

The Stewardship Model: An Inclusive Approach to Undergraduate Research*

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Abstract

The field of social science lacks diversity, in both academia and industry. One cause is the pipeline problem. Too few students from diverse backgrounds—notably, first-generation college students and students of color—pursue social science undergraduate and graduate degrees. And, those who do are disproportionately likely to exit their respective fields. In response to these twin institutional failures, we have developed a new model of mentored undergraduate research experiences, the Stewardship Model of Mentoring, designed to enhance the presence and status of social scientists from diverse backgrounds through targeted recruitment, technical training, and multi-level mentoring. In this article, we detail the theory and practice of the Stewardship Model within our collaborative research laboratory, and we invite scholars to join a newly-piloted multi-institution survey effort to assess the effects of this and other undergraduate research experiences on the attitudes, skill development, and psycho-social well-being of students from a range of backgrounds.

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Introduction

As members of the professorate, we occupy spaces that are rarely diverse, inclusive, or accessible, and current practices for training social science researchers reproduce the status quo. Too few students from diverse backgrounds—notably, first-generation college students and students of color, but also women—enter the training pipeline early in their college careers (Schultz 2011). And, those who do enter are disproportionately likely to exit (Monforti and Michelson 2008). These twin institutional failures yield cohorts of newly-trained social scientists that are persistently less diverse than they could be.

In response, we have developed a new model of mentored undergraduate research experiences (UREs), the Stewardship Model of Mentoring, designed to recruit, train, mentor, and support a diverse new generation of social scientists. We practice the Stewardship Model because none of us could have joined the professorate without substantial investments in our professional development, growth, and success. We recognize that we must be good stewards of these investments, not only multiplying them in the next generation, but also dispersing them more widely.

In this article, we detail the theory and practice of the Stewardship Model within the Security and Political Economy (SPEC) Lab, a research and mentoring organization at the University of Southern California. The SPEC Lab conducts research on issues at the intersection of climate change, security, and economic development, and is led by three faculty Principal Investigators (PIs) and a graduate student Director. Our mission is to recruit students from diverse backgrounds, train them in data science and other social science research skills, and support them as they plan for and begin their careers in academia, government, non-profits, and industry.

The SPEC Lab is undergraduate-focused, currently serving roughly forty undergraduate students and a small group of Ph.D. students. The Lab's faculty and Ph.D. students are political scientists by training, but our research is interdisciplinary and our undergraduate research assistants and faculty collaborators hail from a range of academic disciplines, including Economics, Philosophy,

Computer Science, and foreign languages. While these fields face their own diversity challenges, which we help address in part through our work, the Lab's greatest impact is likely on the International Relations subfield of Political Science, where our core expertise lies. The SPEC Lab is located at a large R1 institution; however, its mission and organizational principles are adaptable to a range of institutional contexts. Key features of the Lab—for example, for-credit research experiences—travel well to teaching-focused institutions and faculty mentors with higher course loads.

The pedagogical approach employed by the SPEC Lab, which we refer to as the Stewardship Model, is specifically designed to build diversity in the social science talent pipeline. The model combines five key elements: (1) targeted recruitment, (2) technical training, (3) applied research experience, (4) multi-level mentorship, and (5) membership in a carefully-constructed learning community. Collectively, these five practices allow us to recruit diverse students who may not initially consider a career in social science possible and provide them the tools and support necessary to thrive as researchers and professionals.

After describing the principles of the Stewardship Model and its implementation, we discuss strategies for adapting the model to a range of institutional contexts and outline an ongoing multi-institutional, mixed-method study of the short- and long-term effects of UREs. We describe steps faculty members can take to both participate in this study and join a community of faculty working to provide mentored research experiences to their students.

The Stewardship Model of Mentoring

The Stewardship Model draws on research on best practices for mentored UREs (see, for example, Shanahan et al. 2015) to design an approach that addresses the unique needs of diverse students. Research in the education literature has shown that sustained mentorship that addresses academic, professional, and psycho-social needs is critical to student success in UREs (Lopatto 2003). Fostering

relationships that go beyond strictly research-based interactions is particularly important for students from underrepresented backgrounds (Chemers et al. 2011; Ishiyama 2007). An understanding of the importance of holistic mentorship has guided our practice, which we have developed iteratively over time. Thus, the following sections describe both the abstract principles of the Model and the details of their application in our particular lab.

