



Interdisciplinarity: Its Role in a Discipline-Based Academy

Report of the Task Force on Interdisciplinarity

Interdisciplinarity: Its Role in a Discipline-Based Academy

A Report by the Task Force of the
American Political Science Association

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AMERICAN POLITICAL SCIENCE ASSOCIATION

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Preface

The following summarizes the extended report of the Task Force on Interdisciplinarity appointed by the American Political Science Association, with support from the National Science Foundation (SGER SES-0630310). The purpose of this project is to advance interdisciplinarity, particularly in the social and behavioral sciences, by identifying, examining, and recommending best practices for its development. This summary report will be followed by an extended, detailed, and comprehensive report.

The Task Force sought ways in which the academy can promote interdisciplinary research and teaching, when it is appropriate to undertake such efforts, and to provide guidance in assessing when such efforts are most profitably undertaken. We further sought ways to assist the student, scholar, and administrator in negotiating the contemporary world of the academy. There are significant pressures and benefits for approaching problems via interdisciplinary efforts within an academy founded on the disciplines, and in which its disciplinary basis remains important and valuable.

We focus on procedural aspects of practices currently in use, including incentives, organizational structures, and techniques to educate students and scholars to work effectively in interdisciplinary approaches. Our intent is to provide a guide to promising innovations that have worked well, rather than to judge which ones might be the best. Best practices are presented from a wide range of academic fields and institutions. The report is intended to be helpful to an equally wide range of academicians, including researchers and teachers themselves, and the directors of institutional structures that shape the research and teaching environment.

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Interdisciplinarity: Its Role in a Discipline-Based Academy

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PART I. Defining Interdisciplinary Practice in the Academy

Introduction: Connections and Creativity

“The greatest enterprise of the mind always has been and always will be the attempt to link the sciences and the humanities,” writes entomologist Edward O. Wilson. “The key to unification is consilience. William Whewell, in his 1840 synthesis *The Philosophy of the Inductive Sciences*, was the first to speak of consilience—literally a ‘jumping together’ of knowledge as a result of the linking of facts and fact-based theory across disciplines.” (Wilson 1998b)

In this report, we consider when and how the university can be the catalyst to achieve Wilson’s “jumping together” in its efforts to serve society as the engine of new ideas. It is widely understood that new knowledge erupts at the interface of disciplines, like lava from the collision of the earth’s tectonic plates. It is less understood how these collisions happen and what ignites the creative impulse that culminates in a transforming idea. Scholars from E.O. Wilson (Wilson 1998a) to neurologist Oliver Sacks (2008) have noted that the great insight comes to a prepared mind—one that has been at work on a problem and has accumulated deep knowledge in a discipline. When curiosity drives the expert beyond the borders of that discipline, a solution arises from connections to the concepts and practices drawn from a different and, often, distant and surprising field. The collision is sometimes serendipitous and sometimes actively sought. In either case, the academy can play a vital role in preparing the minds of scholars and in creating the environment and opportunity to connect knowledge across disciplines.

Robert Axelrod established the Task Force during his APSA presidency to identify the best practices of the academic community to foster interdisciplinary teaching and research. In his 2007 APSA Presidential Address, Axelrod describes interdisciplinary

practice as “importing and exporting” ideas from one discipline to another. As an example of importing knowledge, he tells how Charles Darwin formulated his great insight into the origin of new species (Axelrod 2008).

Darwin had spent years collecting his data. Then, as he wrote in his autobiography, spent fifteen months working systematically to try to understand the puzzle of how new species arose. At this point, he says, he happened to read for amusement Malthus on *Population*. Darwin reports that being well prepared to appreciate the struggle for existence, it at once struck him that under these circumstances, favorable variations would tend to be preserved and unfavorable ones would tend to be destroyed. The result of this struggle could be the formation of a new species. He wrote that here at last he had a theory by which to work (Axelrod 2008).

Darwin “imported” a key insight from Malthus, a political economist. In an example of exporting knowledge, Axelrod (2008) reported the experience of political scientist Robert Putnam, who was working on his book *Making Democracy Work* (1993) when he came upon the concept of social capital by accident one night in the library:

He had been puzzling in vain for weeks over how to pull together the empirical threads of his Italy study. . . . [H]e happened to wander over to the library and noticed a new book called *Foundations of Social Theory* by Jim Coleman [1990]. He idly leafed through it, noted a chapter on social capital, and sat down to read it. . . . [H]is mind had been “prepared” by his interest in repeated games, and he saw pretty quickly that social networks could produce something directly analogous to the “shadow of the future.” He says that like all insights, once he got it, it was terribly obvious.

“Political scientists have a long and honorable tradition of importing ideas from other disciplines such as psychology, history, sociology, and economics. But historically, political science has not done as much exporting as it has importing.”

The Task Force sought to make its findings as general to the academy as possible. Inevitably, of course, there are special characteristics of its home discipline that might affect its views of the problem. Axelrod, for instance, noted in this presidential address that “Political scientists have a long

and honorable tradition of importing ideas from other disciplines such as psychology, history, sociology, and economics. But historically, political science has not done as much exporting as it has importing.” As a discipline, political science is rich in content. Scholarship in political science and in a wide range of other disciplines can benefit from advancing the ways that political scientists conduct interdisciplinary work.

The Task Force explored the ways scholars, students, and administrators pursue interdisciplinary teaching and research. Our report examines two major issues:

- First, we consider how, why, and to what extent the modern institution of higher learning has evolved as a rich mixture of disciplinary and interdisciplinary

structures. Thus, we first consider the value of a discipline-based academy. Here we assess the value of peer review and related mechanisms by which the value of scientific knowledge can be established, especially for establishing the credibility of knowledge claims within the discipline by those from outside the discipline and thus possibly lacking the specialized knowledge to judge such claims. This discussion then considers the value and challenges of interdisciplinarity from the perspective of the colleges, universities, and centers where it is practiced.

- By way of conclusion, we then consider interdisciplinary teaching and research from the perspective of the individual faculty member, researcher, and student. Imagine that you are a graduate student, a junior or a senior faculty member, a department chair, a member or leader of an interdisciplinary unit, or perhaps even a higher-level administrator. How do you negotiate interdisciplinary practice in a discipline-based academic world? Whether or not the individual embraces it, interdisciplinary practice is expanding in the academy, and students, faculty, and administrators must meet the challenges of applying effective interdisciplinary structures and approaches to advance academic knowledge.

Definitions of Interdisciplinary Practice

What does “interdisciplinary” mean in the academic setting? Teaching and research initiatives that draw on knowledge and methodologies from more than one discipline are variously called interdisciplinary, multidisciplinary and trans-disciplinary. These are terms that may or may not refer to specific characteristics of the practice. For a standard definition of interdisciplinary, perhaps the closest approximation is that offered in a study commissioned by the National Academy of Sciences (2005, 26):

Interdisciplinary research (IDR) is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or field of research practice.

Interdisciplinary thus differs from how the term “multidisciplinary” is often used in that interdisciplinary seeks a common understanding or solution to problems, whereas multidisciplinary is often used to signify bringing two or more disciplines together to learn of differing perspectives on some problem of shared interest.

Our working definition adds consideration of teaching, but is otherwise similar. The key concept, in our opinion, is that interdisciplinary practice necessarily takes disciplines as given. It involves the integration of ideas and methods from at

least two established disciplines into what attempts to be a single, new, coherent whole.¹ It is possible, of course, for one person to be interdisciplinary. John Von Neumann, for

Interdisciplinary practice necessarily takes disciplines as given. It involves the integration of ideas and methods from at least two established disciplines into what attempts to be a single, new, coherent whole.

example, made important contributions to mathematics (his home discipline), economics and game theory, computer science, and biology. Interdisciplinary work also can be done purely within one discipline. Both political science and economics departments often have programs in political economy, for example. In most cases, however, the interests and concerns about interdisciplinarity involve new collections of individuals, from two or more established departments, who spend at least part of their time in new administrative units.

Most published work on interdisciplinary practice focuses on research. Our report also explores interdisciplinary teaching at both the undergraduate and graduate levels. Our focus at the undergraduate level is more on the nature of the classes and the teacher. Interdisciplinarity, per se, is less central for the typical undergraduate. Undergraduate liberal arts students, even those advanced in their majors, encounter departments rather than disciplines, for the most part. They are not only continuously immersed in at least a multidisciplinary life, semester after semester—even majors rarely take a full semester of courses in a single discipline—but it is also the case that very few undergraduates have any interest in the profession of a discipline, nor do most courses we teach focus on what makes our subject matter a part of a discipline rather than provide insight into a subject matter. Teaching undergraduate interdisciplinary courses (or engaging students in interdisciplinary research) does, however, matter very much to the instructor, the department, and the administrator.

This report is written primarily from the perspective of one academic discipline—political science. However, we view interdisciplinarity as a general experience, clearly applicable to other social and behavioral science disciplines. A social or behavioral scientist in any given discipline faces an increasingly interdisciplinary world. We believe that what we have encountered in formulating this report applies across most of the departments that constitute the typical liberal arts college, and perhaps to professional schools and some research institutions as well.

A social or behavioral scientist in any given discipline faces an increasingly interdisciplinary world.

The Value of the Discipline: Its Role in the Organization and Standards of Knowledge

The understanding of disciplinarity must begin with an understanding of the discipline as the fundamental unit of academic practice. At its most evident, one cannot build an interdisciplinary approach except on the basis of disciplines. Interdisciplinary scholarship and research are more than the interactions among disciplines. The academy itself is built upon disciplines, and the academy's values are the values of its multiple disciplines.

In the 1960s and 1970s, Thomas Kuhn's *The Structure of Scientific Revolutions* (1996 [1962]) was virtually required reading throughout the social sciences. Kuhn's argument

was that paradigmatic research, once achieved, made possible the establishment of a science. “Normal science” was understood as the day-to-day work within the academic discipline through which the actual heavy-lifting of the creation of a body of knowledge could be achieved. It was the virtual definition of a discipline in which the scientist operated. And so the discipline is, in effect, the basic unit of scientific knowledge. Significant advances in creating new theories and paradigms, that is, those that created the scientific revolutions, were generated often by aspects of interdisciplinary practices—typically by newcomers well versed in the understanding of one discipline who encountered a new subject and scientific problem in another discipline. But the real work of solving scientific problems came from within the discipline’s activity of day-to-day normal science. Progress was judged by the assent of the relevant scientific community. This would, eventually, be true for new disciplines based on scientific revolutions.

The case of a shift in paradigms was another story, however. Attaining assent of the relevant scientific community for a new paradigm, Kuhn argued, was extremely difficult because of a conservative bias favoring the established order. Or, as Neils Bohr is supposed to have said to Albert Einstein, “We are winning this [revolution in physics to relativity theory] one funeral at a time,” indicating just how difficult it can be to achieve the assent of the scientific community in a scientific revolution. Once, however, there is agreement on the theories, methods, and assumptions that define the paradigm, they become institutionally embedded within the discipline. The assent of the relevant community then becomes the basis by which scientific knowledge can be communicated beyond the discipline, and thus becomes one of the central values of the discipline.

The modern college and university is built on a disciplinary basis for many reasons, but central to all of them is this assent of the relevant scientific community—most commonly manifest in terms of its core function: peer review. One way to define a discipline is as being the membership of the relevant scientific community who are eligible to give their assent via peer review. To be a discipline in this sense is to define, *inter alia*, the community who will judge the value of any given research product for contributing to the stock of human knowledge in that subject area. What is expected of a new graduate student entering the academy? What are the criteria for an academic post and for advancement in an academic career? These questions define the institutional structure of the disciplines, that mix of national and international organizations, as they intersect with the structure of the contemporary college and university.

These questions are important to understanding the internal workings of the disciplines. The more important question for our purposes is the value of the assent of the relevant scientific community for disseminating knowledge more broadly. By what criteria does the larger population determine whether any claim is worth attending to? The answers to this and similar questions are based on peer review—whether directly or indirectly. In the immediate case, peer review determines whether, for example, a

medical finding is accepted into the *Journal of the American Medical Association*; in the long-term, peer review helps determine whether the findings of that article are taken seriously by those outside the group of medical researchers. These entities have gravitas because of the peer review known to stand behind the evaluation of the scientist and of the science.

Peer review is a foundation of disciplinarity, because the definition of a discipline includes not only who qualifies as a member of the knowledge-generating community, but also what counts as a contribution to knowledge. The shared understandings, assumptions, methods, and questions that define the intellectual basis of the discipline make possible the development of a sufficiently large number of scholars who can judge fairly and credibly whether a proposed contribution to that discipline's knowledge meets the standards of that discipline. This cadre of scholars generates and evaluates the knowledge, according to agreed-upon standards of logical coherence and empirical validity.

A core difficulty of interdisciplinary research is that it often lacks a well-defined scientific community from which to attain peer review and thus to render judgments that can be taken as valid and reliable measures of quality, inside and outside the field of scholarship. The research question is too new to have an established set of standards. Too few are involved in and thereby expert in the scholarship to form a

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relevant scientific community capable of granting assent. The new field often is too heavily dominated by individuals seeking to establish the area as a major topic of research, making it difficult to recognize or credit dispassionate judgment. There are no journals with sufficient track records that can be used as measuring

rods of quality peer review. Degree programs are too new or non-existent to provide reliable training for scholars entering the research area. A discipline, by contrast, has these structures and practices, largely because it has an established relevant scientific community to support and sustain them.

There are many other elements of a discipline, including career paths, organizations, publications, and teaching structures. What makes them relevant and valuable, however, is that they emerged from the judgment and efforts of a well-defined scientific community and its peer-review functions. Indeed, it is peer review that in many instances has led to the creation of a particular career path, or to the emergence of a journal as a significant leader in the field. If we are convinced by the success of peer review in creating disciplines, then the trick for designing successful interdisciplinary programs is to develop an effective analogue for the peer-review function and the institutions, structures, and practices that grow up around a discipline with a relevant scientific community.

