An Undergraduate Degree in 'Data for Political Research': High in Demand and Student Value but Low in Supply

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ABSTRACT Political science is useful for many things but especially for the suite of research methods that we teach our students that generalize to a wide range of careers. However, that training is often buried deep in the major and is not well integrated into further coursework except perhaps for senior research. In reaction to that model, we started a new program that frontloads quantitative research methods, beginning with data visualization and then modeling following an inquiry model. With their newfound independence, students are able to approach substantive upper-level courses ready to engage the worth of theory by evaluating and updating their empirical tests. This article describes the program and reports on survey results from a 2024 sample of political scientists that reveals broadscale support for the program and its operating assumptions.

A quantitative-forward approach to undergraduate political science training is a popular idea and one that many scholars believe would provide value for students. Others argue that such a program also would capture runoff from the STEM (Science, Technology, Engineering, and Mathematics) "leaky pipeline" by offering training in STEM that attracts a set of students more diverse than which typically selects into the field (Mueller 2023). However, a quantitative-forward approach to teaching political science at the undergraduate level in the United States remains rare (Parker 2010), although it may be growing in the United Kingdom (Rosemberg et al. 2022). To build a case for this type of program, we discuss our experiences in running a new quantitative undergraduate political science program called Data for Political Research (DPR). We summarize recent survey data of political science faculty members that reveal substantial support for this approach, and we provide other evaluation data that bear on the program.

We believe a program like DPR is valuable for two reasons. First, the mainstream approach leaves new graduates underprepared for the rigors of quantitative training in master- and doctoral-level programs in political science. A typical empirical political scientist regularly uses quantitative methods to find answers to complex and weighty problems in politics and society. In a single research project, a political scientist may act as the data engineer, data analyst, data scientist, and computer programmer. Many undergraduates are unprepared for this reality, entering graduate school ignorant of it. In addition to graduate pursuits, there is an instrumental value of quantitative training that has been linked to higher-grade attainment in other coursework (Eick et al. 2021).

Second, many of the skills required for conducting mainstream empirical research in political science also are required for a host of datacentric careers outside of academia. Many think tanks, non-profits, and government agencies are experiencing increased demand for those who have competent training in research design and statistical analysis. Of course, there also is a range of data-science roles in the private sector. However, not only are typical undergraduate students in political science unprepared for the quantitative aspects of graduate-level training, they also are unqualified to pursue the growing numbers of datacentric career opportunities outside of academia. This is unfortunate because

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these types of positions are increasing (Bureau of Labor Statistics 2023) and private-sector analogs of political science research are strong. Much private-sector research involves studying human behavior because it intersects with programs and offerings that parallel institutions and candidates. We must think carefully about data quality and how to adequately measure complex concepts and find appropriate models for the particular question.

a recent survey of political science faculty. Our analysis of the data shows supermajority support for a program such as DPR and agreement that it would be beneficial for students.

THE STRUCTURE OF DPR

The DPR program has an inverse structure. Whereas many political science curricula offer a methods course toward the end of the

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Even in careers that are not datacentric, having training in data collection and analysis enables students to engage with coworkers and data-driven materials, giving them an advantage over their peers (Van der Meer and Marks 2016). Indeed, in a sizable program to encourage greater quantitative training across 18 UK universities, the Q-Step initiative was successful in boosting employment and earnings among participants (Rosemberg et al. 2022).

Currently, many political science undergraduate students must double major in a secondary field that provides quantitative training to prepare them for graduate school, a datacentric career in policy, or the private sector. This solution elides the fact that substantive training in the theories and issues that concern political scientists provides opportunities for applied research that students may not have with a traditional STEM degree. In practice, this means that students may not have an opportunity to integrate the technical skills they are learning with the applied problems of politics and policy.

We have experience with another approach: teaching undergraduate courses in politics in which exposure to data analysis happens from the beginning with quantitative training and application integrated throughout the curriculum. Although our program is relatively new, we already have observed evidence of its potential to overcome the shortcomings in the conventional approach to undergraduate training in political science mentioned previously. Our students obtain applied experience using data and computer code for data visualization and modeling, and they are given ample opportunities to practice asking research questions, putting forward theories, testing hypotheses, and writing about their analyses for various audiences.

