

The Stewardship Model: An Inclusive Approach to Undergraduate Research

Megan Becker, *University of Southern California*

Benjamin A. T. Graham, *University of Southern California*

Kelebogile Zvobgo, *University of Southern California and College of William & Mary*

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 career (Schultz et al. 2011). Moreover, 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 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 by not only multiplying them in the next generation but also dispersing them more widely.

This article describes 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. Led by three faculty Principal Investigators (PIs) and a graduate student director, the SPEC Lab conducts research on issues at the intersection of climate change, security, and economic development. 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, nonprofits, or industry.

The SPEC Lab is undergraduate focused, currently serving approximately 40 undergraduate students and a small group of PhD students. The Lab's faculty and PhD students are political scientists by training; however, 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. Although these fields face their own diversity challenges, which we address in part through our work, the Lab's greatest impact is likely on the international relations (IR) subfield of political science, wherein lies our core

expertise. 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 used 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) multilevel 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 we provide the tools and support necessary for them to thrive as researchers and professionals.

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

THE STEWARDSHIP MODEL OF MENTORING

The Stewardship Model draws on research on best practices for mentored UREs (e.g., 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 psychosocial 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 guides our practice, which we developed iteratively over time. Thus, the following sections describe both the abstract principles of the Stewardship 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 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 only 8% of IR scholars in the United States, compared to 12.5% in comparative politics and 14% in American politics (American Political

accessibility of UREs for students who may not have had the same level of preparation, and it encourages retention of students who initially may 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

The pedagogical approach used 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) multilevel mentorship, and (5) membership in a carefully constructed learning community.

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 among 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.

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 online appendix A.

Rather than teach statistics, which is easily available via for-credit courses outside of the SPEC Lab, we focus on applied skills

This team-based approach is critical for retaining diverse students because it allows them to develop a research community and a network of support. Muddling through a complex research problem as a group normalizes seeking help from and giving help to others, and it reframes research as a process of communal discovery.

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, and advising hours—and encourage them to consider participation, irrespective of previous experience. Faculty also have connected with our university's Office for Diversity as well as Black and Latinx student groups on campus to spread the word about the SPEC Lab. Because many students from diverse backgrounds must pursue paid employment opportunities to meet their financial needs, we also have 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 background and technical toolkit. For this reason, we take a developmental approach to training, emphasizing the acquisition of skills over time. This increases

—for example, data management and visualization—that often are omitted from formal curricula in quantitative methods courses. Our goal is to prepare students for the nonacademic job market as well as for graduate school; therefore, 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 SPEC Lab, who have excelled in their team's work, are offered the opportunity to coauthor op-eds with faculty PIs or to 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 PhD student adviser, an undergraduate student team leader, and three to six other undergraduate

researchers. This team-based approach is critical for retaining diverse students because it allows them to develop a research community and a network of support.² Muddling through a complex research problem as a group normalizes seeking help from and giving help to others, and it reframes research as a process of communal discovery.

While working with the faculty PIs, members of the SPEC Lab observe the different phases of a research project and are actively involved in executing them. Faculty PIs and PhD student advisers 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 the retention of undergraduate researchers.

Multilevel Mentoring

We strive for independent, supported work, where every 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 leader. Becker and Zvobgo (2020) also provide an overview of the mentoring philosophy of the SPEC Lab, which discusses at greater length our support for students’ academic development and their psychosocial well-being. This mentoring strategy is critical to the success of the Stewardship Model because 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 SPEC 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 leaders—returning students who have earned promotion through demonstrated excellence—also provide mentorship to their colleagues. The team leader coordinates day-to-day project management, ensuring that 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 reduce 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

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

Building a Learning Community

Multilevel 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 underrepresented groups, and a clear path for leadership advancement within the SPEC Lab. In addition to directly supporting their mentees, a central task of all Lab leaders is to maintain this sense of community, ensuring that the types of bias that threaten students outside of the Lab are kept out of the Lab, and that all students have support matched to their unique needs and ambitions. Several additional 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 among students on different teams.
4. Markers of group identity, such as t-shirts and laptop stickers, enhance a sense of belonging.

ADAPTATION ACROSS INSTITUTIONAL CONTEXTS

Most social science research has modest equipment needs and, although 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 on 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 40 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 the following sections 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 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 online 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

Stewardship Model in comparison to other research experiences with respect to both pre- and post-graduation outcomes, and (2) how these effects vary across groups.

If targeted recruitment strategies are effective, then our applicant pool should be more diverse than those for similar competitive opportunities. If training and applied research

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.

undergraduate students would do well to investigate programs at their institution that fund undergraduate research. In recent decades, Offices of Undergraduate Research have been established at a range of institutions that frequently provide funds to pay students for their work on faculty research, during either the school year or the summer (Hewlett 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 uses 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 Wall Street investment firm; and Facebook. The pitch document we use in recruiting these partners is available in online 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 coauthor 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 its presentations and brochures. We also have received financial support from university initiatives to enhance diversity and inclusion.