Peer Review and Consent of the Relevant Community

It makes sense to consider why a discussion about the role of the discipline is necessary at all. What is the nature and power of a discipline as a means to organize scholarly work and careers? To be “interdisciplinary,” scholarship and research require a base of disciplines that may be connected, drawn upon, or interfaced in some way. But the attraction of interdisciplinarity seems to be more than merely combining insights, methodology, or data. Often, the essential question seems to be: what is interdisciplinary work breaking free *from*, and what are the consequences of that breach? The functions and outcomes of disciplinary scholarship and teaching offer some additional perspectives on how to make interdisciplinary work successful, and how to build effective interdisciplinary programs.

Disciplines have evolved as the organizational structure of the academy based on the need to make judgments about scholarship. While individual scholarly work is a creative act by the individual, the building off a body of scholarship is a group process. Some mechanism is needed to make judgments about the quality, the integrity, and the coherence of individual work. This integration of individual scholarship is achieved largely through peer review, in which judgments about scholarship are made by a community of scholars. A discipline can be defined, in part, as the knowledge, experiences, and codes of behavior—the processes of training, socialization, exchange, self-evaluating interactions, and so forth—held in common by this peer community.

By organizing knowledge into disciplinary units, both scholars and the larger community have gained several important benefits:

- Intellectual integration—theories and frameworks to help link pieces of knowledge together into larger patterns;
- Methods of observation, instrumentation, and exchange of knowledge that can be trusted and evaluated under common metrics;
- Modes of gauging authenticity and validity of knowledge-gathering that can answer contested claims;
- Means of assuring the independence of knowledge-gathering from threats of ideology, personal interest, and other inappropriate conflicts.

Peer review, and the disciplinary structure that comes with it, provides ways of integrating knowledge and making judgments about the validity and reliability of new pieces of knowledge within that framework. And it does more. Peer review bolsters academic freedom. Academic freedom, in turn, provides an authoritative means for making judgments about knowledge that is in the public interest, and relatively independent of powerful interests. These judgments could be political, which explains the concern within the academy in seeking to establish the plausibility of claims that presidential administrations have rendered decisions on (and affecting) science not on scientific standards but on political ones. Knowledge judgments could be based on

profit motives, explaining the sensitivity of medical journals to ensure that sources of financial support for research are duly revealed. Of course, that independence is contested in numerous ways, if for no other reasons than that disciplines have collective interests of their own.

However imperfect, peer review and academic freedom are surely better than the risk and uncertainty attendant to the generation of new, typically highly specialized, knowledge without awareness of how others with expertise in the area assess the work—not only the conclusions reached, but also the methods by which the conclusions were obtained in the first place. The advantage of housing so much of this knowledge generation within the academy is that the academy, itself, has incentives to ensure that this process is followed within the discipline/department.

There are, however, disadvantages to an academy built on disciplines. Most commonly cited are the obstacles that disciplinarity can pose to interdisciplinary scholarship. It is often difficult to establish interdisciplinary programs in the face of discipline-based functions such as promotion and tenure review, which can become enormously complicated by the different standards brought to bear by different disciplines. Economists, for example, might focus on citation counts while anthropologists favor candidates who do intensive field work using multiple languages. Another obstacle involves the changing criteria for what constitutes a discipline. Few political scientists question that voting behavior is a mainstream field of study today, but its incorporation into the political science mainstream was resisted when it was imported from communication and media studies (Lazarsfeld) with the help of psychologists (Campbell) and sociologists (Lipset).

Interdisciplinary scholarship raises a number of issues in this regard. The most immediate is, how to judge quality in a field of research or teaching that lacks sufficient means to conduct effective peer review? Do they yet have the knowledge base, the agreement on methods of inquiry, and the range of expertise from others to judge one another reliably? But further, the creation of a new interdisciplinary area of inquiry raises other, second-order questions. How does one find an audience (or, perhaps better, the correct audience) for the scholarly product? How are the career-building incentives to conduct such inquiry within a discipline to be replaced in an interdisciplinary setting? How does one define “quality research” in an emerging interdisciplinary field? The discipline provides one set of answers to these questions: to construct a viable interdisciplinary unit, practitioners must find ways to provide the interdisciplinary equivalents for these standards.

Reasons to Transcend Disciplinary Boundaries

The disciplinary unit can also pose constraints. Leading scholars in various interdisciplinary ventures consistently report that the contribution of their particular discipline to research problems that interest them is insufficient; they are not able to conduct the kinds of research they want to pursue because their research question

does not fit comfortably within a single existing discipline. The charge that a discipline is too narrow depends partly on the problem one is interested in studying, and partly on the methods, data, and analysis used to elucidate it. For example, Richard Fenno—whose interest is the study of Congress (or, as he put it, the place “where democracy happens”)—was able to fit a large and evolving set of research questions comfortably within political science. One might say that Fenno’s typical method of in-depth interviews and observation (what he calls “soaking and poking”) reflects political anthropology, but his use of traditional qualitative research to address core questions about democracy enabled him to pursue his research questions comfortably within the political science discipline. In his case, the substance is simply core to the discipline.

In other cases, the concern is whether the methods are appropriate to the discipline. Economics, for example, was originally skeptical of the use of laboratory experiments in advancing knowledge in their discipline. They have now become a significant component of economics research, but interestingly enough, the economics discipline has altered the standard laboratory experiment protocol of psychology (from which this impetus emerged) to impose a much stricter set of standards, such as to all but bar any degree of deception. Still others question the suitability of theoretical approaches—and when the new approach wins, it stands to provide another example for Kuhn’s scientific revolutions.

Any strategy to define a relevant scientific community will create boundaries that enable some research questions and inhibit others. The problem is not that academic scholarship is confined to traditional disciplines. The challenge is to find strategies to support non-traditional research that transcend disciplinary boundaries—a challenge that has given rise to interdisciplinarity.

Nothing works better in scholarly and scientific research—interdisciplinary or otherwise—than people who care about it. All the successful examples of interdisciplinary research cited here are animated by scholars, students, and scientists who want to know something.

It may seem self-evident, but it is worth repeating: nothing works better in scholarly and scientific research—interdisciplinary or otherwise—than people who care about it. All the successful examples of interdisciplinary research cited here are animated by scholars, students, and scientists who want to know something.

University administrators may, however, have a salutary influence on the direction and health of interdisciplinary research programs by considering where such programs are located. That is to say, some intellectual arenas seem to have an affinity with particular administrative units. Policy research often finds its home in professional schools; identity-based endeavors in liberal arts colleges (meant both as units within universities, and as liberal arts colleges, per se); methodology initiatives in cross-university, graduate-oriented programs. Since campuses differ in their organization, and opportunities arise spontaneously, the interest in various kinds of projects can

be lodged in a variety of homes, so the above are tendencies rather than directives. Nonetheless, the likelihood that particular kinds of projects appeal to particular kinds of actors and audiences should be a factor in administrative decisions about what to fund and where to locate it.

There are new approaches to knowledge that may change the conditions that underpin disciplinary work. New social technologies made possible by the Internet may allow us to supplant conventional means of peer review, in which small numbers of scholars (e.g., three “blind” reviewers) make judgments about others’ work. Ideas of “soft peer (i.e., distributed) review” and experiments such as Wikipedia point in directions that may open up the disciplinary boundaries.

New cross-institutional tasks, such as Institutional Review Boards to examine the protection of human subjects involved in research, may provide new models for peer review that focus on specialized components of scholarship. We may learn to disaggregate “peerness,” and scholarly work may become accountable to one set of peers for methodological approach and another set for content.

Finally, in this study we have found, as others have, that there is far less trade-off between excellence in disciplines and excellence in interdisciplinary research than is commonly thought. It is widely believed (or, at least, often said) that because current ranking systems are biased in favor of disciplinary research—both the National Research Council and *U.S. News and World Report* typically rank by discipline—there is little incentive, and often important disincentives, to support interdisciplinary research. However, it is commonly believed that the strongest disciplinary scholars are the base on which the highest quality interdisciplinary units are built. As a result, the potential tradeoff between disciplines and interdisciplinary units is at least attenuated, such that innovative interdisciplinary research programs are often found on campuses with the strongest disciplines as well. Certain educational programs, like interdisciplinary Ph.D. programs, may meet skepticism concerning the existence of a robust job market or quality control across interdisciplinary training. But these initiatives do not seem to weaken—and may even strengthen—the disciplinary programs upon which they are typically built. Indeed, exposure to different communities of practice and to different styles of disseminating research may well enhance both the quality and the impact of research across the board, as Diana Rhoten (2004, 10) suggests:

In the current academic structure, the value of research and researcher alike is usually measured by the production of new knowledge in the form of publications in academic journals. However, information sharing networks may often yield “harder to count” but equally important—albeit different—outputs, such as Congressional testimonies, public policy initiatives, popular media placements, alternative journal publications, or long-term product developments.

Motivation: Reflections of Interdisciplinary Scholars

We can think of any given interdisciplinary initiative as a combination of means, methods, and motivations. The motivations come from all interested parties, of course, but two considerations seem essential. The first is a necessary condition: that there be scholars motivated to spend their most valuable resources—their time, energy, and thought—on some interdisciplinary problem or project. The second is that their incentives must be made at least reasonably compatible with those providing the resources. Whether support comes from an external source, such as a private foundation or a government agency, or from sources internal to the college or university, the methods for aligning the resources with the needs and interests of the scholars is an area in which the internal administration can prove useful.

To begin at the beginning is to understand the motives of those involved. One way to do this is to ask those who have been involved in exemplary cases of interdisciplinary teaching or research. To support our investigations into interdisciplinary practice, the Task Force conducted interviews with a number of such major figures: David Easton, R. Duncan Luce, and Suzanne and Lloyd Rudolph, looking back at their projects in the first decades of the post-World War II period; Robert Axelrod and Phil Tetlock, among others, from more recent decades; and participants in a round table on interdisciplinary teaching.

Lessons to be drawn from these include:

- Thinking about interdisciplinary issues is almost impossible except in the context of substantive, intellectual issues;
- The intellectual projects that were derived from the larger social and political forces of the time, which helped to shape the subjects of their interdisciplinary scholarship, owed a great deal to the private foundations and the governmental forces we describe in the larger report, and this was understood by the principal scholars involved. Indeed on occasion, scholars played roles in defining these projects;
- There is great variety in the academy in their response to the interdisciplinary forces (intellectual and practical), with some universities and some individuals offered more congenial settings for the interdisciplinary work to flourish than others;
- These individuals saw the disciplines and those whose work was comfortably within a single discipline as at least confining, if not outright hostile to, interdisciplinary work.

The motivations for doing interdisciplinary work among the scholarly community are typically self-generated. The ability to act on them, however, almost invariably needs some form of support, whether from the college or university itself or from an external funding agency such as a private foundation or government agency. This is

more narrowly true of interdisciplinary than disciplinary projects for several reasons. First, many such projects are initiated with a set of scholars from a variety of disciplines. Those are cases that do not really fit into established categories and thus are difficult, if not impossible, to generate from traditional resources available for a disciplinary project. Second, they also tend to loom large in the life of involved scholars, because entering into an interdisciplinary project for the first time requires learning several different literatures, at least some of which are remote from the discipline in which the scholar resides. They typically involve more than one scholar from more than one discipline, and additional time is required to enable full research communication for each to learn the other's "language," methods, and manners of conducting research. Third, everyone involved must learn not only about the problem but also how to make their own assessment of the teaching or research product long before they seek to convince a potentially skeptical, or at least untutored, set of scholars that it is indeed of high quality.

As a result, exogenous funding becomes critical to enable new interdisciplinary projects to begin, let alone to succeed. As a result, the question is how to get the motivations of the internal or external funding agency to align sufficiently with the motivations of the scholar. The funder might provide funding for a specific project. As we turn, therefore, to assess the means of interdisciplinary research and teaching, it is important to examine the motivations of those who are the source of project support. Only when the interests of both the scholar and the funder are served is there effective support for interdisciplinary practice. The academy and the funding foundation or government agency must interact in such fashion that this common ground is established. The funder then proposes programs based on input about what the academy might find interesting and important, and the scholars then may select from the various ideas they find interesting and from the important lines of research that can win support from external funding agencies.

PART II. External Drivers of Interdisciplinary Practice: From Private Foundations to Federal Funding

Private foundations, more so than any other type of institution, launched the interdisciplinary agenda for the social sciences in the early half of the twentieth

Private foundations, more so than any other type of institution, launched the interdisciplinary agenda for the social sciences in the early half of the twentieth century.

century.² The role of foundations remained substantial in the second half of the twentieth century, and perhaps even more interesting, they continue to shape interdisciplinary objectives

in the academy into the twenty-first century. They were particularly consequential in launching and sustaining two aspects of what we call the "national project": area and international/security studies, and policy studies.^{3,4}

Of course, this “national project” was core to the interests of the federal government. Thus, more recently, the federal government has come to play a role at least as great as—and we believe, greater than—the role of private foundations, although foundations remain important players. To the federal government (especially the NSF, although for many social and behavioral science disciplines, the NEH and the NIH were only modestly less importantly), interdisciplinary research during the second half of the twentieth century was an important part of the “science project.” By that we mean that the NSF, in particular, saw the development of rigorous scientific practices in the social and behavioral sciences as important in its own right. Heretofore, when external funding agencies supported methodological works and other aspects of building a stronger scientific base, they did so for extrinsic reasons: doing so would strengthen the ability of the social and behavioral sciences to address pressing social problems (such as those composing the “national project”). The NSF began to see strengthening social scientific work as a valuable end in itself (or, perhaps better put, sufficiently important for addressing whatever problems the social and behavioral sciences would be addressing over a broad range and for a long period of time). The federal government, especially the major agencies of the National Science Foundation, National Endowment for the Humanities, and National Institutes of Health, emerged in this period (for the social sciences) as the major partner to individual or groups of scholars banding together to pursue interdisciplinary science projects. We present this story from the perspective of influential individual scholars and also from the perspective of the partnership between the scholar and the federal agency.