Targeted Recruitment

The Stewardship Model begins with proactive, targeted recruitment of diverse students. Prior research finds that stereotype threat and related issues can deter even highly-qualified students from underrepresented groups from seeking competitive opportunities (Steele and Aronson 1995). Relatedly, our subfield, International Relations, lags behind other subfields in political science in terms of the presence and status of scholars of color. As of 2019, black and Latinx scholars represent just 8% of IR scholars in the United States, compared to 12.5% in comparative politics and 14% in American politics (American Political Science Association 2019). This means that underrepresented students in IR are less likely to see people like them on course syllabi or at the front of the classroom. As a consequence, diverse students are less likely to feel welcome and included, and less likely to specialize in IR, at either the undergraduate or graduate level. This has follow-on effects beyond the professorate, contributing to the lack of diversity amongst international affairs practitioners (Center for Strategic and International Studies 2018). The less diverse a particular field is, the more important targeted recruitment becomes for labs working in that area.

In addition to standard advertising of open positions on university-wide listservs and websites, faculty and student members of the SPEC Lab intentionally seek out students from diverse backgrounds—in courses, residential education, advising hours—and encourage them to consider participation, irrespective of previous experience. Faculty have also connected with our university's Office for Diversity, as well as black and Latinx student groups on campus, to spread the word about

the Lab. Since many students from diverse backgrounds must pursue paid employment opportunities to meet their financial needs, we have also worked with our university's Financial Aid Office to recruit and pay students through the Federal Work-Study program. These recruitment practices facilitate diverse students' entrance into the pipeline.

Training and Professionalization

Undergraduates arrive on our campuses with great variation in their academic backgrounds and technical tool-kits. For this reason, we take a developmental approach to training, emphasizing the acquisition of skills over time. This increases accessibility of UREs for students who may not have had the same level of preparation and encourages retention of students who may initially feel discouraged by the demands of research.

To prepare students for mixed-methods research, the SPEC Lab trains students in three areas: (1) statistical computing and applied data science, (2) qualitative research design and process-tracing, and (3) scientific communication.¹ Our trainings are offered via several avenues: semi-regular workshops run by doctoral students and senior undergraduate lab members, a pair of year-long for-credit courses, and student-run office hours to support students' self-study. By offering a variety of training contexts, we accommodate a range of student interests and time constraints. We encourage participation by allowing all (non-credit-bearing) training time to count as working for the Lab. The materials from our in-lab trainings and syllabi for credit-bearing courses are available in supplementary appendix A.

Rather than teach statistics, which is easily available via for-credit courses outside the Lab, we focus on applied skills—for example, data management and visualization—that are often omitted from formal curricula in quantitative methods courses. We aim to prepare students for the non-

¹ Those working in other subfields and academic disciplines might adapt the focus of their training in order to best equip students for graduate and professional work in their area.

academic job market as well as for graduate school, and thus we developed our research design and data science curricula based, in part, on feedback from private-sector employers. We also train students to translate and disseminate social science research findings for broader audiences, involving them in the creation of written work for dissemination via blogs, as well as explainer videos and comics. Senior members of the Lab, who have excelled in their team's work, are offered the opportunity to co-author op-eds with faculty PIs or participate in regional and national conferences in our field.

Applied Research Experience

Instruction and application occur simultaneously in the SPEC Lab. Students work in teams on faculty research projects related to urgent social problems. Research teams generally consist of a faculty PI, a Ph.D. student advisor, an undergraduate student team lead, and three to six other undergraduate researchers. This team-based approach is critical for retaining diverse students, as it allows them to develop a research community and network of support.² Muddling through a complex research problem as a group normalizes seeking help from and giving help to others, and reframes research as a process of communal discovery.

While working with the faculty PIs, members of the Lab see the different phases of a research project and are actively involved in executing them. Faculty PIs and Ph.D. student advisors emphasize the connection between weekly tasks and the 'big picture' of how those tasks contribute to the larger project. Students who participate in the Lab for multiple years may see a project move through the entire process. This increases student 'buy-in' and encourages retention of undergraduate researchers.

