

What's Next?: Looking Forward at a Time of Reflection

by Aaron M. McCright

Since 2010, I've served as Associate Professor of Sociology at Michigan State University (MSU) with a majority (75%) appointment in Lyman Briggs College (LBC)—an undergraduate residential community for the study of science and society—and a minority (25%) appointment in the Department of Sociology (SOC). I also have a courtesy appointment in the Environmental Science and Policy Program (ESPP). My employment contract defines my responsibilities as 42% teaching, 33% research, and 25% service. My intellectual pursuits in these three domains are integrated and mutually reinforcing, even as I discuss them separately in this essay. I do what I do because I love to learn and I want to help others learn. Overall, I aim to facilitate learning of core concepts, leading theoretical arguments, rigorous methods, and robust findings from environmental sociology, sociology of science and technology, and political sociology/social movements. As strong as my last six years have been, I expect that my future work will be even more impactful.

TEACHING

I have deep passion for teaching, especially teaching sociology to biological and physical science, technology, engineering, and math (STEM) students, though I also value teaching sociology to graduate students in the discipline. I've cultivated a strong identity as a teacher through varied experiences in the classroom and in study away/abroad programs; by honing my skills through professional development activities; and via regular reflection upon student and peer feedback. Not only do I draw insights from the scholarship on teaching and learning (SoTL), but I've also contributed to this literature.

In the past six years, I've taught multiple sections of four courses, three undergraduate history, philosophy, and sociology of science (HPS) courses in LBC and one graduate course in SOC. Given the nature of my appointment and my teaching load, I'll focus mostly on my LBC teaching and then briefly discuss my SOC teaching and advising. Each of my LBC courses is four credits, interdisciplinary, writing-intensive, and includes mostly STEM students:

- LB 133: Introduction to History, Philosophy, and Sociology of Science (taught twice; once as Honors section)
- LB 335: The Natural Environment: Perceptions and Practice (taught twice as "Foundations and Frontiers of Environmental Social Science" and once as Honors section titled "Climate Change");
- LB 492: Senior Seminar (taught thrice as "Where We Are and Where We're Going" and once as "Investigating Diversity in Science").

My **Teaching Philosophy** derives directly from my middle-class, rural Iowa upbringing as the son of a high school teacher and a registered nurse. To me, education is crucial for effectively performing citizenship responsibilities, positively contributing to public decision-making, and successfully competing in our increasingly global labor force. This teaching philosophy directly informs my three **Primary Teaching Goals**. First and most broadly, I strive to teach young adults to become lifelong learners who can protect their civic interests; promote the public good; and perform meaningful, fulfilling work throughout their lives. Second, I aim to improve their understanding of core HPS and sociological concepts, theories, methods, and findings. Third, I seek to sharpen their analytical reasoning and problem-solving skills as well as enhance their scientific and quantitative literacies. All of my LBC courses—taught in service to these goals—feature the same **Signature Characteristics**, intentionally chosen because research shows their effectiveness in increasing learning gains. For each, I'll offer a few illustrative examples of how they have been implemented across my LBC courses.

My courses are learner-centered, focused on addressing prior knowledge, promoting reflexivity about learning (i.e., metacognition), and employing formative assessments and mid-semester feedback to empower students. From the outset, I stress that a course is "ours" and not "mine," and I tell students I see them as collaborators in the learning process. I believe students will invest themselves heavily in a course if given not only multiple, diverse opportunities for engagement but also a real role in defining these opportunities. At the beginning of semesters or major units, I try to assess and address misconceptions (e.g., of climate change) and prevailing myths (e.g., technological progressivism, or the worldview that nearly all technological developments are "advances" that necessarily cause "progress"). Especially in my freshman course, I offer several opportunities for students to reflect upon their writing, time management, and reading skills so they can use this self-awareness to improve these skills. In addition to measuring learning with almost daily formative assessments, I gather anonymous mid-semester feedback to assess how well the course design and activities are helping students learn; I routinely make nontrivial changes in my teaching as a result of this constructive feedback.

