

‘It was my understanding that there would be no math’:
Using Thematic Cases to Teach Undergraduate Research Methods¹

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Abstract. Undergraduates frequently approach research methods classes with trepidation and skepticism, owing in part to math-phobia and confusion over how methodology is relevant to their interests. These self-defeating barriers to learning undermine the efficacy of methods classes. This essay discusses a strategy for overcoming these barriers—use of a case study as a thematic framework for the class. In theory, the case study engages students and renders the material less abstract. A research methods class recently taught by the author was organized around political assassinations, with an initial framing focus the assassination of President John F. Kennedy. In an end of semester Qualtrics survey, students reported that they liked this approach and believe that it kept them interested in the material.

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“[S]tats are dry. The Kennedys are not dry.” ~ A student

Introduction

Nearly all who have taught undergraduate research methods can attest that students frequently approach the material with trepidation and skepticism. Students are drawn to political science because of an interest in politics, but they have not necessarily looked under the hood to consider how we know what we know. And because their sense of the discipline is heavy on the “politics” and light on the “science,” the methods requirement seems unrelated to their interests and may trigger anxiety. The political science major, however, is more than punditry, casual observation, and motivated reasoning. As the Wahlke Report (1991, 49) observes, the major provides a systematic way of knowing that includes epistemological assumptions, methodological practices, and a resulting body of knowledge. As such, the Report encourages departments to incorporate methods literacy into political science undergraduate curricula. This is crucial for equipping students with the analytical skills necessary for sophisticated navigation of political contexts.

Several barriers prevent students from approaching methods classes with an open mind and a readiness to learn, and these barriers limit the overall efficacy of methods classes. First, students come to these classes with limited exposure to the research process. Bos and Schneider (2009) find that while 61% of students have experience critiquing literature, only 49% have experience devising research questions, and fewer than 40% have familiarity with statistical analysis, measurement, or sample sampling. The upshot is that students may know whether or not they approve of the job President Trump is doing, for example, but they are out of their depth when it comes to investigating and explaining mass level approval. Second, many students are math-phobic (Buchler 2009, Murphy 2015, Sloomaeckers, Kerremans, and Adriaensen 2014). This causes panic and self-doubt among even the brightest students. When the class broaches quantitative techniques, students’ pre-conceived notions about their ability to

understand the material undermine learning. When confusion arises, a non-trivial number respond, “math is too hard,” rather than, “can you go over that again? I’m not sure I understand.” How, then, can instructors help students to lower their guard, keep an open mind, and overcome their anxieties? Providing students with examples of peer developed research has been shown to help by boosting self-confidence (Murphy 2015). Bernstein and Allen (2013) find great success in structuring courses such that they start with qualitative methodologies and build to quantitative techniques. In this way, students start “off within their comfort zone before pushing them outside it” (2).

This essay describes the strategy I recently employed. Having taught undergraduate research methods, my sense was that student dissatisfaction arises in part because students do not understand how the material connects to the larger curriculum. This makes it difficult to get past the math-phobia. As such, I organized the class around a single thematic case: the class was built around political assassinations and their socio-political impact, with an initial framing focus on the assassination of President John F. Kennedy.² The logic of using a thematic case is two-fold. First, if the overarching theme is sufficiently interesting, students will be more likely to stay motivated. I conjectured that if I could get them interested in assassinations, then maybe I could “trick” them into learning about research along the way. Second, organizing the class around a theme or substantive topic makes the material less abstract and provides a framework within which material is contextualized (Leston-Bandeira 2013). Whether we were talking about theory or measurement, it was always with an eye toward the case, allowing students to make connections across class topics. Use of the thematic case, then, is a variation on problem-based

² Dr. John McAdams, Marquette University, teaches a social inquiry class organized around the Kennedy assassination that pre-dates mine. Our approaches are quite different, but McAdams’ syllabus and online resources are excellent. See: <http://mcadams.posc.mu.edu/home.htm> and <http://www.marquette.edu/polisci/documents/4191SyllabusMcAdams.pdf>.

learning, a pedagogical approach that assumes learning is enhanced when: 1) students have cues that activate and elaborate on prior knowledge, 2) information is organized around a cognitive “scaffold”, and 3) internal motivation is sparked (Schmidt 1993, 18, but see also Kirschner, Sweller, and Clark 2006). For the remainder of the essay, I discuss the organization of the class and student response to the approach.