² Psychological research suggests that students with lower socio-economic status respond more positively to communal framing of tasks (Stevens, Markus, and Townsend 2007).

Multi-Level Mentoring

We strive for independent, supported work in which each student has a high degree of autonomy in completing their tasks, but also has access to several layers of support to navigate obstacles. Each lab member has access to three primary mentors: a faculty PI, a doctoral student, and an undergraduate team lead. We elaborate on these roles and relationships below. Becker and Zvobgo (2019) also provides an overview of the mentoring philosophy of the Lab, which discusses at greater length our support for students' academic development and their psycho-social well-being. This mentoring strategy is critical to the success of the Stewardship Model, as research suggests that students from diverse backgrounds place more value on mentoring relationships that incorporate their emotional and social needs (Ishiyama 2007).

Peer Mentors. As students accumulate skills and experience through work in the Lab, they take on additional responsibilities for training and mentoring others. Skill-intensive tasks are assigned to pairs in which a new student “rides along” on the more technical aspects of the task, learning by collaborating. The undergraduate team lead—a returning student who has earned promotion through demonstrated excellence—also provides mentorship to their colleagues. The team lead coordinates day-to-day project management, ensuring team members have a clear understanding of their tasks, meet their deadlines, and have access to the necessary support, mentorship, and training.

Faculty Mentors. By empowering student leadership, faculty members can limit the time demands of lab management. However, there are no shortcuts in mentoring; students thrive on one-on-one faculty attention (Shanahan et al. 2015). Students are required to meet with their faculty PI twice per semester to discuss their progress and plans. In addition, to the extent that students are able to

complete at least some of their work in physical proximity to the faculty member, it enables relationship development and micro-doses of mentorship that are cumulatively powerful.

Graduate Near-Peer Mentors. Ph.D. students in the SPEC Lab serve a role very similar to the one filled by the PIs, directing research projects and working with the PIs to design and teach lab training modules.³ However, graduate students can often provide ‘best-of-both-worlds’ mentoring, relating easily to student experiences as near-peers, while still leveraging advanced subject-area expertise.

Building a Learning Community

Multi-level mentoring is a key tool in achieving a broader goal: a holistically supportive learning community. Within this community, students have a safe space to work, numerous role models from their own and other under-represented groups, and a clear path for leadership advancement within the Lab. In addition to directly supporting their mentees, a central task of all leaders in the Lab is to maintain this sense of community, ensuring that the types of bias that threaten students outside the Lab are kept out of the Lab, and that each student has support matched to his or her unique needs and ambitions. Several additional lab practices work to enhance and reinforce the Lab-as-community:

- 1) Students may record lab hours for time they spend tutoring or assisting other lab members, even if it is for a non-lab-related class or assignment.
- 2) An “expert board” lists lab members that students can turn to for help: highlighted skills include foreign languages, programming expertise, and course experience.
- 3) Group outings foster interaction between students on different teams.
- 4) Markers of group identity, like t-shirts or laptop stickers, enhance a sense of belonging.

³ For additional details on the role of Ph.D. students in the Lab, see Becker and Zvobgo (2019).

Adaptation Across Institutional Contexts

Most social science research has modest equipment needs and, while a dedicated lab space and a budget to support community-building activities are ideal, they are not essential. It is important to note that although the SPEC Lab is quite large, many of the practices described in this article can be used at a much smaller scale, for example, a faculty member working with a single team of undergraduates. Whether a faculty member is working with four or forty students, the key binding constraints facing those seeking to start a lab are (1) faculty time, (2) funds for student salaries, and (3) institutional buy-in. The severity of these constraints varies across institutions, and below we outline steps that increase the breadth of the institutional contexts in which the Stewardship Model can be implemented.

Faculty Time

For-credit lab participation can help reduce time constraints on faculty with heavy course loads. When faculty receive course credit for providing mentored research experiences, they gain the ability to advance their own research agenda and mentor students using time that previously would have been spent in the lecture hall. Example syllabi are available in supplementary appendix A.