My courses utilize active learning techniques to facilitate student investment in and ownership of the course. Students show up each day knowing that they will *do* something (if not a few things) relevant to the assigned reading/topic. Many of these activities are relatively modest and take place within a single class period, e.g., writing and filming a news segment on a new environmental study to practice science communication. In each course, I also try to employ at least one long-term inquiry-based learning project that students conduct in teams. For example, my students create and refine analytical models explaining human drivers of environmental change, examine citizens' views about diversity and inclusivity in science via survey research, and investigate the effectiveness of selected messaging or framing strategies for influencing citizens' climate change views via experiments.

My courses feature different styles of collaborative learning, whereby students learn via working together. In addition to the long-term team projects noted above, other examples of collaborative learning activities range from rather basic, brief

work in pairs (e.g., think-pair-share) to activities completed within a single class meeting (e.g., participating in a multi-stage simulation of Garrett Hardin’s “tragedy of the commons” to examine the effectiveness of different governance structures for managing common-pool resources) to longer, more complex collective activities (e.g., designing a service-learning project to run a day-long science fair for underserved middle-schoolers). Also, in every course, my students work in pairs to lead class discussion for an hour on an assigned reading, helping them further strengthen their communication and leadership skills.

My courses employ authentic assessment methods, whereby students demonstrate what they have learned by performing meaningful tasks that practitioners with HPS or sociology degrees actually perform. Because I believe that students often can learn just as much when asked to write and defend intriguing questions than they can when eventually answering them, I regularly have my students help design some of these opportunities. After all, knowing which questions to ask and how to ask them is a skill that will serve them well as a lifelong learner. Across my courses, my students create and present formal research posters and press releases for their inquiry-based learning projects, write policy briefs to inform elected officials about managing environmental risks, craft newsmagazine articles to explain an important scientific issue to the general public, and present a short pitch for an actual environmentally friendly product or service they created to a potential investor.

These assessments regularly require that students engage with ill-structured problems, ones that are controversial, ambiguous, and opaque in their definitions, causes, and solutions. Working through such problems helps students move from lower to higher stages of intellectual development by forcing them to reason analytically, deal with complexity, and manage uncertainty. Struggling through the challenges of ill-structured problems is messy and frustrating as is actual science research, but students usually see such work as deeply meaningful. Besides the projects noted above, my students work through other ill-structured problems such as applying Earth Charter principles to improve our university’s sustainability; designing a public information campaign to increase Americans’ understanding of climate change and likelihood of performing energy conservation behaviors; and creating a feasible, effective solution to a serious societal problem.

Finally, all of my courses feature performance-based assessment standards. Students receive the rubrics I use to assess all major assignments at the first class meeting, and we review these periodically throughout the semester. Measuring individual students’ performance against clear standards in rubrics—rather than against the performance of others—facilitates non-zero-sum outcomes. That is, when students realize that most, if not all, would individually benefit from cooperation, they typically invest more in collaboration and generally abstain from overly selfish hyper-competition.

While I teach much less for SOC, I’m nevertheless proud of my teaching and advising contribution to my minority unit. As Associate Professor, I’ve taught my signature graduate course, Environmental Sociology, three times. Its enrollment has risen from 7 to 12 to 14 (which is quite large for a SOC graduate seminar), largely by attracting an increasing number of students from other graduate programs. I’m regularly revising my course design to help SOC and non-SOC students engage with the foundations of the field and also with its continually changing frontiers. In the last six years, I’ve served as primary advisor for three PhD students. One earned his PhD, secured a tenure-system faculty position, and is now PI on a large NIH grant. The next two currently are working on their dissertations and are on pace to earn their PhDs in spring 2017. One of these students recently secured a Doctoral Dissertation Research Improvement grant from the NSF Sociology program, and I’ve already co-authored two articles with the other. In addition to the six active SOC PhD committees on which I serve as a regular member, I’ve served on committees that saw five SOC PhDs, four non-SOC PhDs, and six non-SOC MAs/MSs earned in the last six years.