We also have witnessed firsthand the potential of quantitative training in political science to fix the STEM leaky-pipeline problem: that marginalized communities tend to select out of it. As Mueller (2023) argued, a quantitative emphasis in undergraduate political science training can attract individuals who are intimidated by or otherwise uninterested in stereotypical STEM degrees. In addition to being new, our program at a liberal arts college is small; however, a substantial proportion of our students are female and minority racial groups, which supports Mueller's (2023) argument.[1]

The following sections further develop our case for a quantitative-forward political science curriculum. We begin by discussing the structure of our DPR program and how it integrates quantitative training with exposure to theories and issues in politics and policy. We then take a broad view of attitudes and beliefs regarding a DPR-style program, summarizing responses to

major (often as a precursor to senior research), we begin with methods—specifically, data visualization (Rom 2015). This course introduces students to coding, use of the R programming language, introductory notions of research design, and writing to evaluate evidence beyond making arguments. This is embedded in substantive and diverse political inquiries (Gunn 2017) that engage different data structures (i.e., aggregate cross-section, survey, and time series). Students write mini-research papers for each section and compete for the V. O. Key Data Visualization Award presented each semester.

Subsequent courses build on this foundation to work on students' writing for public audiences in "Writing with Data in the Public Interest" and their research design and data-modeling skills in "Design and Data Analysis for Social Impact." "Writing with Data" explores how to write about scientific findings for public audiences while considering their needs and knowledge. It also promotes a more robust notion of writing as a process and targets peer-reviewing skills. With a focus on causal inference, "Design and Data Analysis" introduces students to ways they can use modeling to describe trends, make predictions, and identify causal relationships in the context of questions about elections, human rights, and policy evaluation.

After these core introductory courses, DPR students take a selection of upper-level courses, all of which involve quantitative research (i.e., the program mandates that half of the assignments be quantitative for inclusion). Upper-level courses have varied structures. In a "Loneliness and Politics" seminar, participants discuss the literature, from theory to empirical work, for almost two months before shifting to independent, quantitative research projects that they regularly report on to the class. Some used loneliness as the dependent variable, while others used it as an independent variable. The "Death, Destruction, and Data" course exposes students to theories of international conflict and uses workhorse peace science datasets and models for testing theoretical claims. The course is structured such that students are exposed to a new theoretical argument about why wars happen followed by technical instruction in datasets and variables from the conflict literature relevant to testing the theory. Students have weekly mini-analysis challenges and a final research project to conclude the course.

We found that students were eager to practice their skills and enjoyed the level of contribution they could add to the class discussion as a result of conducting regular, guided, independent research. We also encountered our students who wanted to add quantitative elements into other coursework, asking for help in sourcing data or for visualization consultations. Moreover, it is

common for our students to write for our university-focused blog that takes advantage of a semesterly survey of students with crowdsourced survey content.[2]

Our program is relatively new so it has not yet undergone a formal program evaluation, which at this time makes providing a comprehensive assessment of DPR impossible. However, in the few semesters' worth of course evaluations that we have accumulated so far, we observe clear evidence that students have received from the program what we hoped they would. Approximately 70% of students in our data visualization and research design courses gave a 5/5 rating for knowledge gained and course effectiveness. In their open-ended responses, for which we used a Large Language Model (i.e., GPT-4.1) to help us summarize, students frequently mentioned that they gained practical, transferable skills in R, data visualization, and political analysis. Several students also appreciated how political content was embedded in technical assignments, which helped them to stay interested and motivated—even when encountering technical difficulties. Most of the negative comments or suggestions for improvement centered on lecture pacing and the speed of introducing complex topics. Furthermore, some students would appreciate more critical evaluation of the datasets that we use. These are all good suggestions as we make adjustments semester by semester. The overall assessment from students, however, has been overwhelmingly positive.