Student Salaries

Many students from underrepresented groups face tight financial constraints and must work a paying job while in school. Both Federal Work-Study funds and means testing of funding eligibility can reduce wage costs, but they remain daunting. Faculty interested in scaling their research activities with undergraduate students would do well to investigate programs at their institutions that fund undergraduate research. Over the last few decades, Offices of Undergraduate Research have been established at a range of institutions and frequently provide funds to pay students for their

work on faculty research, either during the school year or the summer (Council on Undergraduate Research 2018).

Additionally, private-sector partnerships may be possible, regardless of the substantive research area in which a lab works. Firms face their own version of the pipeline problem and struggle to build sufficiently diverse workforces, including in social science fields. Partnership with an undergraduate research lab that employs the Stewardship Model provides firms with access to a diverse population of well-trained entry-level researchers. The SPEC Lab has received financial support from three “Pipeline Partners”: Talus Analytics, a data science firm; NOVA Infrastructure, a Wallstreet investment firm; and Facebook. The pitch document we use in recruiting these partners is available in supplementary appendix B.

Institutional Buy-In

Institutional support is most likely to be forthcoming when faculty can connect their lab practices to departmental and institutional priorities. Fortunately, the Stewardship Model is malleable in this respect: it serves both teaching and research excellence, promotes diversity and inclusion, and appeals to a variety of potential donors. We have coordinated with the communications arm of our university, which publicizes the op-eds we co-author with students; the advancement office, which asks us to meet with donors interested in our data science training; and the admissions office, which highlights opportunities for undergraduate research experience in their presentations and brochures. We have also received financial support from university initiatives to enhance diversity and inclusion.

A Multi-Institutional, Mixed-Method Evaluation

While there is a maturing literature on the impact of UREs on student outcomes, relatively little systematic work has been done to assess whether there are differential effects across groups (gender,

race, socio-economic status). The SPEC Lab has begun data collection for a multi-institution, longitudinal study of undergraduate research participants and their peers that can evaluate the effectiveness of the Stewardship Model in comparison to other research experiences with respect to both pre- and post-graduation outcomes and that can evaluate how these effects vary across groups.

If targeted recruitment strategies are effective, then our applicant pool should be more diverse than applicant pools for similar competitive opportunities. If training and applied research experience are effective, then students from all backgrounds should experience gains in both skills and confidence. If multi-level mentoring and community-building are effective, it should be reflected in student well-being and retention. And if the model is effective overall, we should see increases in the number of students from underrepresented backgrounds embarking on and succeeding in social science careers.

Our evaluation consists primarily of a multi-wave survey, complemented by semi-structured interviews and an ethnographic study of the lab culture in the SPEC Lab. Our survey instrument draws questions from several pre-existing surveys, which have already been validated. These include questions from the National Survey of Student Engagement (NSSE) and Undergraduate Researcher Student Self-Assessment (URSSA), which are considered the gold standard in this field. Questions regarding mentoring were written based on salient mentoring practices identified in the literature (Olin Shanahan et al. 2015). We include questions regarding specific mentoring practices, as well as indicators of the frequency of contact with mentors and a feelings barometer regarding the student's level of comfort bringing up various topics with their mentor (research, professional advice, personal issues). The survey instrument is included in supplementary appendix C.

The first-round pilot of this survey was fielded in 2019. New waves will be conducted annually through 2028, with attempts to re-survey students even after they graduate.

Conclusion

The Stewardship Model offers a theory-driven, practice-refined system for recruiting, training, and mentoring diverse undergraduates toward successful careers in social science research. The model allows faculty to advance their research and careers, while also serving as good stewards of the mentorship they have received—paying these investments forward and growing the diversity of our field. While developed in an R1 context, the model provides a general framework for mentored research and can be adapted to contexts where financial resources are limited, graduate students are unavailable, and faculty time is constrained by heavy teaching loads.

In addition to evangelizing the Stewardship Model, this article invites scholars to participate in a new multi-institution longitudinal study of the effects of UREs on student outcomes both pre- and post-graduation. This study will allow us to contrast the effects of different approaches to undergraduate research and explore how these effects vary across different groups of students. In so doing, we can determine how to better serve an increasingly diverse undergraduate student body and, in turn, make the professorate more diverse, inclusive, and accessible.

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