Over the years, I’ve marshalled direct and indirect evidence of the effectiveness and impact of my teaching activities. As **direct evidence of student learning**, I’ve demonstrated that, for example, students:

- learn core HPS concepts and arguments and increase their scientific and quantitative literacies through their performance on pre-course/post-course assessments;
- learn about human influence on the environment through the increased explanatory power of their analytical models of human drivers of environmental change;
- learn about Americans’ climate change views by their creation and presentation of high-quality posters conveying the results of their original research on such views; and
- learn important HPS ideas and improve their writing skills via their modestly sophisticated and relatively deep arguments about real-world HPS phenomena in a researched essay written via a semester-long scaffolding process.

The course evaluation instrument used in both LBC and SOC—the Student Assessment of Learning Gains (SALG)—is my main source of **indirect evidence of student learning**. LBC and SOC use different versions of this instrument, but both ask students to assess (a) how much help that course features and the instructor’s behaviors helped them learn and (b) how much learning gains they made in important areas. Across the courses I teach, students report that my pedagogical decisions and our course activities offer between “much help” and “great help” with their learning and report that they have made between “much gain” and “great gain” in their learning.

Peers also have provided **evidence of my teaching effectiveness and pedagogical impact**. Peer evaluations of my classroom teaching are regularly rather positive. Over my years at MSU, I’ve received recognition and awards for my undergraduate and graduate teaching. Twice I was recognized for my contribution to LBC, I received a graduate teaching award in SOC, and I received two competitive all-university teaching awards at MSU. Most recently in 2014, I received the Larry T. Reynolds Award for Outstanding Teaching of Sociology from the Michigan Sociological Association. Further, I’ve made modest contributions to the peer-reviewed SoTL literature: four articles on how climate change instruction at the course

or curricular level may increase science and quantitative literacies and one article on the nature and impacts of LBC as a residential college of science and society. Also, as I'll discuss again in my final section, peers have recognized my leadership in interdisciplinary teaching and learning and in sociological pedagogy, with the latter resulting in me accepting the position of SOC Associate Chair in August 2016.

In the next few years, I look forward to further revising and reinvigorating the SOC undergraduate program, especially employing insights and improved skills from my earlier pedagogical experiences. In my own teaching, I remain committed to teaching STEM students HPS primarily by providing them with meaningful opportunities to *do* authentic social science. Even further, I'd like to explore possibilities for them to publish their work in peer-reviewed undergraduate research journals. Finally, I want to continue my SoTL work on how teaching climate change in interdisciplinary settings and via inquiry-based learning activities may help strengthen students' scientific and quantitative literacies. Along these lines, I also aim to include more undergraduate students in my own research.

RESEARCH

My scholarly agenda is to *enhance our sociological understanding of how scientific and technological developments, top-down and bottom-up political processes, and enduring social structures influence societal capacity for recognizing and dealing with environmental impacts and technological risks*. As Associate Professor, this intellectual aim has motivated and informed all of my major projects. Due to space limitations, I'll abstain from discussing (a) my SoTL research mentioned briefly in my teaching section, (b) projects (e.g., on societal risk governance) that are mostly finished, or (c) projects (e.g., on social movement identity) that are relatively minor within my overall agenda. Instead, I'll focus on my four ongoing, long-term projects. After generally characterizing my scholarship, I'll discuss each major project's scholarly contributions before providing evidence of the impact of my research. While I highly value collaboration and often co-author publications, I'll consistently use "I" and "my" when discussing the individual components (i.e., publications, grants, etc.) within these four major projects rather than shifting back and forth between first person singular and plural.

Earlier in my career, I made significant empirical (and also modest theoretical and conceptual) contributions to our understanding of US-based organized climate change denial, especially of the roles of conservative think tanks and contrarian scientists. As Associate Professor, I've concentrated on providing conceptual and theoretical insights on **the structure, strategy, tactics, and impacts of the US-based climate change denial countermovement**. My interest in such impacts has led me since 2008 to analyze theoretically relevant **patterns and trends in climate change views**. Shortly after promotion, I broadened my vision to also develop and test theoretical arguments for selected **predictors of environmental decision-making (EDM)** more generally. Finally, my work on the politicization of climate science/scientists has led me to investigate **key predictors of public views about science and scientists** in the last three years. Across these four projects, I employ a range of methods (e.g., survey research, experiments, archival research, and analysis of existing data) and utilize both quantitative and qualitative analytical techniques. Much of this research has been supported by a mix of internal and external grants and contracts.