Foundations Support the “National Project”

The Russell Sage Foundation sought to support interdisciplinary research within a few decades after the founding of many of the academic disciplines (i.e., many disciplines trace their formal origin to the end of the nineteenth century). Their purpose was to solve pressing social problems and they believed that no one discipline offered the appropriate set of questions, tools, and methods to address complex social concerns. They, and then the Rockefeller Foundation, did not, of course, operate in a vacuum. They did so in full understanding of the government, and President Herbert Hoover lent his support to a major Rockefeller Foundation initiative. Moreover, the actions of the foundation were not simple external inputs defining opportunities for scholarly research. In many cases, scholars themselves played key roles of intellectual leadership in defining the mission of various foundation-supported projects.

The establishment of geographical area and international studies were originally supported with philanthropic funds from the Rockefeller, Carnegie, and Ford Foundations. By the late 1950s, both (and especially area studies) led to among the most far-reaching interdisciplinary projects in American higher education. Area studies were largely institutionalized outside of disciplinary departments, almost

of necessity. The idea behind area studies was the conscious intent to bridge the social sciences and the humanities—for example, interweaving religion, history, and social science. As Suzanne and Lloyd Rudolph noted in their interview, those in the American academy who studied the United States (and often Western Europe) were advantaged by backgrounds that included an understanding of language and history and culture. Those of American or European background interested in area studies rarely had that sort of basic understanding. Indeed, the area studies project was precisely intended to develop such understandings and to draw knowledge and make connections between language studies and the analysis of non-American societies, polities, and economies.

Much like the social sciences of the first half of the twentieth century, area studies had an internal and an external agenda: internally, they sought to develop deeper understanding in the manner of what was earlier called the science project; externally, they served the national project. The foundations were willing to offer such heavy investment in area and international studies under the explicit justification of projecting American and the West's expertise and strength to combat the efforts of the Soviet Union after World War II. Once again, it is easy to trace the influence of foundation funding on the establishment of an ambitious interdisciplinary project in area studies that had national project purposes, especially national security purposes. The same is even more true of international security studies during this period, which brought together physical sciences (particularly physics and engineering) and the social sciences (particularly political science). No single discipline was considered broad enough to be the only home of security studies. Propaganda analysis needed the attention of psychologists and communication experts as well as political scientists; arms control needed the attention of physicists and lawyers and engineers as well as political scientists.

Federal Funding Takes the Lead

From a “follow-the-money” perspective, it is the beginning of federal funding that has had the most striking impact on interdisciplinary research. The 1958 National Defense Education Act (NDEA) was central to, with Title VI being the locus for, the most important development of area studies. As the Department of Education website⁵ notes:

NDEA aimed to ensure trained manpower of sufficient quality and quantity to meet the national defense needs of the United States. Title VI was the “Language Development” section of this act, focusing on uncommonly taught languages. It supported language area centers for expansion of postsecondary instruction in uncommon languages and related subjects, modern foreign language fellowships, research supporting language learning methodology and specialized teaching materials, and language institutes to provide advanced language training.

Title VI and Fulbright-Hayes funding became important to university area centers in the years following Sputnik, and in amounts that began to outpace private philanthropy. The rationale for this investment of tax-payer funds in the social sciences and humanities was not in doubt: to help the nation outmaneuver the Soviet Union, and communism more generally, across the new nations of Asia, Latin America, and Africa. Today, learning more about the Islamic world justifies increases in federal funding for international studies and foreign language training.

While the national project was an immediate and obvious source for government funding for interdisciplinary work, the Cold War offered justification for a more general base of support for research in the academy. The NSF became, for many natural, social, and behavioral sciences, the most important source of funding for research by far, while those whose work is in the area of health say the same for NIH and those in the humanities for NEH. The NSF is instructive in that it is, by design, something of a mirror

The NSF became, for many natural, social, and behavioral sciences, the most important source of funding for research by far, while those whose work is in the area of health say the same for NIH and those in the humanities for NEH.

of the research university. That is, much of the NSF is organized along disciplinary lines, combined with at least some interdisciplinary units that reflect durable cross-disciplinary concerns (e.g., the Methodology, Measurement, and Statistics Program). Some of its most innovative initiatives are organized at a higher administrative level, one that is at least multi- if not more often truly interdisciplinary. Thus, such important innovations in support for instruction as the Integrative Graduate Education and Research Traineeship (IGERT) initiative and the Human and Social Dynamics program for research are genuinely interdisciplinary in their design and in the projects they support. Those who developed those and other such programs see interdisciplinarity in much the same way as its academic advocates do, as the locus of innovation and dynamism in knowledge. Of course, most NSF (NIH, NEH) leaders were recruited from the academy. Especially with the NSF also organized in ways that are at least similar to the academy, it is no surprise, then, that it reflects, at its best, the best of what the academy would like to achieve. We consider these in more detail below.

Growth of the Policy Studies Industry

The growth of a policy industry is another great interdisciplinary project that began in the second half of the twentieth century and that continues into the twenty-first. Its roots stretch back to the 1920s when the Brookings Institution, the National Research Council, and the National Bureau for Economic Research arose as prominent forerunners.⁶ Policy studies gained momentum through the Great Society initiatives of the Lyndon Johnson administration with the emergence of think tanks, public policy schools, survey research houses, and contract researchers. Initially, funding was primarily philanthropic, but federal funding grew in importance with the arrival of large data sets—the social

experiments in housing, health and income maintenance, and the longitudinal studies in education and employment. More recently, foundations have gained prominence as

The growth of a policy industry is another great interdisciplinary project that began in the second half of the twentieth century and that continues into the twenty-first.

funders, although now we note the role of conservative foundations (Olin, Bradley, Scaife, etc.) in funding policy analysis and advocacy that often supports market liberalization, a reverse of the direction of Great Society programs.⁷

Our purpose here is simply to underscore three of the public policy industry's features:

- First, the public policy industry is large and growing. There are, for example, 70 statistical agencies and programs in the federal government churning out data on the economy, education, crime and health, and using private contractors to collect and analyze these data, including university centers (NORC, ISR, Institute of Poverty Studies, and numerous others) as well as non-profits (RTI, Mathematica, Rand, AEI, and numerous others) and for-profit firms. Public policy focuses on population groups: veterans, low-income families, drug addicts, preschool children. The making of public policy requires knowing the numbers and characteristics of any group that is the subject of policy. The industry, then, is empirical in its basic methodology, and university centers and non-profits are noteworthy for their contributions to the development of social science methodologies. Thus, the industry serves the science project, and includes in its sweep most of the “big social science” projects (that is, the American National Election Study, the General Social Survey, and the Longitudinal Study of Income Dynamics).
- Second, the public policy field is interdisciplinary. There is a heavy presence of economists, hundreds of political scientists and sociologists, numerous historians and psychologists, and professionals with public health training, graduates from schools of education, engineers knowledgeable about energy and the environment, and many others. Many policy industry workers have an M.A. or equivalent from a public policy school or program (and perhaps other advanced degrees); programs now number well over a hundred, with new ones being formed every year.
- Third, this industry is about designing, implementing, and assessing policy interventions. Of course, such an agenda includes dismantling old policies to make more room for new ones. While the creation of policy interventions by government was originally the very definition of liberal, the rise of the neo-conservatives in the 1970s in reaction to the Great Society-style policy programs often led to dismantling the old “liberal” policies and replacing them with a variety of more free enterprise economy approaches (e.g., “back to work” welfare reform, school reform based on vouchers and free choice, and other

contracting out and privatization approaches). Today's public policy is, thus, a more balanced, if not neutral, enterprise. The more important point is that the funders of policy research and program evaluation—liberal or conservative, philanthropic or government—invest for a national project reason: to solve a social problem (in the earlier vernacular) and not to build a better science directly. In the policy studies areas, the science project tends to remain justified as the means to achieve better understanding of the national project.

Government Support for Interdisciplinary Research: The “Big Three” Agencies

While the foundations continue to provide considerable support to the social science academy, the federal government has become the go-to source for political science, primarily through funding from the NSF. Today, the “big three” agencies—NSF, NEH, NIH—define the terms for central directions in interdisciplinary research. They also support “big” social science—and they support the “science,” that is the science project, rather than being limited to supporting the social and especially the national project as the first goal. The federal government provides vast support for the study of various public policies, and public affairs issues. However, the work of the NSF, NEH, and NIH is sufficiently different from, and has had different sorts of effects from, the private foundations that we study these three in detail.

*National Science Foundation*⁸

The National Science Foundation uses three mechanisms to promote interdisciplinary research. These are co-reviews between disciplinary programs, standing cross-disciplinary programs, and special funding opportunities.⁹ These approaches work with varying degrees of success. While some encourage interdisciplinary research, others tend to create havens for multidisciplinary research.¹⁰

The most common way NSF encourages interdisciplinary research is through the use of co-reviews between disciplinary programs. In the most recent listings of awards by the political science program, more than one in four were supported by at least one other NSF program.¹¹ A proposal can only be submitted for consideration to one program at a time. When submitting a proposal, the principal investigator or investigators can choose to ask for a co-review with one or more programs. In addition, the program officer to whom the original proposal has been submitted can independently decide to share it with one or more programs. If the offer of a co-review is accepted by the other programs, then the proposal is reviewed by each program. Each program can choose ad hoc reviewers to consider the proposal and are considered by each program's panel. At the end of the process, the program officers from the various programs decide independently if they will fund the proposal. If more than one officer decides to fund a proposal, then the programs split the funding.

In some cases, this method funds truly interdisciplinary research. However, in others, the panels' recommendations reflect those of their disciplines and do not

consider the interdisciplinary merits of the proposal effectively. For a typical example, the Economics Advisory Panel evaluates a proposal on the basis of its contribution to economics. The Political Science Advisory Panel evaluates that same proposal on the basis of its contribution to political science. In these situations, proposals are regularly criticized because they do not reflect work primarily within a program's discipline. Thus, while co-reviews can result in the funding of interdisciplinary research, it can also work against interdisciplinary proposals. This reflects problems we will consider later in examining how scholars and their interdisciplinary work in the academy are evaluated—a special concern in promotion and tenure decisions.

A second method of promoting interdisciplinary research is through the development of programs that cross traditional disciplinary boundaries. In the Division of Social and Economic Sciences, these would include the Decision, Risk and Management Science, Law and Social Science, Measurement, Methodology, and Statistics, and Science and Society programs. The Science and Society program is a typical example of a cross-disciplinary program; it regularly considers proposals involving historians, natural scientists, and others involved in the study of the development of science and its impact on society.

Does this method promote interdisciplinary research? These programs vary in their ability to promote interdisciplinary research. For example, the Law and Social Science program is not interdisciplinary in nature. It is more aptly described as a multidisciplinary program. While scholars who receive support are from a number of disciplines, such as anthropology, criminology, law, political science, psychology, and sociology, very few proposals are considered that are truly interdisciplinary. Instead, the focus is on research in single disciplines. The same can be said, to different degrees, for each of the other programs. For instance, proposals in the Decision, Risk and Management Science program tend to follow the disciplinary lines of economics or psychology. Such multi- but not (often) inter-disciplinarity may have indirect effects on achieving interdisciplinary goals, such as communicating disciplinary-based research to other disciplines. But those effects are generally indirect. On the other hand, the Methodology, Measurement and Statistics program primarily supports research that is interdisciplinary in nature. For example, many of the proposals supported by this program consist of work in statistics and a social science discipline where new methods are being developed to examine a disciplinary subject. In this case, “interdisciplinarity” has a specific meaning: the focus is on the tools to do research instead of actually melding disciplines on theory or substance. Some of the most successful interdisciplinary programs in the academy involve creating and communicating such tools of common utility across the social and behavioral sciences.

The third way that the NSF encourages interdisciplinary research is through the establishment of special initiatives. These initiatives usually require a team of scholars from several disciplines to be involved in the project. In addition, scholars must be working as an interdisciplinary team in order to be funded. One such initiative is the

Human and Social Dynamics competition, which requires each proposal to have at least three senior personnel who must be drawn from at least two disciplines. The research itself must integrate the approaches of the various disciplines involved.

Does this method promote interdisciplinary research? In most cases, it does. For example, in the Human and Social Dynamics competition, it is not enough to have scholars from various disciplines examine the same topic; they must examine it in a unified manner. Competitions such as this one routinely decline proposals where the research is not truly interdisciplinary. This mechanism seems to be the most successful for funding interdisciplinary research of the three approaches.

*National Endowment for the Humanities*¹²

The National Endowment for the Humanities (NEH) was created by the 1965 National Foundation on the Arts and the Humanities Act, and is an enduring expression of Lyndon Johnson's Great Society vision. The Act does not attempt an explicit definition of "the humanities," and political science is not mentioned by name. Disciplines explicitly referenced in the legislation include the "obvious" humanities disciplines of history, literature, and philosophy, but also include some that usually are not thought of as core humanities disciplines, such as linguistics, archaeology, and jurisprudence. In addition, the Act extends the agency's purview to "those aspects of the social sciences which have humanistic content and employ humanistic methods." Over the years, the agency has generously supported projects in political philosophy—and particularly in American constitutional law—a practice that has not been especially controversial.