Implementing the Case Study

Only 25% of PhD granting departments and 28% of departments overall in the United States require undergraduates to complete a research methods course (Parker 2010, but see also Thies and Hogan (2005)).³ The Department of Political Science at the University of North Texas is one such department. Undergraduates seeking a bachelor’s degree in political science must successfully complete PSCI 2300, Introduction to Political Research. It is described in the course catalog as follows: “Emphasizes the conceptual and analytical tools necessary for understanding research political science. Includes an introduction to statistical analysis and computer use.” This description does not preclude exposure to interpretive or qualitative research methods, but the tradition in the department has been to take a deductive, quantitative approach. I taught this class in spring 2017. Thirty-seven students enrolled in and completed the class; 33 students consented to participate in a Qualtrics survey at the end of the semester designed to measure student response to the thematic case approach. Survey protocols were approved by the University of North Texas’s IRB. Student demographic information and the survey instrument are provided in the appendix.

[Table 1 here]

³ Undergraduate methods training is more prevalent in Europe (Parker 2010).

I organized the course around a substantive case in an effort to better engage the students. The Kennedy assassination made for an especially engaging starting point given the enduring conspiratorial narratives surrounding the event. Moreover, I hoped that the University's proximity to Dallas would give the topic special resonance with the students. Any number of foci are possible, however. In the end of semester survey, students were asked to suggest alternative cases. Responses are provided in Table 1. While many students suggested conspiracy adjacent topics, such as the moon landing or Area 51, others suggested more traditional political science topics, such as elections or political stability.

[Table 2 here]

Using an historical event such as the Kennedy assassination as the initial framing focus for studying political science research methods presents a particular difficulty. It is important to start with a deep dive into the details of the case. For example, what was Oswald's background? What was the sequence of shots? What did the Warren Commission find? These are interesting questions, but they do not necessarily provide a good framework for teaching hypothesis testing. The course outline is provided in Table 2. As one can see, this material comprises Unit 1, where the focus was on inference informed by induction. This is a more extended discussion of induction than I would normally provide, but this change to the usual structure of the class provided a practical way to incorporate the assassination, and it was and is appropriate from the perspective of learning about inquiry and theory building.

As a class, we explored the facts of the case and practiced theory building based on discrete observations. In order to leverage our proximity to Dallas, the class took a field trip to the Sixth Floor Museum, which introduced students to the body of evidence surrounding the assassination, official interpretations of the evidence (e.g., the Warren Commission Report and the Report of the House Select Committee on Assassinations), as well as alternative conspiracy

based theories. The field trip took place on a Saturday and was required of all students seeking at least a B in the class. Ninety-seven percent of students agreed or strongly agreed that “[t]he class field trip to the Sixth Floor Museum made a positive contribution to my experience in the class.” Given this experience, and in combination with lectures and outside readings, students were required to evaluate the evidence and develop their own theories of the crime.

Units 2 and 3 transitioned away from the Kennedy assassination and explored assassinations and their socio-political consequences more generally. How do assassinations affect political stability? How do assassinations affect society? How do assassinations affect attitudes toward fallen leaders? Why are some people more likely to believe conspiracy theories than others? These questions provided the backdrop to discussions of measurement, research design, significance testing, etc. Unit 2 introduced students to the principles of deductive research. The first topic is conceptualization, where students learn about refining concepts for measurement and analysis. The reading assignment included a chapter from Pollock (2015) and an excerpt of Iqbal and Zorn (2008)’s article on the political consequences of assassinations. Students discussed the possible range of assassination after-effects, such as civil war and political instability. Then, taking a problem-based approach they worked in groups to identify how Iqbal and Zorn developed and operationalized their concepts and brainstormed other possible conceptual refinements. By tying this topic back in with the larger theme, students could get a more concrete sense of how researchers move from ideas to measurement strategies.