The anti-reflexivity thesis (ART), of which I am lead architect, theoretically integrates these four major projects into a coherent endeavor. While seminal ideas about the ART first appeared in my 1998 MA thesis, this argument has only appeared in peer-reviewed publications since late 2010. While I continue to develop, extend, and test its theoretical arguments, I can briefly characterize the ART as a framework for understanding structural, organizational, and individual opposition to the claims of the scientific community and social movements that industrial capitalism produces serious negative effects necessitating its (increased) regulation by an interventionist government. As such, ART provides key insights about important dynamics at the macro, meso, and micro levels. At the societal and organizational levels, ART helps explain the emergence, mobilization, and impact of organized anti-environmentalism (and organized climate change denial more specifically) since the early 1990s. At the individual level, ART helps explain the patterns of anti-environmentalism (and climate change skepticism more specifically) and of distrust of science and scientists within the general public.

My initial work on **the structure, strategy, tactics, and impacts of the US-based climate change denial countermovement**, helped launch the social science literature on this topic in the early 2000s. As Associate Professor, my work in this area has focused mostly on synthesizing this rapidly expanding literature, identifying the most robust findings, and explaining the major patterns and trends via existing and novel theoretical concepts and arguments. Briefly, my publications explain why and how multiple components of this countermovement (e.g., fossil fuels industry, conservative think tanks, contrarian scientists, front groups, conservative politicians, and conservative media) mobilize to promote climate change denial. As noted above, anti-reflexivity drives this countermovement, which employs a general strategy of manufacturing uncertainty and controversy about climate science and policy that is operationalized in several nondecision-making tactics (i.e., those for keeping an issue off an agenda or preventing a decision on an issue).

The core thrust of my research since promotion has been theoretically guided analyses of key **patterns and trends in climate change views**. Besides some work on gendered views of climate change (confirming the arguments of gender socialization theory), most of my research in this area focuses on the political dynamics of climate change views. Mostly using access to the longest time-series dataset on Americans' climate change views, my main contributions here are documenting and explaining the following patterns and trends that are anticipated by the overarching ART framework:

- the significant political polarization on climate change views in the US general public, which is consistent with party sorting theory;
- how political orientation moderates the relationship between education and climate change views, suggesting motivated reasoning or biased assimilation;
- the greater endorsement of climate change skepticism among conservative white males, consistent with identity-protective cognition and the “white male” effect from the risk perception literature;
- the key influence that perceived scientific agreement has on support for climate change action, as mediated by belief in the reality, human cause, and seriousness of climate change (in what’s termed the “gateway belief model”); and
- how the influence of political orientation on climate change views trumps that of exposure to temperature anomalies or climate extremes, thus providing no support for the claim that personal experiences with climate change will overcome politically motivated cognition.

In addition to these contributions, I’ve also made progress in conceptualizing and operationalizing climate change skepticism, especially attending to its dimensionality (i.e., trend, attribution, impact, and consensus skepticism). Most recently, I’ve provided evidence that potentially promising frames for increasing belief in climate change and support for action to deal with the problem have no consistent effect on climate change views; yet, a brief exposure to a climate change denial message increased public skepticism about climate change, especially among conservatives. Because of my established expertise on climate change views, I recently was invited to write an authoritative review essay summarizing what we know about the predictors of climate change views. This essay, which will be published by the end of August, represents the culmination of my work on climate change views over the last eight years. In addition to reviewing nearly all the published articles in this area, I advance an integrative theoretical framework—essentially an extension of the ART—that explains why the strength and consistency of key predictors vary within and across nations.