NEH grant-making activities are organized along functional lines. This makes the agency somewhat distinctive¹³ and offers the advantage of accommodating interdisciplinary ventures without privileging them. For example, instead of having separate offices (or directorates), for each of the constituent disciplines of the humanities, the NEH has a research division that awards fellowships and summer stipends to individual researchers in all fields; it also awards project grants to institutions, typically universities or colleges, for collaborative research of all kinds, including the production of scholarly editions. The agency also has divisions that support preservation and access (including the creation of reference works and databases); education (professional development programs for college and high school faculty members, for example); public programming (such as museum exhibitions and documentary films); humanities programming undertaken by the several state humanities councils; and challenge grants in support of durable institutional improvements in the humanities.

Under the leadership of art historian Bruce Cole, the most recent preceding NEH chairman, Congress also has supported activities in pursuit of the agency's We the People initiative, which is intended to strengthen the teaching, study, and understanding of American history and culture, including the U.S. Constitution and political institutions¹⁴.

NEH grants are awarded competitively, and the review process is a complicated one in which disciplinary expertise is brought to bear on grant applications—though never formally or officially. Review panels are created on an ad hoc basis; there are no standing panels at the NEH. Generally speaking, the “disciplinarity” of the evaluation process is commensurate with the number of applications under review in a particular grant program. In a high-volume program such as the competition for NEH Fellowships, for which some 1,400 applications are reviewed each year, peer review typically will be organized along conventional disciplinary lines. In fact, the Fellowships program often uses two panels in political science, one that reviews applications for Fellowships for University Teachers, the other for Fellowships for College Teachers and Independent Scholars. This distinction, in turn, reflects the great variety of environments in which scholars in the field conduct research.

While the NEH has no particular stake in conventional ideas about how the various disciplines within the humanities ought to be defined or structured, the Endowment has, for the most part, found it prudent to honor the prevailing definitions and structures. Even a cursory glance at an NEH award list reveals steady support for political science as that field is conventionally conceived.¹⁵ For example, the NEH has done well by the history of political philosophy (itself a profoundly interdisciplinary undertaking), and through the years has regularly supported public law and jurisprudence projects.

As one might expect, NEH funding patterns do not reflect the high level of professional interest in staples of the political science program at NSF, such as rational choice theory. There is little doubt that this is because reviewers typically regard it as less “humanistic” than historical or philosophical approaches, and also because the NSF is seen as the more appropriate supporter of mathematical and empirical studies. Policy studies, too, are rarely supported by the NEH. Thus, NEH practices and awards do not easily follow the “science project” or the parts, at least, of the “national project.” But there is a clear national project aspect (e.g., the We the People project) and a clear science-like project (e.g., durable institutional improvements in the humanities projects and others that have intellectual institutional aspects at their center rather than solutions for a specific social problem).

To say that the NEH has generally deferred to conventional academic categories is not to say that the agency has discouraged work that crosses disciplinary boundaries. Pursuant to its institutional mission, which includes the creation of knowledge, the agency has sometimes invested in inter- or trans-disciplinary ventures that have had real potential for disciplinary boundary revision, or even erasure. Note that the NEH sponsors annual sets of Summer Seminars, which are highly interdisciplinary and overlap with political science (e.g., a recurring seminar on the civil rights movement, which involves mass participation, federal-state relations, and the law, *inter alia*; a seminar on Race, Class and Gender in the Labor Movement; a variety of seminars

on specific political theorists such as Machiavelli). These not only support ongoing research by faculty at non-Ph.D.-granting institutions, but they support faculty development in teaching for those faculty as well.

If the subject of “interdisciplinarity” in teaching and research seems particularly salient these days, it may be because advanced information technology is revolutionizing the way that primary sources are accessed, and the ways that knowledge in the humanities is produced and disseminated. Accordingly, the NEH recently mounted a Digital Humanities Initiative that reflects the agency’s interest in “lending support to a wide variety of projects, including those that deploy digital technologies and methods to enhance our understanding of a topic or issue; those that study the impact of digital technology on the humanities—exploring the ways in which it changes how we read, write, think, and learn; and those that digitize important materials thereby increasing the public’s ability to search and access humanities information.”¹⁶

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National Institutes of Health

The NIH presents a third way to organize federal support for academic scholarship. In this case, the NIH is more like the private foundations. That is, it is organized along “health problem” lines (adapting our terminology). The NIH provides a truly impressive amount of support for academic research. The primary beneficiaries of this largesse are, of course, the biological and medical communities. However, it also offers a very large base of support for the behavioral sciences, especially in psychology, and for the social sciences in sociology (through demography and health sociology), economics, and public policy. Relatively few political scientists are applicants, let alone recipients, of NIH grants. Ken Shepsle has a five-year “pilot” RO1 grant (a primary vehicle for scientific research in the academy) for his work on intergenerational relations. Gary King has been a project leader on a P01 (large, multi-investigator grant) as well as on some smaller grants. These, however, are among the few specific examples. It remains a potentially valuable resource, especially for those interested in health policy, demographic research, the politics of aging, and similar fields.¹⁷

The NIH offers greater resources (often considerably greater resources) than the NSF for those doing research or teaching in areas the agency supports. It is like NSF and NEH in that it places much greater emphasis on the “science project” than does the typical private foundation. Indeed, those in the primary fields of its focus often rest their entire academic careers, centrally “science-project” oriented, on NIH funding.

Note that while the NIH is perhaps most evidently designed in ways similar to the research university, as the above attests, all three agencies reflect and respect disciplinary

boundaries and yet also, not unlike the contemporary university, actively seek ways to attack new problems or do so in new ways through interdisciplinary efforts.

Institutions Designed to Foster Interdisciplinary Research into the Twenty-First Century

As the twentieth century came to a close, the role of not-for-profit and non-governmental organizations became increasingly important in research and advocacy. This suggests that interdisciplinary research takes place in many other places, often in long-established locales such as the Social Science Research Council, the Rand Corporation, the American Enterprise Institute and the Brookings Institution. Global venues include the United Nations Development Programme, the World Bank, and newer entrants like the Santa Fe Institute, the Center for Global Development, the New America Foundation, the Project for the New American Century, the United Nations Environment Programme, and the World Resources Institute.

It is useful, however, to consider what the *intellectual* drivers of interdisciplinary research seem to be, and how they are reflected in institutional expressions, such as policy arenas, programs emerging from political movements and social justice concerns, world geography and culture, and methods and methodologies. Naturally, these are not mutually exclusive; former APSA President Robert Axelrod's web site, for example, describes his current research interests as including both "complexity theory (especially agent-based modeling), and international security,"¹⁸ questions of both methods and policy that require interdisciplinary work.¹⁹ Nonetheless, focusing on the distinctions reveals interesting patterns. It appears, for example, that initiatives emphasizing different focal points can be broadly identified with particular historical moments: for example, policy issues in the first half of the twentieth century, area studies in the 1950s and 1960s, identity programs in the 1970s and 1980s, methods in the 1990s (particularly as new computing technologies permit new kinds of data analysis). Moreover, different focal points seem to be located in different places on campuses: for example, ethnic studies in undergraduate programs, area studies in graduate programs, policy arenas in professional schools or methodological approaches in broad cross-institutional initiatives. Note, however, how close are the interdisciplinary links which tie social science disciplines with the agendas of such professional schools as public policy, public health, and business.

The Task Force report offers some pertinent comments on these issues.

Policy Arenas

Policy issues have been a feature of research and education in the United States since the development of the modern research university in the late nineteenth century—urban planning, public administration, industrial organization, for example, all reflected concerns with the policy dilemmas of the Progressive Era. In the early years of the modern university in the United States, the disciplines themselves evolved to

address these concerns—the disciplines of sociology, political science, and economics were designed to explore the challenges of immigration and urbanization, democratic government, and capitalist industrialization. During the twentieth century, professional schools developed at universities to train not those who practiced in these policy realms, but those who studied in them. Thus schools of social work, public health, education, business, and public administration arose to assemble and apply the findings of research done in varieties of disciplines, and to foster applied research about the policy issues under scrutiny.

Perhaps as a result, professional schools serve as one of the major institutional locations for interdisciplinary research on policy questions. Not only do professional schools of public policy—such as Harvard University’s Kennedy School of Government or Princeton’s Woodrow Wilson School of Public and International Affairs—house and foster interdisciplinary research, but other schools—business, public health, education, urban planning, social work, and others—also encourage interdisciplinary research by their faculty in a variety of policy arenas.

Perhaps as a result, professional schools serve as one of the major institutional locations for interdisciplinary research on policy questions.

In addition to these now-institutionalized mechanisms for interdisciplinarity (where “institutionalized” might be defined as “headed by a dean or director”), there are centers that extend across campuses to involve more than one school or department, such as Columbia University’s Earth Institute and Yale’s Center for Interdisciplinary Research on AIDS. Consider, for example, Duke’s Global Health Institute, which has certificate programs at both the graduate and undergraduate level. (Certificate programs provide additional, and often more-advanced course work than training offered within a department.) Its program descriptions serve as a good illustration:

The Global Health Certificate Program aims to develop future leaders with tools both to synthesize current knowledge in new ways and to formulate innovative solutions to achieve improvement in the quality of health for underserved populations. Students work in interdisciplinary teams to learn how to make significant contributions to the current challenges facing the world today, while also understanding the ethical concerns of working across cultural and economic boundaries.²⁰

The Global Health Certificate Program capitalizes on Duke’s diverse strengths in medicine, law, nursing, engineering, the environment, and business, as well as its broad Arts & Sciences base to bring together faculty and students from across campus. In short, the Global Health Certificate Program spans the continuum of basic sciences to applied sciences, resulting in an interdisciplinary approach to global health that fits with the University’s educational mission.

According to the description, program objections include preparing certificate students to:

- Implement interdisciplinary approaches to Global Health problems;
- Recognize high-quality research methods, evaluate the validity of qualitative and quantitative research, and identify the methodology appropriate to answer specific global health questions;
- Attain a high degree of competency in developing team work skills and negotiating group-based power dynamics during interdisciplinary team projects and presentations;
- Identify major ethical challenges in Global Health and discern potential concerns about their own cross-cultural work.

Some policy research combines interest in methodological innovation with policy impact. MIT's influential Abdul Latif Jameel Poverty Action Lab (J-PAL), for example, describes itself as serving "as a focal point for development and poverty research based on randomized trials. The objective is to improve the effectiveness of poverty programs by providing policy makers with clear scientific results that help shape successful policies to combat poverty." J-PAL illustrates a feature of policy research that is unusual in other interdisciplinary programs: among its collaborators are "NGOs, international organizations, and others [who] evaluate programs and disseminate the results of high quality research."²¹

The Stanford-based Center for International Security and Cooperation (CISAC, formerly the Center for International Security and Arms Control) offers a similar description as "a multidisciplinary community dedicated to research and training in issues of international security [that] brings together scholars, policymakers, area specialists, business people, and other experts to focus on a wide range of security questions of current importance."²² The work at CISAC, like that at J-PAL, combines multi-investigator research projects as well as research projects undertaken by individuals including graduate students.²³

Most policy research appears to be conducted by research scholars and scientists who already have most of the training they expect to acquire; pre- and post-doctoral fellowship programs are sometimes associated with these research centers, but the researchers themselves typically have conventional disciplinary training. In some cases, however, policy research has also driven the creation of new educational programs. For example, Columbia University's Ph.D. in Sustainable Development and Yale's Ph.D. in Bioethics are explicit efforts to integrate exposure to the natural and social sciences (in the first case) and to "the humanities and the empirical sciences" (in the second case). As the Bioethics program description notes: "The best empirical research in bioethics will always be based on a sophisticated understanding of the historical, philosophical, and cultural contexts of the delivery and consumption of health care services. Similarly, philosophical debate can often be enriched by an awareness of empirical data."²⁴ In both

cases the policy focus is designed to address practical problems and to transcend the variations in methodological traditions across disciplines.²⁵

While long a staple of advanced training in the sciences, post-doctoral fellowships are rapidly increasing in number and diversity across the social sciences. Such fellowships have been reasonably common in international studies programs for a good number of years. The role of post-doctoral programs for Fellows in the natural sciences is often to give them experience in a second laboratory. One role for post-docs in the social and behavioral sciences is to give them experience in a multidisciplinary setting, with the history of success in international studies as exemplar.

Finally, some policy-driven interdisciplinary programs have produced interdisciplinary undergraduate majors or concentrations. The Center for Environmental Studies at Brown University, for example, not only supports research on environmental policy but “hosts two concentrations, which are quite popular among undergraduate students [and a] Masters program that prepares students to address environmental problems of societal concern.”²⁶ The Urban Studies program at the University of California at Berkeley offers an Urban Studies major, housed in the Department of City and Regional Planning (DCRP) of the College of Environmental Design; it “seeks to introduce students to . . . historical and contemporary analysis of American and global urbanization, urbanism, urban societies, and urban political economies” as well as providing “conceptual tools, analytical methods, and theoretical frameworks to understand urban environments, such as economic analysis, social science theory, and visualization technologies.”²⁷

World Geography and Culture

Area studies in its modern guise developed a little later than either the disciplines themselves or the professional schools that arose to address domestic policy challenges in the United States. The appearance of area studies was a reflection of America’s rise to global power at the end of the World War II.²⁸ (This is reflected in the Rudolphs’ explanation of their research motivations, discussed during the interview conducted by the Task Force.) Designed to promote both research and (probably more importantly) the education of “experts” on relatively understudied regions of the world, the first programs were in Russian or Soviet Studies, established as the Cold War got underway in the late 1940s. By the early 1960s, the whole world, except North America, came under scrutiny as the independence of the states of Africa created the conditions for the development of modern African studies, joining the earlier appearance of European, Latin American, East Asian, South Asian and Middle Eastern studies. By that time, the need for area and international expertise had been recognized by the federal government; in 1958, the National Defense Education Act (NDEA) authorized, and paid for, the creation of what would become known as Title VI National Resource Centers to support a “foreign language, area, and international studies infrastructure” that would “ensure trained manpower of sufficient quality and quantity to meet the national defense needs of the United States.”²⁹

Borrowing from the humanities (especially language and literature programs) and from the social sciences (anthropology, history, sociology, economics, geography and political science), area studies integrated methods and literatures across a wide variety of disciplines. Several universities—Berkeley, Columbia, Harvard, and Michigan—grew to be particularly well known for both the depth and the breadth of their area studies programs. Throughout the Cold War, both the federal government and a number of the major private foundations in the United States (as well as private donors) provided generous funding for these programs. However, with the end of the superpower rivalry and particularly the demise of the Soviet Union, a number of area centers, notably those devoted to Soviet Union studies, found themselves directionless and uncomfortably marginalized. To some extent, this was true for the entire area studies enterprise. At Columbia, for example, the well-endowed W. Averell Harriman for the Advanced Study of the Soviet Union was constrained to change its name due to the disappearance of the USSR; after much debate it became, simply, the Harriman Institute. Many academics through U.S. universities concluded that area studies were passé. American triumphalism exhibited itself in a steep decline in concern with, support for, or enrollments in courses about foreign countries or cultures and “internationalization.” Then “globalization” overtook area studies as the means by which Americans understood phenomena like the prevalence of English in the new information and communication technologies (see Biddle 2002).

