y”. If arrows do not directly link two variables, the variables may be associated or correlated, but the relationship is indirect, not causal.

- Note that when we assert X causes Y, we are in effect making three claims. One is that X and Y covary - a change in one variable is associated with a change in the other. Also, we are claiming that a change in the independent variable (X) precedes the change in the dependent variable (Y). Finally,we are stating that the covariation between X and Y is not simply a coincidence or spurious - that is, due to change in some other variable, but is direct.

FIGURE 4-1 **Arrow Diagram of Adequacy of Medical Insurance and Voter Turnout Examples**



Formulating Hypotheses

- A hypothesis is an explicit statement that indicates how a researcher thinks phenomena of interest (variables) are related. It proposes a relationship that subsequently will be tested with empirical observations of the variables.

- A hypothesis is a guess (but of an educated nature) that indicates how an independent variable is thought to affect, influence, or alter a dependent variable.

- Since hypotheses are proposed relationships, they may turn out to be incorrect and not supported by the empirical evidence.

- For a hypothesis to be tested adequately and persuasively, it must be stated properly. It is important to start a research project with a clearly stated hypothesis because it provides the foundation for subsequent decisions and steps in the research process. A poorly formulated hypothesis often indicates confusion about the relationship to be tested or can lead to mistakes that will limit the value or the meaning of any findings.

- A good hypothesis has six characteristics: (1) it is an empirical statement, (2) it is stated as a generality, (3) it is plausible, (4) it is specific, (5) it is stated in a manner that corresponds to the way in which the researcher intends to test it, and (6) it is testable.

Good hypothesis is…

1. Empirical statement - open question, proposing a relationship that can be empirically observed. Not a normative statement (opinions, preferences).

2. General - it should propose a relationship pertaining to many occurrences of a phenomenon rather than just to one occurrence.

3. Plausible - there should be some logical reason for thinking that it might be confirmed.

4. Specific - it should not simply state that variables are associated; rather, it should indicate the direction of the expected relationship (positive - if X inceases then Y increases, or negative - if X increases then Y decreases) between two or more variables. Also, it must be clear what variables X and Y mean (it must be easy to say how to measure variables).

5. Testable - it must be possible and feasible to obtain data that will allow one to test the hypothesis.

Conclusion

- A research project must provide - to both the producer and the consumer of social scientific knowledge - the answers to these important questions:
    - What phenomenon is the researcher trying to understand and explain?
    - What explanation has the researcher proposed for the behavior or attributes in question?
    - What are the meanings of the concepts used in this explanation?
    - What specific hypothesis relating two or more variables will be tested?
    - What is the unit of analysis for the observations?

Questions?

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