Since my promotion, I’ve renewed with my earlier interest in, and engagement with, the wider environmental decision-making literature by developing and testing theoretical arguments for selected **predictors of EDM**. Across this project, I’ve analyzed data from several existing surveys and a few new experiments. My articles help explain gendered patterns in EDM via gender socialization theory; confirm that there has been no measurable “greening of Christianity” within the American public; reveal that union households are no less concerned about the environment than are non-union households; and explain how and why support for environmental protection has become politically polarized in recent decades.

I’ve also worked a good deal on conceptualizing and operationalizing new EDM measures for surveys and experiments. For instance, I’ve further validated a measure of identification with the environmental movement, demonstrating that it has greater explanatory power than does a “self-identified environmentalist” measure. In addition to improving how we measure self-reported environmental behaviors and behavioral intentions by incorporating sensitivity to “behavioral plasticity,” I’ve also developed a measure of observed environmental behavior for use in surveys and experiments.

My fourth major long-term project—investigating **key predictors of public views about science and scientists**—is still in the germination phase, having commenced only in the last few years. My earlier work on the politicization of climate science and the development of the ART motivated the first article in this project. Briefly, this initial publication confirms a key tenet of ART by demonstrating that while Democrats report greater trust than do Republicans in scientists who investigate the negative impacts of technological developments and economic activity (i.e., impact science), the reverse is true for trust in scientists whose work clearly supports or promotes economic production (i.e., production science). Rather than accept simplistic, though popular trope of “the Republican war on science,” I argue that we gain more understanding by disaggregating science into theoretically relevant dimensions.

Most of the other components of this final major project are funded by small grants to create design new studies, gather pilot data, and apply for external grants to expanding them. In one component, I’m examining factors that may influence public skepticism of the scientific consensus on climate change, GM food, and childhood vaccines and designing messages that help reduce such skepticism. Three messaging experiments and one statewide representative survey of Michiganders’ views of vaccines will be fielded this fall. In two other components, I’m investigating how scientists’ stated values or perceived conflicts of interest may influence citizens’ trust in these scientists and perceived credibility of the scientists’ subsequent findings. In a fourth component, I’m analyzing how retractions of scientists’ articles influence citizens’ trust in scientists, focusing on whether the retractions were due to honest mistakes or intentional misconduct and on whether the scientists acknowledges or denies such mistakes/misconduct. Across the components of this fourth project, I’m performing conceptualization and operationalization work to create new instruments to measure: general trust in scientists; trust in production/impact scientists more specifically; affect toward scientists; and views about childhood vaccines.

Compared to my six years as Assistant Professor, my six years as Associate Professor have been much more productive and impactful by several metrics. First, my production of journal articles has radically increased. While I published 10 journal articles, 5 chapters in edited volumes, and 1 edited book pre-tenure, I published 37 journal articles, 5 chapters, and 1 book post-tenure. Also, four of my journal articles have been reprinted in edited volumes in the last few years. Second, I’ve succeeded in placing my work in scholarly journals with higher impact factors; my pre-tenure average IF was 1.246, and my post-tenure average IF is 3.185. Third, my publications are achieving greater impact in the scholarly literature. Over my career, my annual citation counts have increased monotonically without yet plateauing, according to Google Scholar. From 2004-2010 my publications garnered 665 citations. Since 2011, that number is 3,725 as of August 15, 2016. Approximately

2,055 of these are for works published post-tenure. Further, I'm lead author on the 8th most cited journal article in Sociology published since 2010, approximately 10 of my articles rank among the most downloaded and/or cited in their respective journals. Fourth, this heightened reputation in the scholarly community has led to many invitations to advisory boards, workshops, conferences, and public talks. Unfortunately, due to several years of health problems, I've only been able to accept a fraction of these invitations, which deal mostly with my research on organized climate change denial and climate change views. Fifth, helped by a dozen MSU press releases, my publications as Associate Professor have garnered quite a large amount of media attention. Several of my articles have received substantial coverage in many top-circulating newspapers in the US and beyond and in major science and environment blogs.