The University of Michigan’s International Institute was an early post-Cold War (1993) effort to preserve area studies programs (and the federal funding associated with them) and to extend and rationalize the reach of the University’s international programs. According to its website, the International Institute, which is “responsible for coordination of research and training in area, comparative, and international studies within the College of Literature, Science, and the Arts, as well as promotion of innovative collaborations in international affairs across the University’s schools and colleges,” enjoys a “unique” role in “supporting the development of contextual expertise in the liberal arts as well as in professional schools. It comprises one of the nation’s broadest assemblages of interdisciplinary centers and initiatives, including the University’s U.S. Department of Education-supported National Resource Centers in area studies and international business; other area studies, comparative, and thematic programs and initiatives; and publications; the Office of International Programs (organizing undergraduate study abroad and exchange programs) is an II affiliate.”³⁰

The assumption that serious interdisciplinary research is fostered by an administrative arrangement that subsumes interdisciplinary centers and initiatives with more mundane study-abroad programs was met with some skepticism, but Michigan’s design has become a model for other universities seeking to sustain the administrative structures dictated by federal funding, while also permitting intellectual innovation and agile response to other funding opportunities.³¹

In fact, however, academic social scientists who received their Ph.D.s in the last 20 years evince considerably less interest in area studies as an interdisciplinary project than do their advisors. Area studies programs have slipped away from the “hard” or quantitative social sciences—economics, sociology, political science—and most of the directors of Title VI centers today are historians, anthropologists, or humanists by training. In part this reflects a growing emphasis on research whose methods assume data that are not available or not reliable in non-industrialized countries, declining emphasis on foreign languages as a research skill in social science training, and increasing emphasis on time-to-degree in Ph.D. programs, which discourages significant field research.

Seen differently, however, it also reveals the extent to which the availability of funding—in this case, the Title VI federal government funding—prolongs a model of research that may not reflect the best estimate of university researchers about new fields of knowledge. Certainly in the aftermath of the attacks of September 11, 2001, universities and colleges across the country saw a major surge of interest in Middle Eastern studies and Arabic language among students, particularly undergraduates. But there was not a comparable influx of research faculty or graduate students into area studies programs; indeed, many of the research projects on, say, political Islam or on religion in international affairs, were funded by foundations and conducted by scholars who were not stalwarts of the old area studies communities.³²

Political Movements and Social Justice Categories

Insofar as area studies exhibited intellectual vitality, it was often because area studies were assimilated into categories driven by political movements and social justice, particularly by the undergraduates known as “heritage students,” who study a place or language they know only through their immigrant families. For example, one can see the connection clearly in the University of Illinois at Chicago’s Program in Latin American and Latino Studies.³³ This assimilation is also evident in the frequently close links of African and African-American studies.³⁴ These areas of study developed in response to the major social movements of the 1960s and 1970s, with the development of African-American studies and Women’s and Gender studies, and later Latino, Native American, Asian-American, Gay, Lesbian, Bisexual, and Transgender (GLBT) and, most recently, disability studies.

More than the other intellectual focal points of interdisciplinary research, political movements and social justice categories seem to be located in, or at least unusually accessible to,

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undergraduate programs. Perhaps because they are designed to serve undergraduates, these kinds of interdisciplinary programs seem to be more likely to be organized as departments within the arts and sciences, as opposed to professional schools, research

centers, or research-teaching hybrids. The well-known Wellesley's Women's Studies Department and the University of Colorado's Department of Ethnic Studies, which both offer undergraduate majors, are typical examples of department-organized programs.³⁵ Examples of centers that coordinate instruction and provide supplementary coursework for students majoring in more conventional disciplinary programs include the University of Wisconsin's Certificate program in Lesbian, Gay, Bisexual and Transgender Studies and Princeton's Center for African American Studies.³⁶

In the 1970s and 1980s, there was considerable debate about the merits of establishing departments with faculty appointment authority for these programs. There was also debate concerning the merits of subsuming various identity categories in single ethnic studies departments or programs like done, in Berkeley's Department of Ethnic Studies, or devoting departments or programs to a single identity like in Arizona State University's Department of Transborder Chicana/o and Latina/o Studies.³⁷

It appears that the jury is still out on the question of departmental status, since some of the newest programs are centers and institutes, while some are departments. There are some indications of growth in departmental status.

For example, Duke University's African and African-American Studies program was recently granted departmental status with an undergraduate and graduate certificate program,³⁸ indicating the continuation and growth in this category of heritage and identity. Although there are a growing number of initiatives in disability studies (for example, the University of Michigan's Initiative on Disability Studies³⁹), probably the best-known program is the Department of Disability and Human Development at the University of Illinois at Chicago, which offers a Ph.D. The Ph.D. faculty is drawn from across the university, and the program description provides a particularly clear case for the interdisciplinary project, arguing that "a particular strength of the UIC Disability Studies program is access to diverse faculty mentors and resources in the health fields, the social sciences, and the humanities. Students in the program conduct research across impairment, clinical, social, cultural, ethical, and policy perspectives. The program recognizes the inherent tensions that exist between therapeutic, medical, and social models of disability, but acknowledges these differences as fertile ground for the development of Disability Studies as an integrative knowledge base."⁴⁰

Methodology

By contrast, interdisciplinary initiatives focused on methodological development do not typically concentrate on undergraduate education so much as on high-level collaborations among senior faculty and researchers. Apart from instances like departments of Statistics or Computer Science, these initiatives are almost never given departmental status. Work on game theory, computing, and GIS seems to be increasing, driving innovation in both the natural sciences and the social sciences. Harvard's Institute for Quantitative Social Science provides a prominent example

of interdisciplinary methods research, in part because of its association with King, Keohane, and Verba's—all one-time associates of the Institute—and their influential book (1994). The Institute describes its mission as two-fold, scientific and organizational:

Interdisciplinary initiatives focused on methodological development do not typically concentrate on undergraduate education so much as on high-level collaborations among senior faculty and researchers.

Our scientific mission is: (1) to create, and make widely accessible, statistical and analytical tools for the social and health sciences; and (2) to use these tools for understanding and solving major problems that affect society and the well-being of human populations. The organizational mission is: (1) to foster interdisciplinary, often large-scale, and highly collaborative projects that cannot readily be accomplished within the traditional setting of individual departments; and (2) to build a scientific culture where faculty, students, and staff work side by side, not only to solve their own disciplinary problems, but also to seek out problems in unrelated or applied areas amenable to the same approach.⁴¹

The Institute co-sponsors the Ph.D. Program in Political Economy and Government offered by the Kennedy School, and provides opportunities for both undergraduates and graduate students with strong quantitative skills to work on research projects; however, the principal purposes of the Institute are not educational so much as research driven—the development and application of new analytical methods.

Like the Harvard Institute, the Center for the Study of Complex Systems (CSCS) at the University of Michigan developed from the cross-disciplinary collaborations of research faculty, in this instance, what the website describes as a “now-legendary group of researchers [who] began meeting over 20 years ago and [which] is made up of researchers from a variety of disciplines who share an interest in complex adaptive systems of all kinds.”⁴² There are no formal educational programs associated with CSCS, only a graduate certificate program, and most of the faculty are described as devoting their time at the Center to participation in grant proposals, research groups, and administration. By contrast, Columbia's Institute for Social and Economic Research and Policy (ISERP) was established by the then-provost to consolidate several small and relatively inactive social science research units, with the hope of raising indirect cost recovery rates on grants. ISERP has not produced a distinctive interdisciplinary research profile, although interesting work has been accomplished under ISERP's aegis⁴³ and it does oversee an M.A. program in Quantitative Methods in the Social Sciences. Conversely, Duke's Program for Advanced Research in the Social Sciences was launched with a graduate teaching mission (certificate and graduate fellowship programs) and is currently developing an undergraduate certificate and a freshman seminar program.⁴⁴

PART III. Interdisciplinary Practice in Today's Academy

To this point, we have focused on the scholar and the external funding agency, examining especially the interaction between scholarly and agency motivations and how that blends with agency-generated means for conducting the research. Of course, the college and university are both a source of motivation and means for interdisciplinary projects. With some exceptions (notably from the NEH, at least for political science, and some specialized, graduate-oriented programs at NSF), the college and university provide the great majority of administrative and resource support for interdisciplinary teaching and comprise a third source of funding in addition to the private foundation and government agency. As the last section illustrated, however, college and university administrations play a critical role in addition to the essentials of means and motives. For any project that requires any organization or institutionalization, the administration is the central player in designing such implementation of interdisciplinary projects and is therefore uniquely important. It is important to note that the differentiation between faculty and administration is often virtually non-existent. University involvement is the product of the amalgam of faculty and administration, and often puts heavy emphasis on external funding.

We begin by examining teaching. Interdisciplinary teaching and learning are sufficiently distinctive as to warrant special consideration of each subject by itself. One consideration is that teaching may take on special significance within the liberal arts college for achieving its mission, regardless of the motives of the individual scholar and of those external forces, such as foundations and the federal government, that often provide the means. That is to say, the motivation may be generated from within the college or university—perhaps “top down” from the administration, as well as “bottom up” from faculty or students. A second consideration is that interdisciplinary-based teaching and learning are two distinct subjects because their practice and impact are experienced differently by the faculty member and the student. There are also important differences depending on student level—the undergraduate student (and perhaps the professional graduate student, seeking a law or business or public policy degree) and the Ph.D. student differ markedly in their goals and, therefore, in the appropriate forms of instruction, interdisciplinary or not. Finally, we treat this topic somewhat differently, providing a more fully articulated set of illustrations and examples, because the limited literature on interdisciplinarity focuses disproportionately on research.

Teaching and Learning

While we start from a perspective that teaching and research have different expectations, demands, and structures, we also must note that interdisciplinary teaching is often aligned with interdisciplinary research and flourishes from the same roots: initial focus on a question of interest to scholars (both faculty and, in this case,

often students, too) that requires tools and perspectives beyond a more-or-less clearly defined set of disciplinary boundaries. In the contemporary academy, interdisciplinary teaching is flourishing, as evidenced by the numbers of interdisciplinary graduate and undergraduate programs that have long been established, by the range of connections between political science and other disciplines (typically, but not confined to, the other social and behavioral sciences), and by the continuing initiatives of new interdisciplinary programs, courses, and opportunities at the undergraduate and graduate levels.

Interdisciplinary teaching succeeds best under three essential conditions: strong administrative support; a clear and well-constructed curriculum; and dedicated faculty who are supported with positive incentives. We proceed by considering these conditions and illustrating best practices we have encountered.

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Interdisciplinary teaching is generally conducted in two major ways in interdisciplinary programs:

- Required teaching of disciplinary courses in interdisciplinary programs (for example, Research Methods in International Studies; the U.S. Political System in Urban Studies; Women and Politics in Women’s Studies);
- Teaching interdisciplinary courses (for example, the U.S. and Global Citizenship; the Middle East: Economics, Politics and American Policy; State and Society in Latin America).

These are near analogues to the distinction between “*multidisciplinary*” and “*interdisciplinary*” practice. In multidisciplinary teaching, primary emphasis is on coordinating courses from two or more departments, courses that may already exist within established departments and disciplines, or on creating new but otherwise “standard,” “conventional,” or “mainstream” disciplinary courses. In interdisciplinary teaching, courses involving explicitly interdisciplinary coursework and/or courses in more than one discipline must be developed, coordinated, and supported.

Interdisciplinary teaching, like interdisciplinary research, emerges in two ideal modes: as an initiative from entrepreneurial faculty members (perhaps in response to interactions with students) who identify mutual interests, devise a course proposal, and seek support from within or from outside the college or university; or as an administrative initiative to encourage and support the development of interdisciplinarity at the college or university level.

Interdisciplinary teaching is conducted in three major ways. The course is developed and taught by a single instructor, bringing together methods, perspectives, evidence, and texts from several disciplines to bear on a question or course topic; we

believe this to be the most common approach, based on anecdotal but not systematic evidence. It is virtually impossible to say how common this type of course is, if for no other reason than that many “mainstream,” discipline-centered courses have sections or topics drawn from work in other disciplines. Voting behavior is at least a serious contender for being the “most centrally ‘political science’ course.” It is common to require readings from psychology, communications, economics, sociology, and other disciplines in such courses. Thus, an interdisciplinary course may well live comfortably in interdisciplinary programs, as cross-listed in two or more disciplines, or it may be wholly contained within a single department.