Next, the class discussed developing theories and hypotheses. The reading assignment supplemented Pollock with Oliver and Wood’s (2014) article on conspiratorial thinking and public opinion. Having discussed the meaning and importance of theory in lecture, the class mapped out Oliver and Wood’s theoretical argument that political cues and personal predispositions structure conspiratorial thinking. This allowed the class to reflect back on public

acceptance of the Warren Commission Report with a more theoretically informed sense of why the official narrative remains contested. When discussing research design, students read Esaiasson and Granberg's (1996) piece on attitudes toward Swedish Prime Minister Olof Palme before and after he was assassinated. The class considered whether the research employed an experimental or quasi-experimental design and why the authors has made specific design choices. Here again, the methods discussion fit within a thematic framework, allowing students to better contextualize what they were learning.

Students returned to the Iqbal and Zorn (2008) and Oliver and Wood (2014) articles in Unit 3, which focused on the use of statistics in analysis. Iqbal and Zorn reappeared when discussing statistical significance. Students were reminded of Iqbal and Zorn's theory, which is that assassinations produce instability, but the levels of instability vary with state characteristics. As a class, we carefully discussed Table 1 of their article, which provides *t*-tests for differences of means, comparing the levels of political unrest, instability, armed conflict, and internationalized armed conflict before and after assassinations in states with and without a formal succession mechanism. And when discussing bivariate and multivariate analysis, Oliver and Wood's data were used in class and for a homework assignment to walk students through the mechanics of running various statistical analyses in Excel.

Student Response

Absent a control group, it is impossible to truly assess the efficacy of the thematic case approach as compared to a more traditional approach. Most students, however, completed a survey providing their reaction to the class. For all of the apparent student dissatisfaction with the undergraduate research methods requirement, 72.7% of students either agreed or strongly that

“This class has made me more prepared for upper division political science classes.”⁴ There were no significant differences by class standing, final grade, or GPA. Agreement that the class leaves students more prepared to succeed in upper division classes is good news, but this may or may not be attributable to the thematic case approach. While students may seem dissatisfied during the class, perhaps they have a different perspective at the end of the semester.

[Figures 1 and 2 here]

Even so, Figures 1 and 2 demonstrate that students reacted positively to the thematic case approach. The majority—78.79%—liked that the class was organized around a case study, and 90.91% reported that the case study increased their interest in the material. In explaining why they liked or disliked the approach, one student responded that “I don't [like] case studies because I don't think that they are a good way to do science.” On the positive side, students remarked that the thematic case made the material less abstract, less boring, and provided a through line for the class. One student observed that “The case study helped apply the concepts we learned to real world situations”, while another noted that “It made it easier to understand the techniques & methods when you have an actual case to compare them too.” These were common refrains.

In explaining why the case study increased or decreased their interest in the material, one student who reported no effect on the level of interest explained that “At the time the material was taught I was more concerned about other classes.” Another student noted that they are more interested in policy. Still another noted that “I do not believe this event ever happened, so this course simply provided me different perspectives on how the matter is viewed.” Among those

⁴ Given that women (Bradley and Wygant 1998) and people of color (Onwuegbuzie 1999) experience different levels of statistics anxiety, I checked to see if there were significant differences in student assessment of the class based on these categories. None were found.

whose interest increased, explanations centered on making the material more relatable and more interesting. The following is a sampling of their comments in this regard. One student noted, “I love learning about conspiracies”; another observed, “The assassination always fascinated me and focusing on it helped me understand the concepts of the class.” Still another reported that “This case...provided real life examples of what political researchers can do in the field.”