In the coming years, I'll continue advancing my four long-term projects all while further formulating, elucidating, and applying the ART that binds them together. I currently have eight manuscripts under review, even more in various stages of preparation, and a few external grant proposals either close to (re-)submission or in earlier stages of preparation. I'm looking forward to making further theoretical, conceptual, and empirical contributions that improve our sociological understanding of how scientific and technological developments, political processes, and social structures influence societal capacity for recognizing and dealing with environmental impacts and technological risks.

SERVICE AND LEADERSHIP

I'm proud of the service I've performed and the leadership I've displayed as Associate Professor. Given space limitations, I'll simply highlight my main accomplishments and my most substantial contributions within my home units (LBC and SOC), across MSU more generally, and to my profession and the wider scholarly community. In addition to the more tangible activities described below, I've also done much to help undergraduate students. For instance, I've served as faculty advisor to approximately a dozen HPS majors and informally advised and mentored several dozen more undergraduate students. In the last six years, I've written about 90 recommendation letters for approximately 40 undergraduate students (as well as about 130 letters for almost 20 graduate students). As well as helping incoming LBC freshman better understand the HPS curriculum during pre-semester orientation sessions, I've also engaged with students about my research at meetings of different registered student organizations.

As Associate Professor, I've served multiple-year terms on the Advisory Committees for each of my academic units—LBC (chairing in 2015-2016), SOC, and ESPP—and on the Advisory Boards for both university-wide offices/programs with which I'm most closely associated—Office of Faculty and Organizational Development (F&OD) and Science Studies at State (S3). On the LBC and SOC Advisory Committees, I helped advise the unit head on behalf of the faculty; create, revise, and clarify important unit policies and procedures; and manage either the faculty annual evaluation process or the reappointment, promotion, and tenure process for my colleagues.

In the last six years, I've had the honor of serving on eight faculty search committees: three tenure-system searches in LBC (chairing two), two tenure-system searches in SOC, and three fixed-term searches in LBC. Even though faculty searches require considerable time and effort during already busy semesters, I nevertheless thoroughly enjoy devoting my time and effort for this important service that has deep stakes not only for the composition of our academic family but also for the professional careers of our candidates.

Through service on other standing and ad hoc departmental, college, and university committees, I've made substantial contributions to curriculum revision. I'll highlight my work on the SOC Undergraduate Education Committee, which I Chaired in 2014-2015. Briefly, I created measurable curricular learning outcomes for the SOC major, proposed significant changes to the SOC curriculum that align with these new learning outcomes, and created a new student evaluation instrument for all SOC courses. These proposed changes either have been adopted or are currently in the process of being approved.

Finally, my scholarly expertise on climate change, my broader reputation within environmental sociology, and also my SoTL contributions have generated several opportunities for important service to my profession and the scholarly community more broadly. In addition to co-organizing specific sessions at annual meetings of the American Sociological Association (ASA) and American Geophysical Union, I also co-organized three interdisciplinary conferences: two on interdisciplinary teaching and learning and one on social studies of science. Further, I served as a contributor to the ASA Task Force on Sociology and Global Climate Change, ultimately co-authoring two chapters of its final report. As well as reviewing book proposals and manuscripts for three prestigious publishing houses and reviewing approximately 100 manuscripts for about 50 scholarly journals, I also serve on the editorial boards of three major environmental science journals: *Global Environmental Change*, *Environmental Politics*, and *Energy Research & Social Science*. In addition to reviewing individual grant proposals for Canada's Social Sciences and Humanities Research Council and for four NSF programs, I've served on review panels for NASA and for the EPA.

In the next few years, I especially look forward to continuing my leadership in the revision and assessment of the undergraduate and graduate curricula in my home units. Indeed, on August 1, I accepted the position of SOC Associate Chair, with primary responsibility for the department's undergraduate program. In addition to continuing to strengthen this program, I also look forward to increasing the clarity, transparency, and fairness of various departmental policies and procedures. I expect that my time as SOC Associate Chair will offer with valuable learning experiences and opportunities for strengthening relevant skills that may allow me to accept further administrative responsibilities in future years.