The second common venue for interdisciplinary teaching is a course taught by several instructors, from different disciplines and departments, who teach as a team, usually *in seriatim*. Such courses are often among the most exciting for students, who get to observe and (we hope!) learn from several faculty members dealing with their particular strengths. These courses can function as samplers to provide students with several disciplinary perspectives on a topic or problem, but at their best, (which can be very good) they are multidisciplinary rather than truly interdisciplinary.⁴⁵ For such a course to become genuinely interdisciplinary, it requires a course coordinator (or other means of coordination) who seeks to integrate the multiple perspectives into an interdisciplinary whole, which demands considerably more than assembling leading lights from the faculty to provide their individual brands of interesting materials.

The optimal venue for a genuinely interdisciplinary course is one taught in tandem by two instructors (conceivably more, but two is typical) who are usually from different disciplines and departments. As with other seriously team-taught courses, the workload for each of the two faculty is not the equivalent of a half-course, but at least typically closer to 3/4ths of a course, with additional effort required to integrate text and topics from the different disciplines into a coherent (that is, genuinely interdisciplinary) whole. Like interdisciplinary research, interdisciplinary teaching requires extensive effort to learn the differing disciplinary “languages.” Often, the course is valued administratively as a half-course, so that the instructors assume the additional true cost (say, an extra one-quarter course effort equivalent) on their own.

Interdisciplinary teaching and learning require encouragement and support for faculty. They are most likely to succeed when an institution creates a context within which interdisciplinary work is recognized, valued, and rewarded. A supportive context extends to individual and independent initiatives, program construction, research projects, and course and curriculum construction. Graduate programs will have unique requirements that recognize graduate student coursework inside, outside, and across political science and other disciplines, and recognize the need to prepare graduate students for interdisciplinary teaching, topics we address separately. Undergraduates often are required by college core curricula to engage in coursework across many disciplines. In some colleges and universities, special non-disciplinary courses (which may be interdisciplinary) are designed for first-year, or first- and second-year students.

Later in their career, undergraduates may benefit from interdisciplinary programs that recognize disciplinary boundaries, even as those boundaries are transgressed or redrawn. It is increasingly common to have specially designed interdisciplinary programs that lead to the awarding of certificates (for certificate programs that provide additional course work), or even provide minors or majors.

Two examples of best practices help to make these considerations clear: Duke University's FOCUS programs, and the Markets and Management program in Duke's business school.

*FOCUS Programs for first-year students.*⁴⁶ FOCUS programs for first-year students originated with a single example at Duke in the late 1970s. There are as many as 30 such programs in any given year, thus affecting a substantial fraction of first-year students. A FOCUS program is a complete one-semester, first-year program. Until recently, all have been offered in the student's first semester; now, some also are held in the second semester of their first year. Students apply for admission before arrival on campus to a necessarily multidisciplinary program, with topics proposed by faculty. Each program admits up to 35 students. Students select three substantive seminars from the larger number offered, each by a faculty member, each in a different department. All students take the same first-year writing course and an interdisciplinary seminar held once a week. The seminar is usually combined with dinner and discussion, with all faculty invited, to consider a different topic each week. The students live in the same dorm area, and the university provides money for supplementary events, including field trips. These are intensive semesters, often described by the students as the best of their career at Duke. Faculty also report that their seminar and FOCUS activities are unusually rewarding. Faculty also use them to recruit majors and teaching assistants from among the strongest students, who have already expressed interest in the subject. FOCUS programs are expensive, in that they fill a considerable number of undergraduate contact courses from among the best faculty at the university. However, they are also effective in recruiting students to come to Duke in the first place. The FOCUS program originated as a faculty initiative in a single program. FOCUS is now championed by the administration. We suspect that this reflects a common mixture of faculty—administrative initiatives that start “bottom up” and are then facilitated “top down.”

Markets and Management program. Like many business schools, Duke's Fuqua School of Business does not teach undergraduates. There is, however, considerable undergraduate demand for business-oriented courses. In nearly pure “top-down” fashion, Duke solicited proposals for an undergraduate certificate program, eventually called “Markets and Management,” to meet this demand.⁴⁷ The program developed in, and continues to be administered by, the sociology department. As with all certificate programs, courses are offered from several different departments, making it, at least, a multidisciplinary program; there is a required capstone course that has its own (i.e., non-departmental) designation, creating at least one course that is genuinely interdisciplinary. Students are required to take seven courses from at least three

departments. Again, this particularly successful certificate program has thrived on a combination of support (both in creating the program and in providing continuing support for staffing) from administration and from already motivated faculty to meet a high regular demand from undergraduates.

In all of these venues, interdisciplinary teaching requires focused communication between administrators and faculty; identification of optimal structural arrangements for supporting interdisciplinary teaching; additional faculty development resources; clear means of evaluating faculty successes; and structured and flexible means of assessing the results and progress of interdisciplinary teaching, including an evaluative timeframe to confirm programs or courses as permanent additions. Three general conditions appear to provide the best faculty context for interdisciplinary teaching: institutional support; proximity of faculty teaching interdisciplinary courses to each other; and absence of institutional impediments.⁴⁸ The conditions for best practices in interdisciplinary teaching include:

- Reliance on individual faculty initiative;
- Capacity of faculty to be in contact and in discussion with faculty outside the home department;
- Curricular space within the department to permit new course development and support within the department to do so.

Graduate Students

Because many new Ph.D.s will be employed in institutions with an interdisciplinary focus, encouraging and preparing graduate students for interdisciplinary teaching will position them for an easier transition to full-time college or university teaching. In small institutions, new graduates may find themselves responsible for teaching or participating in first-year interdisciplinary writing seminars; for teaching methods courses to students from a broad array of social science departments; and for teaching introductory interdisciplinary courses in programs such as Environmental, Urban, or Middle Eastern Studies.

Graduate students require at least two foci in regard to interdisciplinary teaching: 1) their own substantive and methodological learning in graduate courses, with support for taking cross-discipline and out-of-discipline courses; and 2) preparation for interdisciplinary teaching, in the context of disciplinary doctoral training, including team teaching and teaching collaboration.

Undergraduate Students

Undergraduates may be better prepared for interdisciplinary coursework than are their professors or graduate students. High school preparation for college typically does not involve discipline-specific training in the social and behavioral sciences. Few students

have access to political science courses, even in the best high schools; AP courses focus more on subject matter than discipline per se. The absence of socialization to a discipline may make interdisciplinary coursework more accessible to undergraduate students. In addition, undergraduates are conventionally required by college core curricula to engage in coursework across many disciplines. This multidisciplinary requirement makes interdisciplinary programs and coursework even more accessible to them. Moreover, many colleges and universities require undergraduates to complete first-year seminars as their introduction to higher education; these are usually focused on writing and are interdisciplinary in focus and scope. To the extent that these general programs are tied to academic advising, undergraduates receive a strong and early message that interdisciplinary work is expected and valued. Finally, undergraduates increasingly are opting to double- or even triple-major in their degree programs. For these reasons, opportunities for interdisciplinary teaching may be richest at the undergraduate level, with positive implications for faculty and for graduate student training.

Interdisciplinary Methods Training in the Social and Behavioral Sciences

Research methods are, arguably, one of the subjects most amenable to interdisciplinary instruction. Research design, probability and statistics, experimental design and experimentation itself, computational and agent-based approaches, historical methods, elite interviewing techniques, and case study methodology are the unique province of no single discipline. Each discipline faces its own unique combination of circumstances that often pose special, and thus disciplinary-specialized, problems—for the study of governments, or markets, or tribal lineages in multiple borderless nations. However, the basic principles of research design, methods, and analysis need to be mastered in very similar forms in each discipline before the advanced problems can be addressed.

Research methods are, arguably, one of the subjects most amenable to interdisciplinary instruction.

As part of the 2007 Undergraduate and Graduate Methodology Committee reporting to the APSA organized section on Political Methodology, Glasgow (2008) presented a series of findings about three relatively common interdisciplinary approaches to graduate methods training in political science. One is creation of explicitly interdisciplinary units (departments or programs) that offer degrees, such as the Quantitative Methods in the Social Sciences Program at Columbia University that offers an M.A., and programs at California Institute of Technology and the University of California, Irvine that offer a Ph.D. These Ph.D. programs typically are more oriented toward modeling and rational choice than they are grounded on developing rigorous statistical or other empirical estimation-based techniques, although all offer training in both. Conversely, the second category Glasgow mentions offer programs oriented more toward quantitative methods. In this second approach, selected graduate students are offered fellowships to participate in interdisciplinary programs. For examples, Glasgow points to the Mellon-sponsored program at Columbia and the Quantitative Social Science Initiative at Penn State.⁴⁹ As he noted, these programs are distinct from

disciplinary departments, and a fairly complex set of administrative procedures and resources is required to create and sustain them.

Another common strategy to expose Ph.D. students to interdisciplinary methods is to send them to summer institutes, such as the ICPSR summer institute. There has been a proliferation of such summer programs (Political Psychology now at Stanford, Field Experiments at Yale, EITM at various universities, the Santa Fe Institute, etc.). ICPSR has served this role for nearly two generations and continues to add courses and locations. Specific courses are now offered outside Ann Arbor, at locations such as the University of North Carolina-Chapel Hill. This approach has several advantages. These programs can easily be tailored to interests and, while costs vary, they are relatively inexpensive—certainly in comparison to setting up new units on one’s own campus. One of the disadvantages is that the department and university lose control over the content and the nature and quality of instruction.

The most common use of at-home interdisciplinary programs for methods training in the social sciences is the graduate certificate program. Certificate students take course work in addition to (and often “beyond,” that is, more advanced course work than) their methods training within their department. These courses (typically four to seven additional ones) may simply be selected from a list of others offered by other social science departments, or a statistics department, although there is ordinarily a requirement that these additional courses cohere in some fashion defined by the certificate program. Thus, a psychologist may learn the methods associated with social networks through courses offered in a sociology department that would not otherwise be available in the home department. Some have courses that are intended to be genuinely interdisciplinary, such as gateway or capstone courses. These certificate programs are divided between statistical (or more generally quantitative) methods and certificate programs in survey research.

Administration of Interdisciplinary Programs

University structures and budgets still place primary emphasis on academic disciplines and professional schools. Incentives for young scholars remain heavily disciplinary—teaching discipline-based courses in the department and publishing in the top-ranked journals of the discipline, en route to promotion and tenure and, later, to merit raises and other resources based on department-centered evaluations. Disciplinary departments define who is a “peer” for tenure evaluation, which in turn affects how productivity is measured; this is partly due to tradition, and partly due to concerns that interdisciplinary units may lack sufficiently clear standards of excellence to support evaluation.

These common structures and incentives should not be changed lightly. Compelling reasons do exist, nonetheless, for a greater focus on interdisciplinary endeavors. These include the growing complexity of society, the tendency of problems and their solutions to cross disciplines, and the applicability of new technologies

(NAS 2005). Administrators, from department chairs through university presidents, face complicated trade-offs between disciplinary structures that frequently work very well, and the growing sense that the future belongs more to interdisciplinary work and emerging disciplines. This interdisciplinary emphasis has taken deepest root in the hard sciences, but it is steadily reinforced by the rise of emerging disciplines. Note that the tradeoffs often hit most directly on the departments and their chairs, while it is often the higher-level administrators whose units benefit most from a judicious mixture of the disciplinary and the multidisciplinary.

Administering the teaching of interdisciplinary (or multidisciplinary) courses is relatively easy for department chairs and deans because faculty can easily craft courses by drawing upon and extending their disciplinary expertise. For example, the team-taught undergraduate course, “The Art of Detection,” at the University of Maine used detection as an overarching theme: a historian taught the proper techniques to uncover and sift archival records; an English professor taught the genre of detective novels and films; a political scientist taught information flow between the legislative and executive branches, with focus on the doctrine of executive privilege versus the legislature’s right-to-know (Moen 1995). The workload problems were easily addressed. Innovative scheduling, which included classes on several weekends in the semester, allowed students to take one, any two, or all three of the courses. The three relevant academic departments and the dean agreed that faculty participation in the Art of Detection constituted a full course for the purposes of workload, so administration was straightforward. Of course, the trade-off was that the individual faculty member taught an “unusual” course, while a more or more “usual” courses (which might have been more central to the department’s mission) was not being taught. A common case is that two or more faculty teach one course, in which case the expense is either borne by the faculty (as noted above, if given credit for a half-course for teaching purposes, that under weights the actual effort-contribution) or the department (if two faculty get a full one-credit course each) or perhaps the college or university (if the higher administration compensates the department for lost course load).

These types of courses seem to benefit all parties. Students learn disciplinary knowledge, but they are also pushed to synthesize thematic material. Faculty are able to convey disciplinary material while they learn content and pedagogy from the other faculty on the teaching team. Some diletantism can be indulged because the planning and execution of such a course is, in itself, a quintessential faculty development experience. Finally, administrators benefit from the enriched and lively curriculum within the school, college, or university.

Research: Challenges for Interdisciplinary Practice and Administration

Interdisciplinary research is much more difficult to administer properly. At the level of the individual faculty member, it can be difficult even to convince people that interdisciplinary research is a valuable enterprise. Faculty have consciously chosen one

academic discipline from among the many that exist, and then received their training in that discipline. It is not surprising that most believe in its intrinsic worth and subscribe to its shared values and norms. The natural inclination of faculty is to advance understanding and add to the existing literature in their own particular academic discipline. Blind review processes conducted by similarly interested and trained scholars reinforce the tendency toward disciplinary specialization, despite the charge that “intellectual and methodological narrowness” may harm the profession (APSA 2004).

Peer-review processes reinforce the critical role of the disciplines. Whether by collective bargaining or university practice, most institutions leave the definition of “peer” to the disciplinary departments to determine. This exercises an important measure of quality control for essential processes, such as tenure evaluation; however, department control tends to undervalue trans-disciplines and emerging disciplines. Incentives often push faculty toward greater specialization. Salary policies are tied to faculty research productivity at the great majority of colleges and universities. The higher rates of productivity commonly associated with finding a research niche can translate into higher individual salaries.