DATA

We compiled survey data from a sample of political scientists who were presented with details of a DPR-like program. The survey was conducted by one of the authors in late May–early June 2024. The sampling procedure followed what was used by Djupe, Smith, and Sokhey (2022): sampling half of American Political Science Association (APSA) member departments and then conducting a census of all faculty members; exceptions were made for emeriti, courtesy appointments, and short-term appointments (if possible).[3] This process yielded 4,025 email addresses (134 bounced): 996 respondents started the survey, partial responses were received from 865 and, after two reminders, 637 provided complete responses for a 16% response rate. This distribution was close to the APSA proportion of women (i.e., 36% versus 39% in August 2022) but had a higher proportion of whites (i.e., 82% versus 71% of American APSA members), too many full professors (47%), and 66% working in PhD programs. Only a slight majority of respondents indicated that their research is primarily quantitative (50.3%), whereas the remainder followed diverse methodologies: qualitative (30%), ethnographic (5%), interpretavist (8%), and normative (6%). It was difficult to know whether this was the true distribution; however, one vote of confidence came from comparison with Djupe, Smith, and Sokhey's (2022, 51) survey evidence from 2017: the two distributions were almost identical. Although we provide only this one review of the sample, the most appropriate use is to examine support within various groups of respondent faculty members—by gender, race, age, rank, and institution (Djupe, Smith, and Sokhey 2022). We used data from the APSA membership dashboard[4] (limited to Americans) to compose weights for race, gender, and field of study. We used the weights although they did not substantially change the results.

RESULTS: SUPPORT FOR DPR

Late in the survey, we asked respondents, "We're interested in your views about teaching quantitative methods to undergraduates. Please consider this proposal about a new major design: Students would take a sequence of two courses in (1) data visualization and (2) design and data analysis (modeling) before taking a range of substantive courses. A significant portion of those upper-level courses across subfields would involve student research engaging debates in the literature with appropriate (mostly professor-supplied) data." Figure 1 shows broadscale support in

Figure 1
There Is Widespread Support for a DPR, Methods-Forward–Style Major
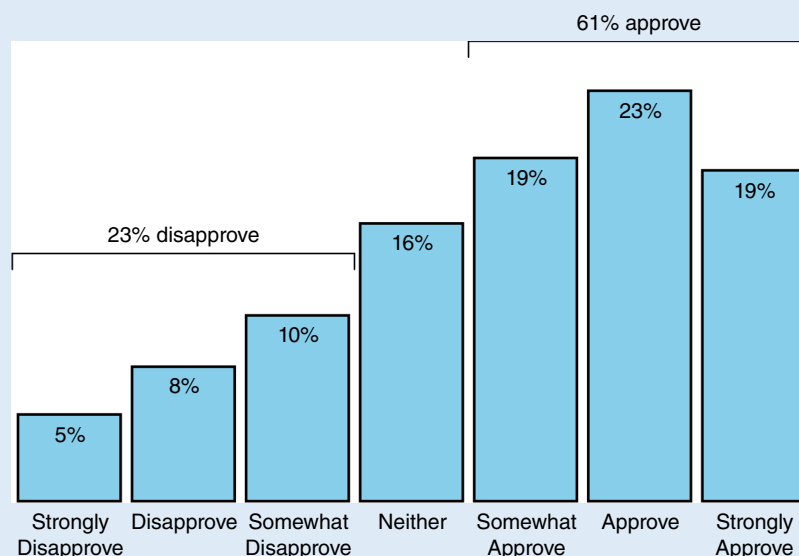
this sample, in which only 23% disagreed, 16% were on the fence, and the remaining 61% expressed some form of agreement. Notably, this percentage in agreement was greater than the percentage of the sample that self-described as quantitative (50.3%). The survey followed this general-support question with a short battery of beliefs that might trigger support or opposition.

We asked about a range of beliefs that address pedagogical benefits and program costs that we suspected might be linked to the implementation of a DPR-style program. Figure 2 shows agreement (smoothed) with these beliefs organized by their

DPR support was not strongly linked to the remaining beliefs. Those who approved of the program showed modestly more agreement that it would help to fix the STEM leaky pipeline. Everyone agreed, on average, that methods should be taught within the home program rather than being outsourced. Moreover, those who approved of the DPR program tended to disagree that it should be limited to a minor, but they were only equivocal about whether it would drive students away—most tended to agree with that belief. The levels of approval/agreement observed were likely to fluctuate in other samples, but we suspect that the

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DPR support. The results suggest that the most potent dividing line is drawn by how we think that the program is linked to core learning goals. Those who approved of the program perceived it as "boosting critical thinking and independence in our students," whereas those who disapproved disagreed with that belief. Of course, one reason that we pursue these learning goals is that we think they will help students obtain good jobs; therefore, the disapprovers naturally also disagreed (although they disagreed at a much weaker rate than the approvers agreed).

relationships between program approval and belief agreement are more enduring.

