

Codebook Critique—Teaching New Researchers about Measurement and Operationalization

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Abstract: Educating 21st century citizens requires lessons in data literacy, allowing learners to better understand and use the large amounts of information available to them. We must encourage our students to go beyond taking data as given, asking them to think critically about where it came from—Who collected it? For what purpose? What did they include/exclude? These questions dovetail with commonly taught topics in research methods courses, such as conceptualization, measurement, and operationalization, that may not be covered in substantive courses. This article describes a course module (of two to four 50-minute sessions) called “Codebook Critique,” where students are asked to review and critically evaluate the codebook from a publicly-accessible dataset. While originally used in an upper-division International Relations course, the exercise is flexible in that the assignment can be split into its component parts as appropriate for course-level and applied in various subfields.

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Introduction

As facility with evidence and data have become more crucial to being an engaged citizen (Hill and Myers 2014) and finding success in the contemporary job market, there has been an increase in interest in institutions of higher education and amongst faculty in promoting data and information literacy. Doing so will not only help our students get jobs after they leave college, but also help them get the most out of their educational experience while they are still with us. In response to this critical need, Political Science departments have been increasingly offering and requiring courses in research methods (Turner and Thies 2009).

Publications that have focused on the classroom practices associated with teaching research methods, while useful, have largely focused on statistical analysis (Li 2019) or the completion of undergraduate research projects (Knoll 2016), but not matters of measurement and operationalization.¹ Furthermore, with few exceptions (Dickovick 2009; Morehouse et al. 2017), discussions of these practices focus on the introductory methods course or capstone courses.

This paper discusses a course module and associated assignment(s) called “Codebook Critique” in which students are given the opportunity to consider issues of measurement and operationalization in quantitative data collection. The module has been used in both introductory and upper-division, methods and substantive subfield courses. In order to teach students to read, understand, and critique empirical research, they need to understand measurement and operationalization, where data comes from, and how these factors affect the validity of claims made by scholars.

Overview of the Assignment

The “Codebook Critique” consists of a sequence of activities and assignments that I have used to teach students about measurement and the implications of the choices researchers make when they code data. In this article, I describe how I used the module in an upper-division course in International Security (that meets for fifty minutes, three times a week), but I have used variants of the assignment in Introduction to International Relations and Introduction to Research

¹ For useful exceptions, see Fisher and Justwan (2017) and Rosen (2018).

Methods courses, as well. While this article reflects my personal experiences in teaching these particular subjects, it will be applicable in other subfields, particularly Comparative Politics, where similar data (i.e. cross-national statistics, event data) are common. In the conclusion of the paper, I discuss adjustments that I have made for use in other courses and how the assignment might be adapted for those in other empirical subfields.

Faculty should first choose a small number of datasets commonly used in your subfield for students to review and a companion article that uses the data for its analysis. I assign datasets based on either a survey on students' interests given earlier in the class, the topics of the students' course projects, or a class vote prioritizing certain topics from a larger list.² Giving students choice in topics has been shown to positively impact both their feelings and attitudes toward learning about research methods (Hardaway and Stroud 2014). For practical reasons, is advisable to give the same dataset to groups of students, not individuals.

Class Sessions

Depending on the course, I use between two and four class sessions on this topic. My course meetings are generally fifty-minute sessions, so that should be kept in mind by faculty wishing to use this in their own courses.

Session 1: Introduction to Measurement and Operationalization

In-Class Activity: Ask students to define a concept relevant to the course's content. In my International Security course, I ask them about power. How would they know it when they saw it? If they needed to determine who had more and who had less, how would they measure it? Where would they get the information that they would need? In order to facilitate their brainstorming, I use the 'think-pair-share' approach, where students are given five minutes to write down their thoughts and then discuss their response with a classmate (or classmates) nearby, before sharing their thoughts with the entire class. When doing this activity in a large

² If you assign course projects in which students are encouraged to use quantitative data, this assignment is a great way to orient them to using that data. Even if they will not be using data directly in the course, faculty may want to emphasize that knowing about data and where it comes from will make them better consumers and evaluators of research, both in the classroom and out.

lecture course, I've used the polling platform Poll Everywhere,³ which has an option that allows respondents to submit text answers to a question. The text is then used to automatically generate a word cloud that we can then refer to in a wider discussion.

After discussing students' responses, give some examples of how scholars have measured the concept. For power, I mention GDP, military expenditures, and CINC scores (an index of military capabilities). Then we discuss why researchers would choose different indicators. What does it say about their idea of how the world works? Is one measure more valid than another? Does it depend on how you want to use it?