Discussion and Conclusion

On balance, using a case as a thematic framework for the semester worked very well. My initial intuition was that student dissatisfaction with the research methods class was owed in part to a perceived disconnect between the methods class and the rest of the curriculum. By organizing the class around assassinations, I hoped to help students make the connection between the politics and science. Moreover, I hoped that an interesting case might keep students engaged, even while the underlying material might be considered dry. Student assessments of the approach support these expectations. Not only did it help me structure the class and select supplementary reading, but the students liked it. In their view, not only did the class leave them more prepared for advanced classes, but also *the thematic case aided in that outcome by keeping them engaged and making the material less abstract*. These findings are equivocal. Given the lack of a control group, it is impossible to compare levels of student satisfaction and success across different versions of course. Even so, the results provide a basis for future experimentation with this technique.

This approach did present a significant challenge. In dedicating the first three weeks of the class to the details of the Kennedy assassination and, by extension, induction, other material had to be cut from the course. The focus on inductive reasoning is justifiable, but one is making a choice between that and, say, research ethics or game theory or more time on multivariate analysis. These kinds of tradeoffs are always present, but using a single historical event as the

gateway to the class increases this tension (Bernstein and Allen 2013). Organizing around a policy area might be more fruitful, as students would not have to first immerse themselves in historical detail. This is not to suggest anything is wrong with historical analysis, it is just that it does not lend itself to traditional political science approaches to inquiry.

Kim Hill (2002, 113) observes that “[e]ven in leading research universities the undergraduate educational program concentrates on describing political institutions and processes and exploring selected political history and current political controversies. The scientific aspects of the discipline that form the professional work of the vast majority of research professors are taught in fragmentary, ad hoc, and rare bits and pieces.” If Parker (2010) is to be believed, far too many undergraduate political science majors have little to no idea what political scientists do for a living aside from teaching. Echoing the Wahlke Report, Hill calls for a reversal of this status quo. Even so, requiring an undergraduate methods course might not promote the kind of scientific literacy and sense of the discipline that Hill and the Wahlke Report call for if students think of the class as something to be borne and not an opportunity to learn their field. Finding better ways to teach this material is crucial to those ends, and the goal of this paper has been to contribute to that effort.

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Table 1. Student Suggested Cases

Watergate	The September 11, 2001, terror attacks
Aliens/Area 51	LGBT rights
Princess Diana's death	A presidential election
The assassination attempt on Ronald Reagan	A policy or legislative issue
Immigration	The Iraq War
Political stability	Bill Clinton's impeachment
Moon landing	OJ Simpson's murder trial
Birthrates and population related issues	Martin Luther King, JR, assassination

Table 2. Course Outline and Reading Assignments

1 Scientific Approaches to Politics

- Pollock, Introduction

Unit 1: Inductive Approaches and Theories of the Crime

2 What Happened in Dallas?

3 Conspiracy Theories

- McAdams, John. 2014. "A Universe of Conspirators." In *Kennedy: His Life & Legacy*. Ed, Ben Nussbaum. Irvine, CA: i5 Press, pp. 78-85.
- Krock, Arthur. 1963. "The Intra Administration War in Vietnam." *New York Times*, October 3.
- HSCA, pp. 95-99
- Marrs, James. 2013. *Crossfire: The Plot that Killed Kennedy*. New York, NY: Basic Books, pp. 127-148
- Shenon, Philip. 2015. "Yes, the CIA Director Was Part of the JFK Assassination Cover-Up." *Politico*, October 6.

4 Field Trip: Sixth Floor Museum

5 Evaluating Competing Evidence

- Spiegelman, Cliff et al. 2007. "Chemical and Forensic Analysis of JFK Assassination Bullet Lots: Is a Second Shooter Possible?" *The Annals of Applied Statistics* 1(2): 287-301.
- Thomas, DB. 2001. "Echo Correlation Analysis and the Acoustic Evidence in the Kennedy Assassination Revisited." *Science & Justice* 41: 21-32.
- Myers, Dale K. 2004. "Badge Man: A Photogrammetric Analysis of Moorman Photograph No. 5 of the JFK Assassination": <http://www.jfkfiles.com/jfk/html/badgeman.htm>.