RESULTS: WHO SUPPORTS DPR

One of the essential analyses to conduct is whether approval of the DPR program is limited to particular corners of the discipline outside of the methodological specialty. It is unsurprising that those who use quantitative methods in their work tended to favor this program, whereas qualitative faculty members were leaning

Figure 2

How Support for DPR Is Linked to Beliefs About the Program

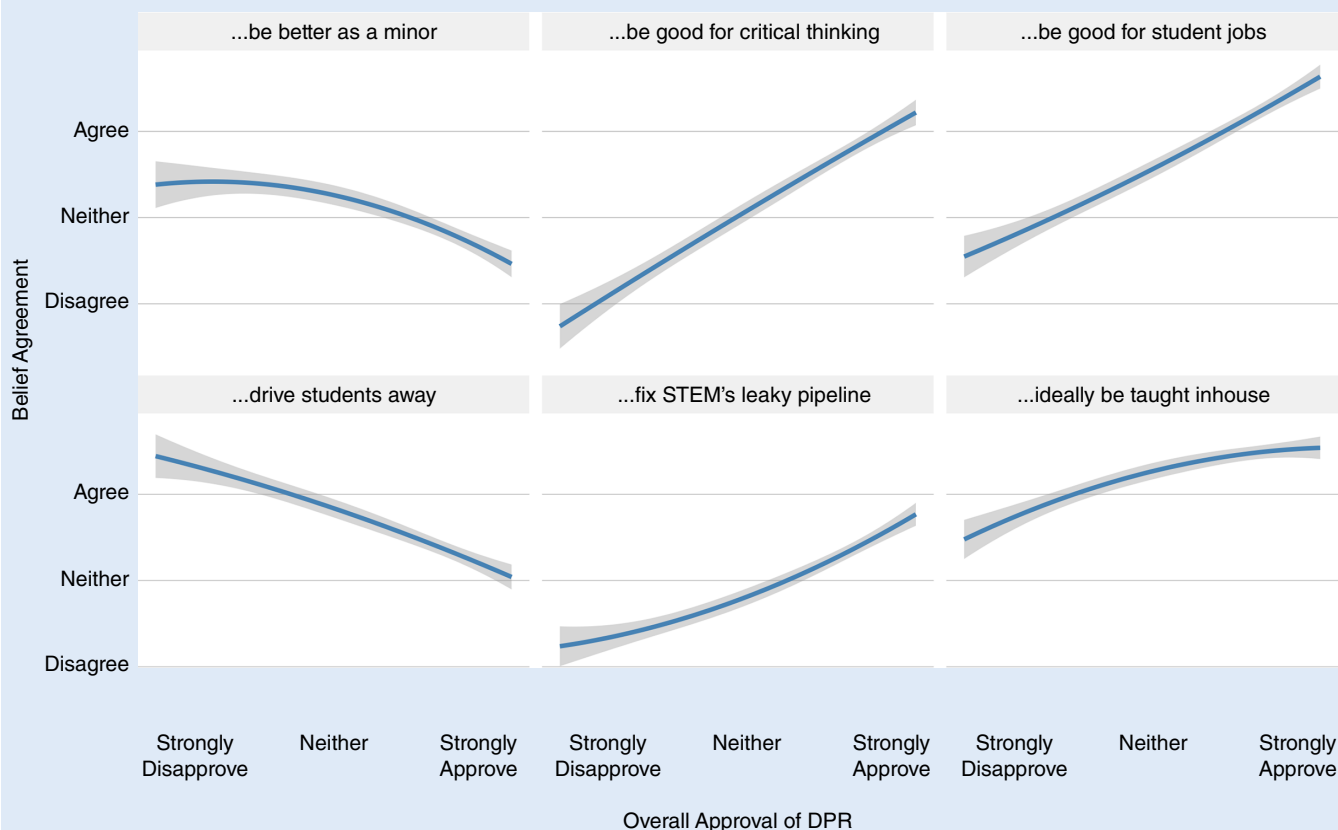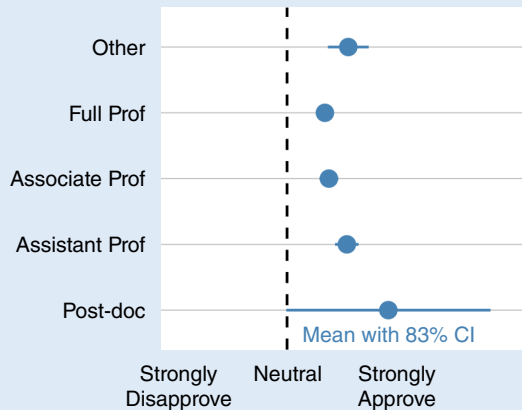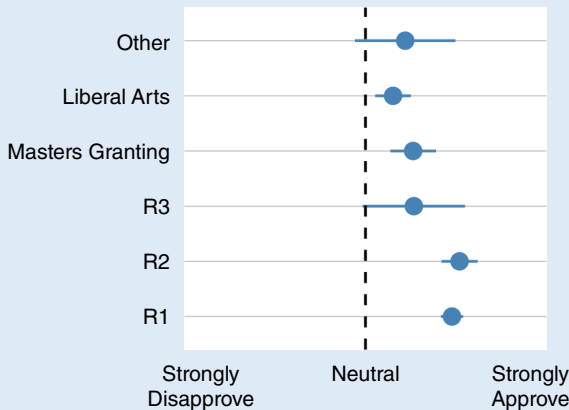Respondent agreement with the idea that DPR would...