We also spend some time talking specifically about characteristics of datasets that we might care about when we are evaluating empirical research. In my course, this is tied back to a previous course reading by Singer (1961) on the levels-of-analysis problem in International Relations. I highlight the fact that a great deal of the data that is used in International Relations is country-year and provide information on common variants, like dyad-year. This opens up a discussion of geographic and temporal coverage as important characteristics of a dataset. Students are asked to brainstorm reasons why we might want to know this information and common responses include differences between regional and global trends and changes over time—increases in levels of globalization and democratization, important events like the end of the Cold War or September 11th—that might have an impact on a broad swathe of countries. I stress that this is important because the type of data used in analysis can influence the results of our research (Geddes 2003).

Session 1a: Library Resources for Discovering and Accessing Quantitative Data

Time and access permitting, it can also be useful to schedule a session with a campus librarian to review online sources of quantitative data, either available freely online or through the library website.⁴ Faculty might suggest useful sources of data, as well as incorporating suggestions from the librarian. Resources that I have introduced to my International Security course include the Inter-university Consortium for Political and Social Research, the World Development Indicators, the World Economics and Politics Dataverse, the Correlates of War Project, and the Uppsala Conflict Data Program. Links to relevant websites for accessing these data resources are

³ <https://www.polleverywhere.com>

⁴ If you already schedule a library session in your course and adding an additional session is not feasible, you might ask the librarian to cover data resources during the earlier session.

posted on the course management site so that students may return to them later. Having a session with a librarian can also open the door for follow-on discussions between students and library staff.⁵

At the end of either Session 1 or 1a, students are given the Codebook Critique assignment prompt⁶ and a specific dataset to critique. Depending on the size of the class and areas of student interest, one might assign either a single dataset for the entire group to critique or to divide students up into sub-sets that each look at a different dataset.⁷ There are advantages and disadvantages to both. A single dataset may seem less intimidating to students because there is a sense that ‘we’re all in this together’ and students may seek help from any of their colleagues. However, it does limit the number and variety of types of data to which they will be exposed in the follow-on sessions. With small groups, you can introduce that variety, but students might feel more intimidated as groups get smaller and their own responsibility for completion of the assignment gets higher. I have found that groups of four work best and regularly assign more than one group to a single dataset.

When assigning datasets in my International Relations courses, I have generally chosen groups of datasets that purport to measure the same or very similar concepts like ‘conflict’ (Correlates of War, International Crisis Behavior, Uppsala Conflict Data Project) or ‘democracy’ (POLITY, Democracy-Dictatorship, V-DEM). This is helpful for generating discussion that goes beyond how well a single dataset measures a concept and gets students thinking and talking about our collective knowledge regarding a phenomenon.

Session 2: Codebook Critique

Assignment: The students are asked to come to class prepared with written answers to the questions about the assigned codebook in the figure below.

⁵ While this is a fairly limited set of interactions, interested readers may want to explore the more intensive modes of collaboration with librarians offered by Gilbert, Knutson, and Gilbert (2012) and Shannon and Shannon (2016).

⁶ The prompt is described in the next section and interested readers will find the assignment itself included in the Appendix.

⁷ Even if you choose different datasets, it is useful to find a group that measure the same or similar concepts. Based on experience, I would suggest no more than four different datasets for the assignment.

Figure 1. Codebook Critique Assignment Questions

- What is the stated purpose (if any) of the dataset? What was it designed to tell us?
- Who collected the data?
- What is the level of analysis?
- What is the geographic coverage?
- What is the temporal coverage?
- What are the main variables coded?
- How are the main variables coded?
- What values can those variables take on?
 - Nominal, yes/no, ordinal, part of an index, continuous
- How well does the operationalization of the main variable capture the concept of interest?
- What do you think are advantages/disadvantages of using this data in a study?

In-class Activity: Students that critiqued the same dataset come together to discuss their responses to the assignment.⁸ Each group reports back to class orally about their discussion. Then the class talks about common discoveries, issues, what they found most interesting.

At this point, I return to some of the themes of the previous class session, emphasizing the difficulties in measuring abstract concepts. I talk about my own experience collecting data, the tough choices that I had to make, and how I justified them.⁹

Session 3: Companion Article Critique

Assignment: Students are assigned an article that uses their dataset from Session 2.¹⁰ Faculty might choose to use articles that use simpler statistical models, so as to tamp down any math anxiety. If you only use one dataset for the entire class in the previous session, you might consider dividing the class into groups for this assignment, giving each group a different article that uses the same data.

The students are asked to come to class prepared with written answers to the questions about the assigned article in the figure below.¹¹

⁸ Discussion groups work best with four or five students, so if, for whatever reason, you have more students assigned to a particular dataset, divide them into smaller groups for this part of the exercise.

⁹ In the optional Practice Coding session described later, I have students try their hand at coding data from one of my own projects, drawing a line from my experience to theirs.