Unit 2: Deductive Approaches and Implications of the Crime

6 Conceptualization

- Pollock, chapter 1
- Iqbal, Zaryab, and Christopher Zorn. 2008. "The Political Consequences of Assassination." *Journal of Conflict Resolution* 52(3): 385-390.

7 Measuring Variables

- Pollock, chapter 2
- Sheatsley, Paul B. and Jacob J. Feldman. 1964. "The Assassination of President Kennedy: A Preliminary Report on Public Reactions and Behavior." *Public Opinion Quarterly* 28(2): 189-202.

8 Developing Theories and Hypotheses

- Pollock, chapter 3
- Oliver, J. Eric and Thomas J. Wood. 2014. "Conspiracy Theories and the Paranoid Style(s) of Mass Opinion." *American Journal of Political Science* 58(4): 952-955.

9 Research Design and Control

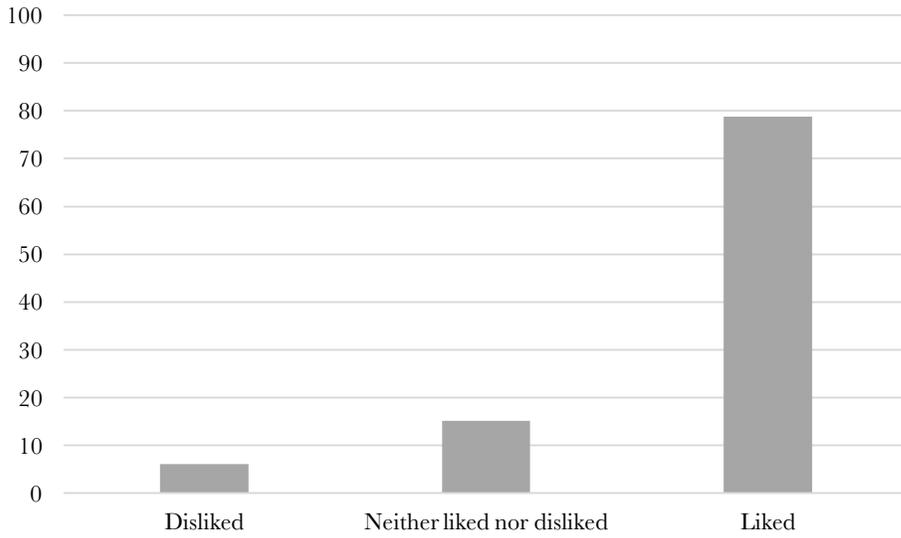
- Pollock, chapter 4

- Esaiasson, Peter and Donald Granberg. 1996. "Attitudes toward a Fallen Leader: Evaluations of Olaf Palme before and after the Assassination." *British Journal of Political Science* 26(3): 429-439.
- 10 Making Comparisons, Thinking about Relationships
- Pollock, pp. 102-118