Figure 3

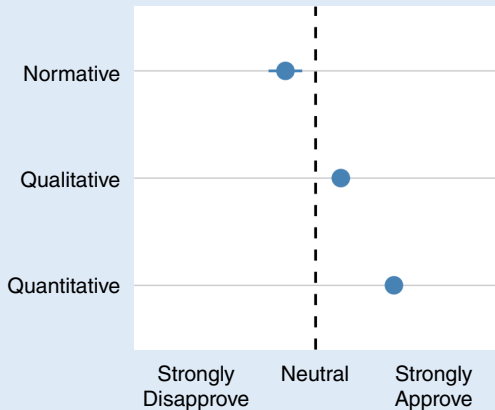## Support for DPR Shown by Faculty Institutions, Research Methods, and Demographics
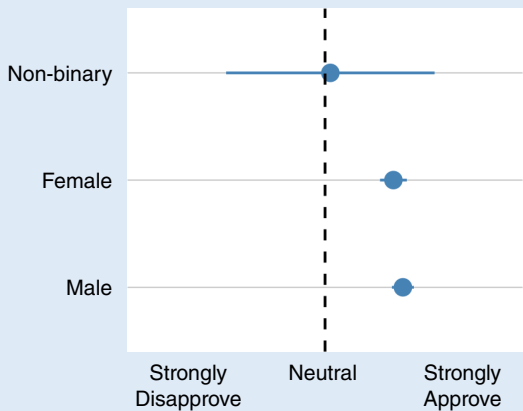

Support for DPR by academic position
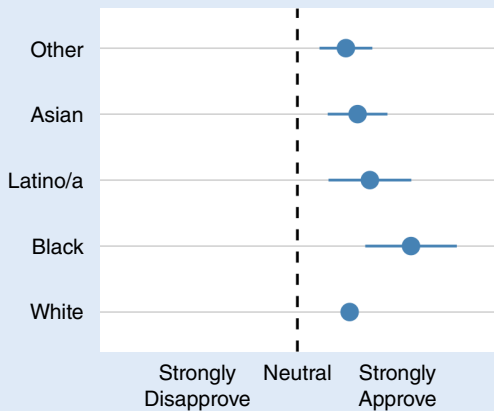
Support for DPR by academic institution