A MULTI-INSTITUTIONAL, MIXED-METHOD EVALUATION

Although 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 (i.e., gender, race, and socioeconomic status). The SPEC Lab has begun data collection for a multi-institution, longitudinal study of undergraduate research participants and their peers that can evaluate (1) the effectiveness of the

experience are effective, then students from all backgrounds should experience gains in both skills and confidence. If multilevel mentoring and community building are effective, they should be reflected in student well-being and retention. 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 preexisting surveys, which already have been validated. These include questions from the National Survey of Student Engagement and the Undergraduate Researcher Student Self-Assessment, which are considered the “gold standard” in this field. Questions regarding mentoring were written based on salient mentoring practices identified in the literature (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 a student’s level of comfort in bringing up various topics with a mentor (e.g., research, professional advice, and personal issues). The survey instrument is included in online appendix C.

The first-round pilot of this survey was fielded in 2019. New waves will be conducted annually through 2028, with attempts to resurvey 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. Although it was 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 they 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.

ACKNOWLEDGMENTS

We thank researchers in the SPEC Lab with whom we developed our model for collaborative research. We also thank Therese Anders, Miriam Barnum, and Alix Ziff for developing teaching materials and other resources used in the SPEC Lab, including those presented in the online appendix. We are grateful to Jaime Settle and the guest editors and anonymous reviewers for the *PS: Political Science & Politics* symposium on racial and ethnic diversity in the discipline for valuable comments on earlier drafts. This work is supported by fellowships from the University of Southern California (i.e., Provost Fellowship in the Social Sciences) and the College of William & Mary (i.e., Global Research Institute Predoctoral Fellowship) and a Diversity and Inclusion Grant from the James H. Zumberge Research and Innovation Fund. In addition, this material is based on work supported by the National Science Foundation (NSF) Graduate Research Fellowship Program under Grant No. DGE-1418060. Any opinions, findings, and conclusions or recommendations expressed in this article are those of the authors and do not necessarily reflect the views of the NSF, USC, or William & Mary.

SUPPLEMENTARY MATERIALS

To view supplementary material for this article, please visit <http://dx.doi.org/10.1017/S1049096520001043>. ■

NOTES

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

2. Psychological research suggests that students with lower socioeconomic status respond more positively to communal framing of tasks (Stephens, Markus, and Townsend 2007).
3. For additional details on the role of PhD students in the SPEC Lab, see Becker and Zvobgo 2020.

REFERENCES

- American Political Science Association. 2019. *APSA Membership Dashboard*. Available at www.apsanet.org/RESOURCES/Data-on-the-Profession/Dashboard/Membership. Accessed January 6, 2020.
- Becker, Megan, and Kelebogile Zvobgo. 2020. "Smoothing the Pipeline: A Strategy to Match Graduate Training with the Professional Demands of Professorship." *Journal of Political Science Education* 16 (3): 357–68.
- Center for Strategic and International Studies. 2018. *Leveraging Diversity for Global Leadership*. Washington, DC: Center for Strategic and International Studies.
- Chemers, Martin M., Eileen L. Zurbriggen, Moin Syed, Barbara K. Goza, and Steve Bearman. 2011. "The Role of Efficacy and Identity in Science Career Commitment Among Underrepresented Minority Students." *Journal of Social Issues* 67 (3): 469–91.
- Hewlett, James A. 2018. "Broadening Participation in Undergraduate Research Experiences (UREs): The Expanding Role of the Community College." *CBE—Life Sciences Education* 17 (es9): 1–3.
- Ishiyama, John. 2007. "Expectations and Perceptions of Undergraduate Research Mentoring: Comparing First-Generation, Low-Income White/Caucasian and African American Students." *College Student Journal* 41 (3): 540–49.
- Lopatto, David. 2003. "The Essential Features of Undergraduate Research." *Council on Undergraduate Research Quarterly* 24:139–42.
- Monforti, Jessica Lavariega, and Melissa R. Michelson. 2008. "Diagnosing the Leaky Pipeline: Continuing Barriers to the Retention of Latinas and Latinos in Political Science." *PS: Political Science & Politics* 41 (1): 161–66.
- Schultz, P. Wesley, Paul R. Hernandez, Anna Woodcock, Mica Estrada, Randie C. Chance, Maria Aguilar, and Richard T. Serpe. 2011. "Patching the Pipeline: Reducing Educational Disparities in the Sciences Through Minority Training Programs." *Educational Evaluation and Policy Analysis* 33 (1): 95–114.
- Shanahan, Jenny Olin, Elizabeth Ackley-Holbrook, Eric Hall, Kearsley Stewart, and Helen Walkington. 2015. "Ten Salient Practices of Undergraduate Research Mentors: A Review of the Literature." *Mentoring & Tutoring: Partnership in Learning* 23 (5): 359–76.
- Steele, Claude M., and Joshua Aronson. 1995. "Stereotype Threat and the Intellectual Test Performance of African Americans." *Journal of Personality and Social Psychology* 69 (5): 797–811.
- Stephens, Nicole M., Hazel Rose Markus, and Sarah S. M. Townsend. 2007. "Choice as an Act of Meaning: The Case of Social Class." *Journal of Personality and Social Psychology* 93 (5): 814–30.