Unit 3: Statistical Techniques for Inference

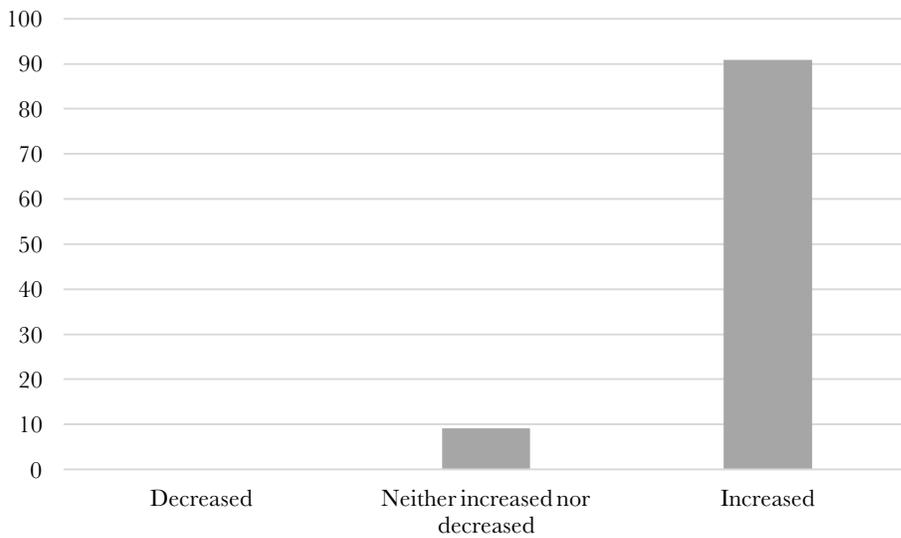
- 11 Sampling and Statistical Inference
- Pollock, chapter 6
- 12 Effectively Communicating Research Results
- 13 Significance and Association
- Pollock, pp. 156-170
 - Iqbal and Zorn, pp. 390-391
- 14 Bivariate and Multivariate Relationships
- Pollock, pp. 188-198
 - Oliver and Wood, pp. 959-962
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Figure 1. Student Response to the Case Study Approach



Question wording: “On balance, did you like or dislike that the class was organized around a case study?”

Figure 2. Effect of the Case Study on Student Interest in the Material



Question wording: “This class focused on a case study—the Kennedy assassination and related empirical puzzles. Do you think this approach increased or decreased your interest in the material?”

Appendix

Table A1. Class Demographic Information

<u>Class standing</u>			<u>Gender</u>	
Freshman		12.12% (4)	Male	66.67% (22)
Sophomore		27.27% (9)	Female	33.33% (11)
Junior		39.39% (13)		
Senior		21.21% (7)	<u>Race/Ethnicity</u>	
			White	48.48% (16)
			African American, Black	21.21% (7)
			Asian	3.03% (1)
			Latino/a, Hispanic	21.21% (7)
			Middle Eastern, N. African	3.03% (1)
			Other	3.03% (1)
<u>Final grade distribution</u>				
	<i>Anticipated</i>	<i>Actual</i>		
A	42.42% (14)	42.42% (14)		
B	30.30% (10)	21.21% (7)		
C	24.24% (8)	15.15% (5)		
D	3.03% (1)	15.15% (5)		
F	0% (0)	6.06% (2)		

Survey Instrument

Are you currently or do you plan to become a Political Science major?

- Yes
- No
- Don't know

Are you currently or do you plan to become a Political Science minor?

- Yes
- No
- Don't know

Are you currently or do you plan to become a History major or minor?

- Yes
- No
- Don't know

What is your class standing?

- Freshman
- Sophomore
- Junior
- Senior
- Other

What is your gender?

- Male
- Female
- Non-binary
- Prefer not to say

What grade do you anticipate receiving in this class?

- A
- B
- C
- D
- F

What is your grade point average?

- 3.0-4.0
- 2.0-2.99
- Below 2.0

What is your age?

- 18-24 years

- 25-34 years
- 35 years and above

With which racial or ethnic group do you most identify?

- African-American or Black
- Native Hawaiian or other Pacific Islander
- White
- Latino/a or Hispanic
- Native American or Alaska Native
- Middle Eastern or North African
- Asian
- Other

This class has made me more prepared for upper division political science classes.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Before taking this class, I knew a great deal about the assassination of President Kennedy.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

This class focused on a case study—the Kennedy assassination and related empirical puzzles. Do you think this approach increased or decreased your interest in the material?

- Increased interest
- Neither increased nor decreased interest
- Decreased interest

Please explain your answer to the previous question.

On balance, did you like or dislike that the class was organized around a case study?

- Liked
- Neither liked nor disliked
- Disliked

Please explain your answer to the previous question.

If an instructor were to organize the class around a different case study than the Kennedy assassination, what theme would you suggest?

The class field trip to the Sixth Floor Museum made a positive contribution to my experience in the class.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your answer to the previous question.

Please provide additional feedback or comments on the class and its focus on the Kennedy assassination and related empirical puzzles.