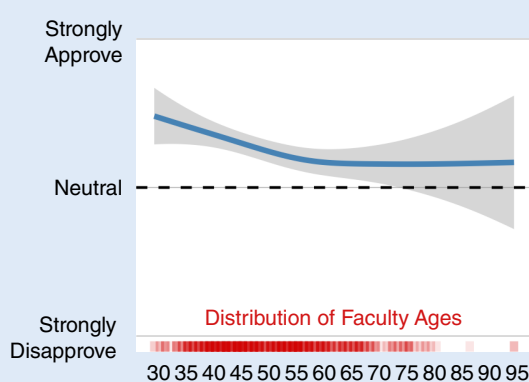**Support for DPR by research method**

Support for DPR by gender

Support for DPR by race

Approval for DPR by age

toward approval, and normative scholars tended to disapprove. We did not expect much difference across the discipline because the methodological specialty simply does not differ greatly by race, gender, or rank. In these data, 3% more men than women specialized in quantitative methods, and whites were less than 4% more likely to be quantitative than nonwhites (58% versus 54.5%). We observed larger gaps between institutions: 15% more faculty members at PhD-granting institutions were quantitative versus others (63% to 48%). Moreover, full professors were less likely to be quantitative (55% versus 66% among assistants), indicating a discipline that is shifting toward greater use of quantitative methods.

With these distributions in mind, it is unsurprising that the model results in figure 3 show widespread support with only a few small differences. Men supported DPR only modestly more than women. Black faculty members showed somewhat greater support levels, although support across all racial groups was in a tight, indistinguishable pack. Only when we turned to differences across rank did we observe increased approval among assistant professors compared to full professors. We observed the same modest slide as faculty age: older faculty members supported DPR at lower rates. Likewise, average approval was strong across institutional types. Faculty members at liberal arts colleges approved at the lowest rates (although they still leaned toward approval), whereas R1 faculty members were the most robust in their approval.

CONCLUSION

Frontloading research methods will not be appropriate for every program. However, there is widespread support for trying such a program among a broad range of political scientists across institution types and especially among younger faculty. Support is premised on an affinity for the particular set of research methods, which does not preclude others but also is buoyed by the belief that learning and practicing these skills and mindful habits will foster

its utility for students and its ability to attract students who otherwise might select out of STEM. Furthermore, the resources available for making quantitative methods a cornerstone of undergraduate political science are abundant. Taken together, the payoffs far exceed the costs for implementing a DPR-like program.

Perhaps the primary lingering issue that needs to be addressed is the concern that a DPR-like program would drive students away from a political science degree. Although our new program offers only one datapoint, we have not experienced this problem. Anecdotally, many students expressed gratitude for the opportunity to use data to test assertions and build evidence addressing important societal and political issues they care about. Some ambitious students did their best to merge normative theory and concerns with data analysis in creative and compelling ways. Making quantitative methods and research more central to undergraduate political science creates space for growth, critical thinking, and creativity. For this reason, it can attract students rather than turn them away.

DATA AVAILABILITY STATEMENT

Research documentation and data that support the findings of this study are openly available at the *PS: Political Science & Politics* Harvard Dataverse at https://doi.org/10.7910/DVN/NVYHZL (Djupe and Williams 2025).

CONFLICTS OF INTEREST

The authors declare that there are no ethical issues or conflicts of interest in this research. ∎

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learning outcomes we care about. Learning to question the empirical foundations of assertions and having the wherewithal to know how to test them independently is a phase change in critical-thinking skill development.

Many other developments enable such a change and underwrite what in decades prior would have been considerably expensive. We currently have access to free statistical software (i.e., R or Python) that also happen to be industry standards. Numerous free support publications are available free online; multiple texts by social and political scientists are pitched at multiple levels (Bailey 2020; Bueno de Mesquita and Fowler 2021; Imai and Williams 2022) and toward particular activities (e.g., visualization; Healy 2019); the support community through Stack Overflow and elsewhere is robust; and the social science user base is broad.

In summary, there is supermajority support for an undergraduate program such as DPR that frontloads quantitative methods training. Our experience with the program confirms

NOTES

1. The campus is 52% women and the DPR program has consistently averaged approximately three-fifths women (currently 57%).
2. See http://onetwentyseven.blog.
3. The survey was reviewed and deemed exempt by the Denison University Institutional Review Board (IRB). We obtained informed consent in the first question of the survey: respondents' agreement with the statement that presented information relevant to the three main principles of IRB review (i.e., respect for persons, beneficence, and justice). None of the respondents were paid, the sample was reasonably as diverse as political science within faculty roles, and the participants would not reasonably be considered vulnerable.
4. See https://apsanet.org/RESOURCES/Data-on-the-Profession/Dashboard/Membership.

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