The need of younger scholars to build a network of more established scholars who are willing to write favorable promotion and tenure letters also encourages specialization more than experimentation and broader risk-taking. The desire of all scholars for recognition and reputation, which gives them a measure of external protection from campus politics or decisions, also encourages research niches.

A candidate for tenure with strong interdisciplinary (or even multidisciplinary) scholarship poses serious issues for fair evaluation for tenure. Suppose, for example, a political scientist builds on some theory or method drawn from economics. In soliciting a letter for review for the tenure process, it might well be pernicious to ask an economist the standard questions about the candidate’s standing in the field, and about the quality of the economics work. A far more appropriate question is whether the candidate is using the contribution s/he took from economics appropriately. Yet, at many universities, the department is *required* to send exactly the same letter to all reviewers.

Even tenured faculty face some incentives toward specialization that can provide a similar incentive toward specialization. The freedom to pursue new subjects is ordinarily cited as one of the major benefits of tenure, and is also thought to be a major impetus toward interdisciplinary work. While that is certainly correct, so too may freedom to pursue wherever their mind (and heart?) leads them yield narrower research agendas. It can allow scholars to drill down to items of more personal than programmatic interest. As a result, the one-time scholar of social contract theory becomes interested in only a particular political thinker or work, and the legislative politics scholar becomes engaged only in the scholarship of committee assignments or filibusters. In the worst cases, individual faculty may deliberately pursue specialization in the quest for personal profit. Thus, a tenured professor of Asian politics deliberately

narrowly focuses on China, where lucrative consulting opportunities abound; rather than publishing in journals to advance the state of knowledge, the faculty member writes commissioned reports for businesses, think tanks, and government agencies. As the faculty member maximizes personal profit in such activities, the department loses some programmatic breadth and academic reputation. Of course, there are two sides to each coin, and it may well be true instead that consulting ends up offering considerable benefit not only to the individual faculty member, but also to the department and discipline, if it makes teaching more relevant and/or suggests new issues that mainstream work in the discipline does not engage.

Research specialization often begets more of the same because of the tendency for faculty to clone themselves. Particularly at research universities, where the focus is so concentrated on the rate of acceptable publication, the incentive for the individual faculty member is to hire colleagues with shared research interests who might serve as co-investigators, or at least provide informed commentary on draft manuscripts. Intense scuffles can ensue over the specific language in job advertisements, as individual faculty push to hire new people with content and methodological affinities. This works against the hiring of an interdisciplinary faculty and the practice of interdisciplinary research.

Finally, departments may question interdisciplinary work because their faculty realize—more fully than administrators do—just how elastic their disciplinary boundaries can be. Political science is a case in point, with its historic roots in political philosophy, constitutional law, and public administration, and its incorporation of survey research and rational choice. Biology has moved beyond categorization of flora and fauna to accommodate neuroscience, ecology, and mathematical estimation. Part of the resistance of departments to interdisciplinary structures is that augmented disciplinary structures may serve the same purpose, without all of the fuss. The issues faced by the United

Finally, departments may question interdisciplinary work because their faculty realize—more fully than administrators do—just how elastic their disciplinary boundaries can be.

States with parts of the Arab world, for instance, might be tackled by a whole new set of centers, think tanks, and institutes on college campuses, but they might also be addressed by strengthening Middle Eastern politics programs in political science departments, by offering more Arabic in language departments, and by increasing diversity in journalism schools. The answer to whether that is true or not depends vitally on what problems actually need to be addressed that fall within the general phrase “issues faced by the United States with parts of the Arab world.” Equally vital is a sense of defining questions important for (at least near-term) future developments. “Do elastic boundaries within disciplines sufficiently address needs or are new structures required?” is thus a complex question admitting of no easy answer.

Deans and provosts also have legitimate concerns about interdisciplinary approaches. One of their challenges is deciding when interdisciplinary institutes and centers are actually warranted. Most college campuses have institutes and

centers named after prominent alumni, donors, or political figures. Sometimes they are sufficiently numerous as to cause some balkanization of the university. When these institutes are created above them, the deans and provosts often are charged with supervising operations that they might not have chosen to create or supported financially. They become skeptical of adding additional institutes and centers.

As discussed earlier in comments on the elasticity of disciplinary boundaries, it is difficult for deans and provosts to know when new interdisciplinary structures would truly serve the research mission. Simple infusion of resources into existing structures might serve the same objectives more easily. A study funded by the NSF discovered that universities tend to repackage and rename existing structures, rather than creating truly innovative interdisciplinary structures (Rhoten and Parker 2004).

Another concern of deans and provosts is that interdisciplinary initiatives and structures will become obsolete. Strategic institutes focused on winning the Cold War lost much of their purpose after the Berlin Wall fell, for instance, and research institutes built around supercomputing applications lost their panache when powerful desktop computing grew ubiquitous. There are solutions to the obsolescence problem, like Iowa State's Summer Program for Interdisciplinary Research and Education/Emerging Interface Technologies.⁵⁰ It accepts computers as ubiquitous and concentrates on the interdisciplinary components of human/computer interaction. But ever mindful of the fact that problems constantly evolve, deans and provosts are understandably cautious about creating new structures.

The most obvious way to avoid obsolescence is to include sunset provisions at the origination of new interdisciplinary units. At the University of North Texas, a policy was established by the board of regents that charged the provost to engage in sunset reviews at least every five years. A complicated nine-step process then ensues, starting with consultation, proceeding with a formal report of the history, activities, and finances of the research center, and continuing with formal recommendations from academic administrators and the faculty senate, all prior to final action by the president.⁵¹ A somewhat more lenient process is permitted at the University of California, San Diego. There an interdisciplinary research unit is scheduled for a sunset review every 15 years, although intervening five-year reviews are required. Here too, the research unit must justify its existence, by explaining its objectives, accomplishments, impact on the curriculum and broader university, and its future research and anticipated funding plans.⁵² It is, of course, conceivable that such sunset plans conflict with fund raising, particularly from private donors. Yet careful attention to ensuring the continuation of work in a broad field of study can be negotiated in advance with donors to alleviate concerns about sun-setting a specific interdisciplinary unit.

Deans and provosts must also worry about standards. Here is the peer-review problem most clearly. National disciplinary rankings can mean a great deal at research institutions, and redirecting faculty time and talent to more interdisciplinary

endeavors can jeopardize those rankings. In another variation on this theme, individual faculty may try to evade difficult disciplinary standards for publication by looking to interdisciplinary outlets. Because publishing is an imperative—and because publishing is no easy matter in the top disciplinary journals and leading academic presses—it is natural that some faculty would be drawn to venues with higher manuscript acceptance rates. Consider the new assistant professor of political science who must amass a research record suitable for tenure. At all but elite research institutions, there is strong incentive for this faculty member to submit to a well-regarded journal like *Social Science Quarterly*, with its ranking of 26 out of 59 interdisciplinary journals, rather than to the *American Political Science Review*, with its top ranking out of 79 political science journals. The same basic professional calculation applies to the tenured faculty member whose scholarship has languished and whose salary has therefore stagnated. Deans and provosts are sometimes wary of interdisciplinary research, given that disciplines are traditionally the custodians of high research standards.

This requires particular care in the most important merit evaluations of the university, particularly those associated with promotion and tenure. Here administrators probably play their most central role. They can decide whether to support or reject an individual faculty member's application, based on his/her record of disciplinary or interdisciplinary work. They can decide how heavily to weigh interdisciplinary teaching and publication, as well as external letters from disciplinary or interdisciplinary reviewers of the tenure dossier. Administrators can also decide how to credit collaborative interdisciplinary classroom work and co-authored publications, which are clearly on the rise (Chandra et al. 2006). Well in advance of a tenure and promotion decision, administrators may be able to extend the tenure clock for an individual faculty member through university policies that provide time for life changes, or through release time during the probationary period. This is not to say that administrators can decide willy-nilly the timing of tenure and promotion applications; they are bound to some greater or lesser extent by contract law, past practice, interpretations by Human Resources, and/or recommendations by prior levels of review. But at places like the University of Michigan, deans and provosts are able to waive a particular year in a maximum eight-year tenure clock, or to discount a year where a faculty member holds a less than full-time appointment.⁵³

Fostering Interdisciplinary Research

So how do administrators overcome systematic problems with interdisciplinary research? There is no single answer, and no easy answers, but a useful starting point is the counter-intuitive strategy of building strong academic departments. Although a causal connection is not easily demonstrated, a correlation certainly exists between the existence of high-quality departments at a university and innovative interdisciplinary research. By examining the record of faculty publication in a total of 63 political science journals over a five-year span, Hix (2004) assembled a list of the top 200 political science departments in the world. Topping his list was Columbia University which, in that

same year, was home to 277 different interdisciplinary units—some judged to be more influential than academic departments (NAS 2005, 20). Second on the list was Harvard,

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likewise home to a wide variety of interdisciplinary programs, including the Institute for Quantitative Social Science with its nearly 70 cooperating faculty and its ambitious interdisciplinary research programs aimed at solving social problems.⁵⁴

Beyond building a foundation of quality disciplinary units from which to draw quality scholars, administrators must also provide public support for interdisciplinary research. The value of interdisciplinary research and teaching is comparatively easy to advocate in the campus and external venues where top university officials usually promote their missions. But public support must also translate into tangible actions. An obvious but important way for administrators to show support is to feature interdisciplinary practice in their university's strategic plans. At the University of Utah, the top priority mentioned in the strategic plan in advance of a 2006 accreditation visit was to "support the growth of prioritized interdisciplinary teaching and research

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programs, as defined by faculty and student interests, through targeted funding and special incentives."⁵⁵

This translated into specific strategic goals, such as cluster hiring of faculty, inclusion of the successful interdisciplinary units in the next capital campaign,

planned research across departmental boundaries, and building new centers and institutes in areas of promise. Regarding the last point, the University of Utah launched its Brain Institute in 2005, aimed at imaging and treating disease. Two prominent medical doctors and two prominent research scientists were hired in the same year to drive the research program, and they are now accompanied by dozens of affiliated faculty across eight of the University's colleges and schools.

The University of Utah clearly aligned college and school plans with its strategic plan. For example, its College of Social and Behavioral Sciences mentioned "interdisciplinary teaching, research, and service" as its top objective, and it purposefully created a new Institute of Public and International Affairs to augment its interdisciplinary activities.⁵⁶ Beyond individual colleges and schools, the university created an Office of Interdisciplinary Studies to serve as an impetus and clearinghouse for dozens of interdisciplinary research efforts spread across the campus.⁵⁷ It provides a range of internal grant opportunities and seed money for faculty in addition to external grant support. The Office works to link potential collaborators through a search engine that outlines the research interests of faculty.

Since incentives for individual faculty also play a key role in fostering the existence of interdisciplinarity on campus, administrators must be certain that interdisciplinary teaching and research are rewarded by the institution. One approach used by the University of South Dakota to accentuate the importance of interdisciplinary teaching

is to designate its Interdisciplinary Education and Action program (IdEA) as a “signature program.” This designation permits faculty teaching in the program to claim full workload credit for any course taught in IdEA. It also improves the chances of faculty for salary enhancement. Each year 15% of the salary pool is placed in a category known as “institutional priorities,” and one of the designated institutional priorities is teaching in signature programs. Interdisciplinary research is rewarded analogously. External grant funding is explicitly recognized as an institutional priority that qualifies for salary enhancement, providing incentive for faculty to collaborate across disciplines and with other partner schools to win multi-year grants.

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Faculty proximity is another critical element for successful interdisciplinary research, and again, administrators can learn from successful operations at other institutions. At Harvard, the Institute for Quantitative Social Science is entirely housed in one building, which also contains related research centers and the department of government. One interesting feature is a whiteboard mounted in the hallway that allows students and faculty to publicly post their innovative and collaborative ideas. This facilitates cooperation in areas such as political economy, survey research, and demography. At Yale, the Institution for Social and Policy Studies houses some 50 resident and post-doctoral fellows, affiliated faculty, and visiting professors. It encourages exploration of a range of social issues, evident in seminars and publications on subjects as diverse as ethics, hate crimes, agrarian studies, and risk assessment. It has solid connections to undergraduate, interdisciplinary, and post-doctoral programs.⁵⁸

Part IV. Conclusions: The Place of the Individual in a Disciplinary-Based Academy Emphasizing Interdisciplinarity

One sort of summary is to imagine the circumstances in which the graduate student, junior faculty member, senior faculty member, and college or university administrator find themselves in an academy built on disciplines in a world in which there is considerable (and justifiable) pressures for interdisciplinary research and teaching. Here we point first to some of the key problems, constraints, and trade-offs that one in each of those categories is most likely to face. We then turn to the means, methods, and motives structure to reconsider the positive side: conditions that facilitate successful interdisciplinary scholarship.

Graduate students are most likely to recognize the constraints of the mainstream definition of their discipline, its boundaries, problems, methods, and paradigms. They are, indeed, the most likely to be able to pick up on new approaches and directions—through replacement, they are the ones staging Bohr’s scientific revolution, one funeral

at a time. Conversely, they are also in one of the most vulnerable positions. They need to secure the backing, support, and training to succeed in the job market and then as a junior faculty member. If it is the case that the academy is built on the strengths of its disciplines, graduate students may well be attracted to the academy in the first place by the strength of disciplinary scholars. They will need to be able to convince disciplinary leaders in order for their work to be received, both in the job market and by the journal and university press editorial board. The ultimate in disciplinary coinage is successful peer review, the assent of their relevant scientific community. The trick, therefore, seems to be to seek ways in which to loosen the tight constraints most students in Ph.D. programs find themselves held to. One example is the use of certificate programs for interdisciplinary training. These are advantaged by virtue of the fact that some, perhaps even all, of the coursework can be done post-preliminary examinations, allowing the student to achieve their disciplinary training and then focus on a less time-pressured study of interdisciplinary topics.