¹⁰ Earlier in the course, I spend a session teaching students how to read a journal article; faculty considering using the assignment might find such a session to be a helpful preparatory step. Leanne Powner's "How to Read Political Science" and 'article helpers' are very useful in this regard.

¹¹ If the assignment is not part of the progression to a final class project, faculty can omit the last question in the prompt.

Figure 2. Companion Article Critique Questions

- Summarize the article, with a particular emphasis on how the data was used
- Did knowing how the data was coded help you understand the article? How?
- What are some critiques you have of the article?
- Did knowing the data help you critique the article? How?
- Does this give you any ideas about how you could use this data in your final project?

In-class Activity: Students that critiqued the same article come together to discuss their responses to the assignment. Each group reports back to class orally. Then the class talks about common critiques, their implications, when the data can strengthen or weaken the claims made by the authors.

Optional Session: Coding Practice

Assignment: To give students an idea of what coding data is like, I set up an online interface¹² where they are given a series of news articles and asked to code whether a defined ‘event’ occurred and, if so, some of its characteristics. Specifically, for this course, we talked about how scholars in International Relations identify when ‘conflict’ occurs. I gave the students news articles about the South China Sea that I had collected in the course of my own research and asked if, based on a definition that was given to them, if there was an ‘escalatory military event’ reported. If they answered yes, they were asked to select the type of event from a pre-determined list and identify the countries and military assets (planes, ships, troops) involved.

In-Class Activity: Students report back about their experiences coding. What was the easiest to code? What was the toughest decision to make? Did any of the coding rules need to be clarified based on the real world cases that they were given? We review the aggregates of the coding decisions made by the class and the students are asked to discuss the thought-process behind their codings. This feeds into a general discussion of the practical application of codebooks and

¹² I initially used a crowd-sourcing website, Figure Eight. This was ideal, as it allowed for students to look at a large number of different newspaper articles and the crowd-sourcing aspect allowed for interesting discussions about inter-coder reliability and scaling data collection. Unfortunately, the company was purchased by another firm and the functionality I used for free previously is pay-only now. My best alternative to meet my pedagogical goals is a simple survey using Google Forms or Qualtrics, but faculty may want to keep an eye out for crowd-sourcing platforms that become available in the future.

how they may be revised and refined iteratively during the data collection process. Students are also introduced to the concept of inter-coder reliability and how researchers make decisions when coders disagree.

Many students note that this is an activity that they particularly enjoy, as it involves hands-on application of the concepts related to measurement and operationalization. It also provides an opportunity to encourage students to pursue undergraduate research opportunities, like working for a faculty member or writing an honors thesis. For students who might not think of themselves as potential researchers, particularly those who come from groups that are underrepresented amongst the professoriate, low-stakes demonstrations of their own efficacy as researchers can be eye-opening.

Conclusion and Applications in Different Contexts

This article introduced a series of class sessions and assignments that teach students about the role that measurement and operationalization play in the production of knowledge. The series begins with a class-based discussion of the operationalization of concepts in Political Science and moves to a series of assignments that bring out the ways in which different coding decisions have implications for the outcomes of studies. Students are asked to evaluate a codebook for a dataset based on a series of questions guided by standards for information literacy. They are then asked to use what they learned about the data to critique a peer-reviewed article that uses it. An optional follow-on activity asks them to code data themselves, giving them hands-on experience with the difficult choices that researchers must make when determining values for their variables.

While the assignments featured here were developed in an upper-division course in International Security, they may also be adapted for introductory courses¹³ and those in other empirical subfields of Political Science. Adapting this assignment to an introductory course may pose two difficulties: 1) students' level of preparation and 2) that, at many institutions, these courses tend to be larger in size. When I have used this exercise in a large introductory methods course, it is much shorter. One lecture session is used to share a pared-down version of Session 1 and students are given a simplified version of the assignment from Session 2 that they then

¹³ Additionally, a version of this exercise would not be out of place in a first-year graduate course.

discuss in class. In this instance, it is best to have all students look at a single dataset. Students can be asked to speak with those around them for the discussion portion of the activity or it can also be something that they cover in that week's small discussion section, if those are a part of your course.

Porting this assignment to another subfield of empirical political science should be fairly straightforward. I would recommend that faculty consider the following criteria in choosing a dataset(s):

- 1) is publicly-available
- 2) you are familiar with its coding and application in the literature
- 3) has a reasonably complete and understandable codebook
- 4) measures a concept that students find interesting and important
- 5) is frequently used in the literature in your field or sub-field
- 6) has broad coverage across time, geography, etc.

Learning about measurement and operationalization is important for students, both as consumers and future producers of knowledge. It can aid in their understanding and analysis of assigned readings, completion of assignments and course projects, and may even motivate them to pursue and find success in extra-curricular research activities or capstone experiences (Hinckley, McGuire, and Danforth 2019).

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