The situation is very similar, if slightly less constrained, for junior faculty members. The constraints are a bit less tight because they are likely to have completed their first project, their thesis, which presumably demonstrates their ability to earn the assent of the relevant scientific community. Here, “relevant” has an easy definition: those who may be asked to evaluate the faculty for promotion and tenure. Still, doing interdisciplinary research that is well away from the typical disciplinary research paradigm is risky. It is for these purposes that universities leading the quest to handle interdisciplinary questions typically refuse to hire junior faculty into interdisciplinary units and to develop collegiate- or university-level procedures for supplementing the disciplinary review of work for promotion and tenure. Nonetheless, not only may junior faculty members see more reward in interdisciplinary scholarship than do more established scholars (having helped define what that relevant scientific community is), but they also suffer considerably greater risk in moving well beyond the boundaries of their discipline. Hence, it is not surprising to find that newly tenured scholars are often among the leaders in promoting and developing interdisciplinary programs. Of course, senior faculty do also face some considerable degree of risk and reward.

Merit still matters, not just in the allocation of goods, but also in creating the recognition that comes with producing high-quality scholarship. If such scholarship is not able to achieve any recognition, that is, if merit does not receive, in a general sense, the assent of some relevant scientific community, then the value and impact of the scholarship is thereby reduced. The problem for interdisciplinary work, of course, is how merit is to be assessed; that is, who will be given the trust of those not in the area to assess merit when work is not purely disciplinary? Further, time spent in interdisciplinary activities is time away from disciplinary activities, and that often means away from the department, as well. This may prove to be the most important concern of the first-line of collegiate and university administration, the department chair.

With interdisciplinary work of any significant magnitude often needing to be housed in some administrative unit, a program, center, or what have you, the trade-off between the department and non-departmental unit becomes clear. When one's strongest scholars are spending time in research or teaching in locations outside the department (and we say "department" intentionally, because this would be true in any way of defining the structure of a university), that comes at the expense of effort and product developed within the department. The chair needs to ensure that the undergraduate majors are well served, the graduate program is staffed to ensure placement of its graduates in the best possible positions, and that the burdens of satisfying those needs (and of course the departmental administration itself) do not fall disproportionately on any particular group of faculty. That is as true of ensuring that junior faculty are shielded from carrying heavier burdens as it is for ensuring that scholars whose work fits comfortably within the boundaries of a discipline carry no more than their share of admissions committees, university task forces, etc.

In many respects, this places some of the most important tasks in the hands of the college and university administrator. It is taken as a standard rule that the strongest interdisciplinary programs are found where the disciplines that are involved are the strongest. In part, this reflects strong faculty with active curiosities, and hence a high likelihood of having the motivation to ask interdisciplinary style questions. In part, it reflects the simple fact that the wealthier the university, the easier it is for it to support "luxury goods" such as these. In part, it represents the equally simple fact that universities at the top also have, and can continue to attract, the strongest and most innovative administrators.

Still, as the previous discussions have sought to demonstrate, the central trade-offs that affect interdisciplinary research, including the competition for scarce financial resources and for faculty time, are most effectively handled through university administration, while the ideas and inspirations that motivate interdisciplinary scholarship, in both teaching and research, come primarily from the faculty. Matching scholars with external funding is a partially endogenous problem of finding common interests, aided by alert university administrators. This may be partially solved by the provision of limited resources (often by seed grants and the like) to make more probable the matching of faculty interests to those of external funders. Then, it is more a question of whether the administration is able and willing to negotiate the potential trade-offs to make it possible for the serious clashes of competition over scarce resources within the university, and the competition between strength in disciplinary base and innovation in interdisciplinary scholarship, to be managed successfully. In this sense, the university administrator has the chance to be the hero of this story; the administrator's support can make the difference between an interdisciplinary initiative's success or failure.



References

- APSA Task Force on Graduate Education. 2004. "A Report on Graduate Education in Political Science." Washington, D.C.: American Political Science Association.
- Axelrod, Robert. 2008. "Political Science and Beyond: Presidential Address to the American Political Science Association." *Perspectives on Politics* 6 (March): 3–9.
- Biddle, Sheila. 2002. *Internationalization: Rhetoric or Reality?* Occasional Paper #56. New York: American Council of Learned Societies. Available at: www.acls.org/op56.pdf.
- Chandra, Kanchan, Jennifer Ghandi, Gary King, Arthur Lupia, and Edward Mansfield. 2006. *Report of the APSA Working Group on Collaboration*. Washington, D.C.: American Political Science Association.
- Coleman, James S. 1990. *Foundations of Social Theory*. Cambridge: Harvard University Press.
- Fleishman, Joel L. 2007. *The Foundation: A Great American Secret: How Private Wealth is Changing the World*. New York: Public Affairs.
- Glasgow, Garrett. 2008. "Interdisciplinary Methods Training in Political Science." *Political Methodologist* 15 (2): 8–11.
- Huber, John, and Charles R. Shipan. 2002. *Deliberate Discretion?* London: Cambridge University Press.
- Hix, Simon. 2004. "A Global Ranking of Political Science Departments." *Political Studies Review* 2 (3): 293–313.
- King, Gary, Robert O. Keohane, and Sidney Verba. 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton, NJ: Princeton University Press.
- Kuhn, Thomas. 1996 [1962]. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.
- Moen, Matthew C. "Team Teaching Over an Interactive Network," paper delivered at the Annual Meeting of the American Political Science Association, Chicago, September 1-4, 1995.
- National Academy of Sciences. 2005. *Facilitating Interdisciplinary Research by Committee on Facilitating Interdisciplinary Research and the Committee on Science, Engineering, and Public Policy*. Washington, D.C.: National Academies Press.
- O'Connor, Alice. 2007. *Social Science for What? Philanthropy and the Social Question in a World Turned Rightside Up*. New York: Russell Sage.
- Putnam, Robert D. 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press.
- Rhoten, Diana. 2004. "Interdisciplinary Research: Trend or Transition." *Items* 5 (1-2): 6–11. Available at: www.ssrc.org/publications/items/items_5.1-2/interdisciplinary_research.pdf.
- Rhoten, Diane, and Andrew Parker. 2004. "Risks and Rewards of an Interdisciplinary Research Path." *Science* 306 (5704): 2046.
- Sacks, Oliver. 2008. "Creativity and the Brain." Keynote Address, Autonomy, Singularity, and Creativity Conference, National Humanities Center, November 13.
- Wilson, Edward O. 1998a. *Consilience: The Unity of Knowledge*. New York: Knopf.
- . 1998b. "Back from Chaos." *Atlantic Monthly* 281 (3): 41–62.

Endnotes

- 1 As we will see later, "fundamental understanding" and "solve problems" have long seen as distinct motives for moving in an interdisciplinary direction.
- 2 We explore these questions in detail in the larger report. In addition, see Alice O'Connor, *Social Science for What? Philanthropy and the Social Question in a World Turned Rightside Up*, (New York: Russell Sage, 2007) for an account of early foundation activity, and Joel L. Fleishman, *The Foundation: A Great American Secret: How Private Wealth is Changing the World* (New York: Public Affairs, 2007).
- 3 By "national project" we mean a sequence of events following from the emergence of the U.S.

- national government as particularly powerful domestically. The interdisciplinary response to understanding these domestic public policy processes was projected internationally as a framework for understanding liberal democratic politics in general. This paradigm places the U.S. effectively in the world and where leadership became critical.
- 4 Fleishman (2007) offers a diversity of case studies which provides, if not a survey of their work, a sampling from a larger universe than we select. Some of these, of course, are aspects of the two projects we pursue here.
 - 5 www.ed.gov/about/offices/list/ope/iegps/title-six.html.
 - 6 A Fleishman (2007, 110) case study with the title, “Founding an Institute to Research Public Policy: Economic Policy Research of the Highest Quality,” gives a flavor of this ambition.
 - 7 Contrast Fleishman’s case studies on the Green Revolution, race, and population research, all dated no later than 1952, with Olin’s project that lead to conservative legal advocacy, dated 1975 (Fleishman 2007, Chapter 8).
 - 8 We would like to thank Drs. Cheryl Eavey and, especially, Brian Humes for their contributions to this section on the NSF. Their views are offered as their own and do not necessarily reflect the views of the NSF.
 - 9 The term “cross disciplinary” in this section represents both interdisciplinary and multidisciplinary approaches.
 - 10 In distinguishing between interdisciplinary and multidisciplinary, the former seeks to meld theories, data, and methods from more than one discipline together, while in the latter the disciplines work in parallel to examine a subject.
 - 11 NSF Political Science Program Web Site Search. July 29, 2009. Available at: www.nsf.gov/awardsearch/progSearch.do?SearchType=progSearch&page=2&QueryText=&ProgOrganization=SES&ProgOfficer=&ProgEleCode=1371&BooleanElement=true&ProgRefCode=&BooleanRef=true&ProgProgram=&ProgFoaCode=&RestrictActive=on&Search=Search#results.
 - 12 We would like to thank Dr. Kenneth Kolson, formerly of the NEH, for his contributions to this section. The views he expressed are his own and do not necessarily reflect those of the NEH.
 - 13 For example, both the NEH and, as we saw above, the NSF are structured more along conventional disciplinary lines.
 - 14 www.wethepeople.gov.
 - 15 For example, www.neh.gov/projects/index.html.
 - 16 www.neh.gov/grants/digitalhumanities.html.
 - 17 One could imagine, for instance, a junior faculty member in political science developing a research program in some aspect of health policy through the interdisciplinary Robert Wood Johnson Foundation Fellowship program, and going on to support that research project through grants from the NIH. An example of the final product might be the well-regarded, prize-winning, and centrally mainstream political science book by Huber and Shipan (2002). In that book, based on interests from their respective Robert Wood Johnson Fellowship studies, they assess how politicians use laws to shape the administration of public policy, using Medicaid as a primary application.
 - 18 www.personal.umich.edu/~axe/.
 - 19 While much interdisciplinary research—from nanotechnology to finance—both in the U.S. and elsewhere, does not include political science, note that this review emphasizes arenas in which political scientists are typically represented.
 - 20 <http://globalhealth.duke.edu/>.
 - 21 www.povertyactionlab.com/.
 - 22 <http://cisac.stanford.edu/docs/about/>.
 - 23 <http://cisac.stanford.edu/research/>.
 - 24 www.case.edu/med/bioethics/phd.htm.

- 25 See also www.columbia.edu/cu/gsas/departments/sustainable-development/department.html.
- 26 <http://envstudies.brown.edu/dept/info/index.htm>.
- 27 http://www-dcrp.ced.berkeley.edu/Programs/UrbStud_02-03i.htm.
- 28 An early precursor of modern American area studies existed in Europe, of course, in the programs designed to produce competent staff for the various European empires. The School of Oriental and African Studies in London is a case in point.
- 29 www.ed.gov/about/offices/list/ope/iegps/title-six.html.
- 30 www.umich.edu/~iinet/iisite/abtii.html.
- 31 See, for example, Berkeley's similarly organized International and Area Studies: <http://ias.berkeley.edu/general/general.html>.
- 32 See, for example, the Henry R. Luce Initiative in Religion and International Affairs: <http://hluce.org/HLUceInitiative.html>.
- 33 www.uic.edu/las/latamst/about.htm.
- 34 See, for example, Cornell's Africana Studies and Research Center: www.asrc.cornell.edu/default.html.
- 35 www.wellesley.edu/WomenSt/; and www.colorado.edu/EthnicStudies.
- 36 www.uwm.edu/Dept/GLBCert/; and www.princeton.edu/africanamericanstudies/center/requirements/.
- 37 <http://ethnicstudies.berkeley.edu/>; and www.asu.edu/clas/chicana/.
- 38 <http://aaas.duke.edu/aaas/>.
- 39 www.umich.edu/~uminds/.
- 40 www.ahs.uic.edu/dhd/academics/phd_objectives.php.
- 41 www.iq.harvard.edu/Mission.html.
- 42 www.cscs.umich.edu/about/about.html.
- 43 www.iserp.columbia.edu/.
- 44 www.ssri.duke.edu/pariss.php.
- 45 One Task Force member vividly remembers sitting in on a long-ago course at Stanford on decision making that included Lee Hamilton and Amos Tversky from psychology, Kenneth Arrow from economics, and Robert Wilson from GSB, led by Robert Mnookin from law.
- 46 <http://focus.aas.duke.edu/>.
- 47 <http://fds.duke.edu/db/aas/sociology/Markets/>.
- 48 Referred to by one professor as "get out of the way."
- 49 The CSSS at the University of Washington (www.csss.washington.edu) offers the Blalock Fellowship to incoming graduate students who intend to follow one of their Ph.D. tracks. The PARISS program at Duke, (www.ssri.duke.edu/pariss.php), offers fellowships for advanced graduate students, typically those completing their Ph.D.s. Both (and possibly others) use the fellowships to reinforce other aspects of their programs.
- 50 <http://hcvl.hci.iastate.edu/REU>.
- 51 www.unt.edu/policy/UNT_Policy/volume3/16_9.html.
- 52 <http://research.ucsd.edu/orus/#VII>.
- 53 www.provost.umich.edu/faculty/tenure_review/policies.html.
- 54 www.iq.harvard.edu/NewsEvents/ResInProg/Archive.html.
- 55 www.obia.utah.edu/2006Accred/stplans/Strategic_Plan_S05.php.
- 56 www.csbs.utah.edu/strategic_plan.html.
- 57 <http://hum.utah.edu/display.php?pageId=1246>.
- 58 www.yale.edu/isps/programs.